



INDIAN INSTITUTE OF TECHNOLOGY, KANPUR
GT ROAD, KALYANPUR, KANPUR – 208016
UTTAR PRADESH, INDIA

TENDER REFERENCE NO.: IITK/SEE/RJ/SOLAR/2023/01

BID SUBMISSION END DATE- June 13, 2023

TENDER DOCUMENT

For

“Supplying, Installation, Testing, and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur.

INDEX

Name of Work: “Supplying, Installation, Testing, and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur.

Sl. No.	Description	Page
1.	E-Tender Notice	3
2.	Information of e-Tendering for Contractors	4
3.	Bid Document	5
4.	Instructions for Online Bid Submission	6
5.	INSTRUCTION FOR e-PROCUREMENT	9
6.	COMMERCIAL TERMS AND CONDITIONS	15
7.	Tender document	22
8.	TECHNICAL SPECIFICATION	24
9.	TECHNICAL SPECIFICATIONS OF MAJOR EQUIPMENT	33
10.	Tender drawings	36
11.	LIST OF APPROVED MAKES	41
12.	Requirement of Technical Representative	43
13.	QUALITY ASSURANCE OF THE WORK	44
14.	Payment Regulation	46
15.	SPECIAL CONDITION FOR SAFETY AT THE WORK SITE	48
16.	Appendix	50-54

Principal Investigator

Member1

Member2

Department of Sustainable Energy Engineering, IIT Kanpur

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
Department of Sustainable Energy Engineering
E-TENDER NOTICE

NIT No. IITK/SEE/RJ/SOLAR/2023/01

Dated: May 23, 2023

Prof. Rajeev Jindal, SEE-Department, IIT Kanpur on behalf of the Board of Governors of IIT Kanpur invites online item rate tenders from eligible specialized agencies for the following work:-

Sl. No	Name of work and location	Estimated cost put to tender (In Rs.) (including all taxes & GST)	Earnest Money (In Rs.)	Period of Completion (in Month)	Last date & time of submission of tender	Period during which EMD, Cost of Tender Document, e-Tender Processing Fee and Documents shall be submitted	Time & date of opening of tender
1	“Supplying, Installation, Testing, and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building(CESE Building) (100kW)” at IIT Kanpur.		2 Lakhs	3 Months From the date of PO	13.06.2023 (16.00 hrs)	After last date and time of submission of tender and upto 13.06.2023 (16.00 hrs)	14.06.2023 (16.00 hrs)

The E-tender documents is available on <http://eprocure.gov.in/eprocure/app>

Principal Investigator

Copy to:

1. Institute website: www.iitk.ac.in/iwd/tenderhall.htm
2. Notice Board

Information of e-Tendering for Contractors

1. The intending tenderer must read the terms and conditions of FORM-6 for e-Tendering carefully. He should only submit his tender if he considers himself eligible and he is in possession of all the documents required.
2. Information and Instructions for tenderer posted on website shall form part of tender document.
3. The tender document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website <https://eprocure.gov.in/eprocure/app> or www.iitk.ac.in free of cost.
4. But the tender can only be submitted after uploading the mandatory scanned documents as per list given below.
5. Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website.
6. The intending bidder must read the terms and conditions carefully. He should submit his bid only if he considers himself eligible and he is in possession of all the documents as required
7. The intending bidder must upload all the documents as detailed in this tender document.
8. Applicants are advised to keep visiting www.iitk.ac.in/iwd/tenderhall.htm, <http://eprocure.gov.in/eprocure/app>, www.tenderhome.com, and www.eprocure.gov.in/cppp/latestactivetenders, from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.
9. The EMD shall be prepared in favor of “**Registrar IIT Kanpur**” payable at **Kanpur** as detailed in the tender document. A part of EMD is acceptable in the form of bank guarantee as per the details in the tender document. This bank guarantee shall also be in favor of “**Registrar IIT Kanpur**”.
10. The defect liability period is 60 months from the date of handing over the completed building to the Principal Investigator. Other related details are elaborated in the tender document.
11. Site inspection / Pre-Bid meeting, if desired, by the intending bidders will be arranged on **June 5, 2023**, at **10:00 AM**. The intending bidders must reach the O/o the Principal Investigator, Department of Sustainable Energy Engineering, IIT Kanpur -208016. The construction site is inside the IIT Kanpur Campus. The intending bidders shall arrange for the conveyance themselves. Bidders are advised to send their queries/ doubts by email to the Principal Investigator on email id: rajeevj@iitk.ac.in, kchandani@iitk.ac.in at least one day prior to the pre-bid meeting. No further queries after the pre-bid meeting shall be entertained.
12. The indicative drawings are enclosed.

BID DOCUMENT

The Indian Institute of Technology Kanpur (“IITK”) invites Bids (“Bids”) from eligible, qualified, and capable companies for the supply and delivery of “Supplying, Installation, Testing and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur according to the requirements as defined in the Tender document.

Notice Inviting Tender No.	IITK/SEE/RJ/SOLAR/2023/01
Name of Work	“Supplying, Installation, Testing and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹ Diamond Jubilee Academic Complex (DJ Building) (100kW) and ² Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur.
Earnest Money	2,00,000/-
Date of Publishing	23.05.2023 (16.00 hrs)
Clarification Start Date and Time	23.05.2023 (16.00 hrs)
Clarification End Date and Time	09.06.2023 (16.00 hrs)
Queries (if any)	No queries will be entertained after clarification end date and time
Bid Submission Start Date	23.05.2023 (16.00 hrs)
Site inspection / Pre-Bid meeting Date & Time	<u>June 5, 2023</u> at 10:00 AM
Last Date and time of uploading of Bids	13.06.2023 (16.00 hrs)
Last Date and time of submitting , EMD and other documents at IIT Kanpur (if any)	13.06.2023 (16.00 hrs)
Date and time of opening of Technical Bids	14.06.2023 (16.00 hrs)
Date and time of opening of Financial Bids	Will be separately notified for Technically shortlisted/qualified bidders

Interested parties may view and download the tender document containing the detailed terms & conditions from the website <http://eprocure.gov.in/eprocure/app>

(The bids must be submitted online in electronic form on www.eprocure.gov.in only. No physical bids will be accepted.)

Instructions for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: <https://eprocure.gov.in/eprocure/app>.

1 REGISTRATION

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link “**Online bidder Enrolment**” on the CPP Portal which is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC’s to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

2 SEARCHING FOR TENDER DOCUMENTS

- 1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective ‘My Tenders’ folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

3 PREPARATION OF BIDS

- 1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- 2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- 3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing the size of the scanned document.
- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates, etc.) has been provided to the bidders. Bidders can use “My Space” or “Other Important Documents” are available to them to upload such documents. These documents may be directly submitted from the “My Space” area while submitting a bid and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.

4 SUBMISSION OF BIDS

- 1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 3) Bidder has to select the payment option as “offline” to pay the tender fee / EMD as applicable and enter details of the instrument.
- 4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/BC/BG or any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise, the uploaded bid will be rejected.
- 5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white-coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 6) The server time (which is displayed on the bidders’ dashboard) will be considered as the

standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

- 7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 8) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 9) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

5 ASSISTANCE TO BIDDERS

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. The contact number of end user is 0512-259-2323. Please call between 10:30 hrs to 17:00 hrs.
- 2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

INSTRUCTION FOR e-PROCUREMENT

1. PREPARATION AND SUBMISSION OF BIDS:

- a. The detailed tender documents may be downloaded from <http://eprocure.gov.in/eprocure/app> till the last date of submission of the tender. The Tender may be submitted online through CPP Portal <http://eprocure.gov.in/eprocure/app>
- b. The bidder should submit the bid online in two parts viz. Technical Bid and Financial Bid. Technical Bid should be upload online in cover 1 and Financial Bid in “.Xls” should be upload online in cover-2

2. SUBMISSION OF THE BID:

All interested eligible bidders are requested to submit their bids online on CPP Portal: <http://eprocure.gov.in/eprocure/app> as per the criteria given in this document:

- a. Technical Bid should be upload online in cover-1.
- b. Financial Bid should be upload online in cover-2

Both Technical and Financial Bid covers should be placed online on the CPP Portal (<http://eprocure.gov.in/eprocure/app>).

3. TECHNICAL BID: Signed and Scanned copies of the Technical bid documents as under must be submitted online on CPP Portal: <http://eprocure.gov.in/eprocure/app>.

a. List of Documents to be scanned and uploaded (Under Cover-1) within the period of bid submission:-

- Copy of Registration with the Department if any or specialized agencies (MNRE).
- Copy of the documents showing the proof of Original Equipment Manufacturer of the solar PV panels or their authorized dealership/channel partner
- Required experience / completion certificates of similar nature of works.

The works certificates submitted by the bidder clearly indicate that:

1. The completion certificate of the Supply, installation, testing & commissioning of at least single work of 100 kW Capacity roof top solar PV system with on grid tied inverters and associated controls.

2. Actual date/ Time period of completion of the similar work.

- Copy of EPF & ESI No.
- Details of turn over during the last five years.
- Copy of bank solvency certificate.
- Copy of Net worth certificate of minimum Rs. 5 Crore issued by the certified Chartered Accountant.
- Scanned copy of MSME certificate of valid class & category has to be submitted in hard copy. **EMD exemption is allowed for the MSME registered firms** (as on last date of submission of bid) having valid registration of the required class of work.

- Copy of GST Registration.
- Technical data sheets for the major equipments i.e. Solar PV panel, GI-structure, Grid tied inverter etc. and shading report of both locations (using PV syst. Or any equivalent software) as specified in Annexure.
- The tenderer shall have to furnish an affidavit on non-judicial stamp paper of Rs. 10.00 as under:

“I/We undertake and confirm that eligible similar work(s) has /have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the light, then I/we shall be debarred for tendering in IIT Kanpur contracts in future forever. Also, if such a violation comes to light before date start of work, the Principal Investigator shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.”

Note: The hardcopy of earnest money deposit receipt/MSME certificate of valid class & category shall be submitted in the office of Principal Investigator, Department of Sustainable Energy Engineering, IIT Kanpur within last date and time as specified in the above bid document.

- Scanned copy of another document mentioned in the tender document (if any)
- Declaration for local content, Country of Origin of goods, and Bid Security on Appendix 4-5.
 1. For The tender value up to Rs. 10 Crores - Self-Certificate for local content from the bidder.
 2. For the tender value above Rs. 10 Crores – A certificate for local content from Statutory Auditor/Cost Auditor/Cost Accountant/CA.

b. For Import Shipments – Shipping Terms Ex-Works/FOB are preferred.

NOTE - No indication of the rates/amounts be made in any of the documents submitted with the TC-BID.

4. FINANCIAL BID

- a. The currency of all quoted rates shall be Indian Rupees. All payments shall be made in Indian Rupees.
- b. In preparing the financial bids, bidders are expected to take into account the requirements and conditions laid down in this tender document. The financial bids should be uploaded online as per the specified “.Xls” format i.e. Price Bid Excel sheet attached as ‘.Xls’ with the tender and based on the scope of work, service conditions, and other terms of the Tender document. It should include all costs associated with the Terms of Reference/Scope of Work of the assignment.
- c. The Financial Proposal should be inclusive of all applicable taxes, duties, fees, levies, and other charges imposed under the applicable laws. The rates quoted in the Tender are inclusive of all applicable taxes, duties etc. **except service tax**. The service tax component shall be re-immersible by the department after receipt of paid challans etc. if applicable.

5. LAST DATE FOR SUBMISSION OF TENDER:

- a. Online bids complete in all respects, must be submitted on or before the last date and time specified in the schedule of events.

- b. The IIT Kanpur may, at its own discretion, alter/extend the last date for submission of tenders.

6. BID VALIDITY

- a. All the Bids must be valid for a period of 90 days from the last date of submission of the tender for execution of Contract. However, the quoted rates should be valid for the initial/ extended period of the Contract from the effective date of the Contract. No request will be considered for price revision during the original Contract period.
- b. A bid valid for a shorter period shall be declared as non-responsive.
- c. In exceptional circumstances, prior to expiry of the original time limit, the IIT may request the bidders to extend the period of validity for a specified additional period beyond the original validity of 90 days. The request and the bidders' responses shall be made in writing. The bidders, not agreeing for such extensions will be allowed to withdraw their bids without forfeiture of their Bid Security.

7. MODIFICATION / SUBSTITUTION/ WITHDRAWAL OF BIDS:

- a. No Bid shall be modified, substituted or withdrawn by the Bidder after the Bid's due Date.
- b. Any alteration/ modification in the Bid or additional information supplied subsequent to the Bid's due Date, unless the same has been expressly sought for by the Authority, shall be disregarded.

8. REJECTION OF THE BID:

The bid submitted shall become invalid and tender fee shall not be refunded if:-

- a. The bidder is found ineligible.
- b. The bidder does not upload all the documents as stipulated in the bid document.

9. SELECTION CRITERIA:

Phase-I: Technical Evaluation & Sample Approval

Technical evaluation will be done on the basis of information given by technical bid submitted by the bidders. Bid containing partial, incomplete, uncleared and superfluous and unwanted information will be summarily rejected.

Technical declaration must be supported with relevant document. Discrepancy in relevant supporting document and technical compliance sheet shall lead to rejection of technical bids.

Sample Approval:

Bidders should have to display their samples (if asked) on DD.MM.YYYY at the Central Store & Purchase Section of IIT Kanpur. Non-display of sample shall be considered as non-responsive technical bids.

Phase-II

- a. Financial bids of technically qualified and approve samples bidders shall be opened.
- b. Financial evaluation is purely done on the total financial implication.
- c. Any superfluous, unreasonable assets rate quotes will be summarily rejected.

10. Late Delivery/completion of work:

Delivery/work must be completed within the period mentioned in tender document from the date of receipt of the order. Penalty @ 1% per week or part thereof subject to a maximum of 10% of the delivery price will be deducted from the balance payment if supply is not completed within stipulated period.

11. Instruction to the bidder of countries which share land border with India (Rule 144(xi) GFRs)

- I.** Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Department for Promotion of Industry and Internal Trade (DPIIT).
- II.** "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company , including any member of a consortium or joint venture (that is an association of several persons, or firms or companies) , every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III.** "Bidder from a country which shares a land border with India" for the purpose of this Order means: -
 - a.** An entity incorporated, established, or registered in such a country; or
 - b.** A subsidiary of an entity incorporated, established, or registered in such a country; or
 - c.** An entity substantially controlled through entities incorporated, established, or registered in such a country; or
 - d.** An entity whose beneficial owner is situated in such a country; or
 - e.** An Indian (or other) agent of such an entity; or
 - f.** A natural person who is a citizen of such a country; or
 - g.** A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV.** The beneficial owner for the purpose of (iii) above will be as under:
 - 1.** In case of a company or Limited Liability Partnership , the beneficial owner is the natural person(s), who , whether acting alone or together , or through one or more juridical person, has a controlling ownership interest or who exercises control through other means .

Explanation-

- a.** "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company.
- b.** "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.
- 2.** In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
- 3.** In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who , whether acting alone or together , or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals ;
- 4.** Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official.

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
 - V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
 - VI. In case of tenders for Works contracts, including Turnkey contracts, The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.
12. As per the Ministry of Commerce and Industry Order No. P-45021/2/2017-PP(BE-II) dated 04.06.2020 preference shall be given to Make in India products for which it is mandatory for bidders to declare Country of Origin of goods and percentage of Local contents in the product.

Definitions:

“Local Content” means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

“Class-I local supplier” means a supplier or service provider, whose goods, services or works offered for procurement, has local content to or more than 50%, as defined under this order.

“Class-II local supplier” means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under this order.

“Margin of purchase preference” means the maximum extent to which the price quoted by a Class-I local supplier may be above the L1 for the purpose of purchase preference. (shall be 20%)

Purchase Preference:

- (a) Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to ‘Class-I local supplier’ in procurements undertaken by procuring entities in the manner specified here under.
- (b) In the procurements of goods or works, which are covered by para 3(b) above and which are divisible in nature, the Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:
 - i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is Class local supplier', the contract for full quantity will be awarded to L1.
 - ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered

- on Class-1 local suppliers, then such balance quantity may also be ordered on the L1 bidder.
- (c) In the procurements of goods or works, which are covered by para 3(b) above and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-1 local supplier' shall get purchase preference over 'Class-1 local supplier' as well as 'Non-local supplier', as per following procedure:
- i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-1 local supplier', the contract will be awarded to L1.
 - ii. If L1 is not 'Class-1 local supplier', the lowest bidder among the 'Class-1 local supplier', will be invited to match the L1 price subject to Class-1 local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-1 local supplier' subject to matching the L1 price.
 - iii. In case such lowest eligible 'Class-1 local supplier' fails to match the L1 price, the 'Class-1 local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-1 local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.
- (d) "Class-II local supplier" will not get purchase preference in any procurement, undertaken by procuring entities.

COMMERCIAL TERMS AND CONDITIONS

1. DEFINITIONS

These Commercial Terms and Conditions shall constitute the General Conditions of Contract, where no separate contract is signed with the selected Bidder(s), and, the Bidders by putting their signature and stamp on each page of this Section V are binding themselves to these Terms and Conditions. In the Commercial Terms and Conditions as defined below, words and expressions shall have the following meanings assigned to them:

- a. "Contract" means the agreement of the Parties relating to the procurement of Goods and / or the IITK Purchase Order (PO), and all attachments incorporated by reference, which shall form an integral part of the Contract. In the event of any discrepancy, the documents to prevail shall be given precedence in the following order: (i) the Contract (where separately signed), (ii) the IITK Purchase Order, (iii) its attachments, and (iv) these Commercial Terms and Conditions.
- b. "Contractor" means the person or entity named in the 'CONTRACTOR' named field of the IITK Purchase Order and any agreed in writing by the IITK legal successor(s) in title;
- c. "Day" means any calendar day;
- d. "Delivery Date" means the latest possible date by which the Goods shall be delivered by the Contractor to the IITK, as specified in the 'DELIVERY DATE' named field of the IITK Purchase Order;
- e. "Force Majeure" shall mean any unforeseeable exceptional situation or event beyond the Parties' control which prevents either of them from fulfilling any of their obligations under the Contract, was not attributable to error or negligence on their part (or of their partners, contractors, agents or employees), and could not have been avoided by the exercise of due diligence. Defects in equipment or material or delays in making them available, labour disputes, strikes or financial problems cannot be invoked as Force Majeure by the defaulting Party. Neither of the Parties shall be held liable for breach of its obligations under the Contract if it is prevented from fulfilling them by Force Majeure. The Party invoking Force Majeure shall notify the other without delay, stating the nature, likely duration and foreseeable effect, and take any measure to minimise possible damage;
- f. "Goods" means all of the goods/works to be supplied to the IITK by the Contractor under the Contract;
- g. "IITK" means the Indian Institute of Technology Kanpur;
- h. "IITK Purchase Order" means the IITK's official Purchase Order document;
 - (i) "Party" means the IITK or the Contractor and "Parties" means the IITK and the Contractor; and
 - (ii) "Place(s) of Delivery" means the location(s) or place(s) where the Goods are to be delivered, as specified in the 'SHIP TO' named field of the IITK Purchase Order.

2. CONCLUSION OF THE CONTRACT

- 2.1. The Contract is made between the IITK and the Contractor. The Contractor is engaged as an independent contractor for the sole purpose of delivering the Goods.
- 2.2. The Contract shall be concluded upon the Contractor duly following the countersigning procedure as stated in the IITK Letter of Intent (LOI).

3. FUNDING

This Contract shall become and remain effective only on the condition that an official Purchase Order is issued by IITK following the conclusion of tender exercise. In the event this is not or no longer shall the case, the IITK without unreasonable delay notify the Contractor thereof.

Any continuation of the Contractor's performance under this Contract after being notified by the IITK shall be at the Contractor's risk and expense.

4. DELIVERY AND TAKE-OVER OF GOODS

The Contractor shall deliver the Goods at the Place(s) of Delivery. On behalf of the IITK, a duly authorised representative(s), shall take-over the Goods upon delivery. Take-over of the Goods by the IITK shall not be deemed acceptance of the Goods by the IITK. The time of delivery as specified in the Contract / PO shall be strictly adhered to, and time shall be of the essence.

5. QUALITY OF GOODS

5.1. The Contractor shall deliver Goods that are:

- a. of the quality, quantity and description as required by the Contract / PO; and
- b. free from any right or claim of a third party, including rights based on industrial property or other intellectual property.

5.2. Should the Goods be of the type "homogeneously defined" or disposable, the Contractor shall provide a sample and undertake, certify, and guarantee that all Goods delivered shall be of the same quality and characteristics as the sample(s) provided.

6. INSPECTION AND ACCEPTANCE

6.1. The duly authorised representative(s) of the IITK shall have the right, before payment, to inspect the Goods & work either at the Contractor's stores, during manufacture, at the ports and/or in places of shipment, or at the Place(s) of Delivery. The Contractor shall provide all facilities for such inspection. The IITK may issue a written waiver of inspection. Any inspection carried out by representative(s) of the IITK or any waiver thereof shall be without prejudice to other provisions of the Contract concerning obligations assumed by the Contractor, including specifications of the Goods.

6.2. Upon delivery and inspection of the Goods, the IITK shall inspect the goods as soon as possible and complete the Goods Receiving Document. Should any Goods fail to conform to the technical specifications, codes and standards under the Contract, the IITK may reject the Goods. The Contractor shall, at no cost to the IITK, replace the rejected Goods or, alternatively, rectify the non-conformity.

6.3. In the case of Goods ordered on the basis of specifications or samples, the IITK shall have the right to reject the Goods or any part thereof and terminate the Contract if the Goods do not conform to the specifications and/or samples. Nothing in this clause shall in any way release the Contractor from any warranty or other obligations under the Contract.

7. SHIPPING AND INSURANCE

For overseas orders, shipping arrangements shall be co-ordinated by IITK. Original shipping documents including the packing list shall be airmailed/mailed by the Contractor to the (Assistant Registrar (S&P), IIT, Kanpur – 208 016, UP, India).

8. OBSERVANCE OF LAW AND EXPORT LICENCES

The Contractor shall comply with all laws, ordinance, rules and regulations bearing upon the performance of its obligations under the terms of the Contract. If an export licence or any other governmental authorisation is required for the Goods, it shall be the obligation of the Contractor to obtain such licence or governmental authorisation. In the event of the Contractor's failure to obtain such licence or authorisation within a reasonable time, the IITK may immediately terminate the Contract. Where the award procedure or execution of the Contract is vitiated by substantial errors or irregularities or by fraud, the IITK shall suspend execution of the Contract.

Where such errors, irregularities or fraud are attributable to the Contractor, the IITK may also refuse to make payments or may recover monies already paid, in proportion to the seriousness of the errors, irregularities or fraud. The purpose of suspending the Contract shall be to verify whether presumed substantial errors and irregularities or fraud have actually occurred. If they are not confirmed, execution of the Contract shall resume as soon as possible. A substantial error or irregularity shall be any infringement of a contract or regulatory provision of India, resulting from an act or an omission that causes or might cause a financial loss.

9. PRICE

The price of the Goods shall be as stated in the Purchase Order and may not be increased.

10. PAYMENT *(for details refer quality assurance section)*

- 10.1.** Unless otherwise stipulated in the Purchase Order, the IITK shall make payment within thirty (30) Days of the later of:
 - a.** Successful delivery of the goods to IITK as confirmed by the consignee (Assistant Registrar, Store & Purchase, IIT-Kanpur), endorsed by the indenter and approved by the indenters' Head of Department / Section;
 - b.** Receipt of customary shipping documents and any other documents specified in the Contract; and (c) Receipt of the original invoice issued by the Contractor.
- 10.2.** All invoices shall be in original and shall contain the IITK Purchase Order number, and a description, the quantities, unit and total price(s) of the Goods delivered. The currency of invoice and payment shall be as specified in the Purchase Order. Unless otherwise authorised by the IITK, a separate invoice shall be submitted for each shipment under the Contract / PO. Subject to Clause 11 below ('Tax Exemption'), if applicable, the GST amount shall be separately identified in the invoice.
- 10.3.** Payments shall be made in the currency stated in the Contract / PO, on the basis of the equivalent value of INR on the day of payment and paid directly into the nominated bank account.
- 10.4.** The IITK shall not pay any charge for late payments.

11. TAX EXEMPTION

The Contractor's price shall reflect any tax exemption to which the IITK is entitled. If it is subsequently determined that any taxes that have been included in the price are not required to be paid or if, having been paid, any such taxes are subject to refunding, the IITK shall deduct the amount from the Contract price. Payment of such adjusted amount shall constitute full payment by the IITK. In the event that any taxing authority refuses to recognize the IITK's exemption from taxes, the Contractor shall immediately consult with the IITK to determine a mutually acceptable procedure for settling the applicable amount.

12. WARRANTY

- 12.1.** The Contractor warrants that the Goods & work furnished under the Contract conform to the technical specifications, description and standards specified in the Contract, and are new and unused, and free from defects in design, workmanship and/or materials.
- 12.2.** The Contractor shall provide a warranty for the Goods & work for a period of ~~one year~~ from the date of acceptance of the Goods by the IITK, unless the standard manufacturer's warranty period is longer in which case the longer period shall apply. *(As mentioned in Technical Specification)*
- 12.3.** In the case of "homogeneously defined" or disposable goods, should any portion of the Goods, at any time, not comply with clause 5.1 or 5.2 herein or otherwise prove to be defective, the Contractor shall, upon written notification from the IITK, replace that portion of the Goods and bear all costs associated with the replacement of same.

13. PACKING

- 13.1.** The Goods shall be packed and marked in a proper manner and in accordance with the Contract and any statutory requirements and any requirements of the carrier(s). In particular, the Goods shall be marked with the IITK Purchase Order number and the net, gross and tare weights, the name of the contents shall be clearly marked on each container and all containers of hazardous goods (and all documents relating thereto) shall bear prominent and adequate warnings.
- 13.2.** The Contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination. The packing shall be sufficient to withstand, without limitation, rough handling during transit. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination and the absence of appropriate handling facilities at all points in transit.
- 13.3.** All packaging materials shall be non-returnable.

14. DEFAULT AND DAMAGES

- 14.1.** If due to reasons attributable to the Contractor, the Contractor fails or refuses to:
 - a.** deliver any or all of the Goods under the Purchase Order;
 - b.** comply with any or all of the terms and conditions set out in the Purchase Order; or
 - c.** Deliver any or all of the Goods under the Purchase Order on or before the Delivery Date; the IITK may hold the Contractor in default under the Purchase Order.
- 14.2.** When the Contractor is thus in default, the IITK may, by written notice to the Contractor, immediately terminate the Purchase Order in whole or in such part or parts thereof in respect of which the Contractor is in default.
- 14.3.** Alternatively, to clause 14 above when the Contractor is thus in default, the IITK may, at its own discretion, set a reasonable period of time for the Contractor to remedy its default. Any new Delivery Date shall be specified in a written amendment to the Purchase Order, duly countersigned by the Contractor.
- 14.4.** The IITK may, at its discretion, impose penalties upon the Contractor calculated in accordance with clause 15 for each Day the Contractor is late in delivering the Goods past the Delivery Date initially specified in the Purchase Order.
- 14.5.** If the Contractor does not remedy its default within the period of time accorded under clause 16, the IITK may, by written notice to the Contractor, terminate the Purchase Order with immediate effect.
- 14.6.** Upon any termination of the Purchase Order, in whole or such part(s) thereof in respect of which the Contractor is in default, the IITK may engage another contractor to deliver the Goods and recover any difference in price and any additional costs from the Contractor.
- 14.7.** The Contractor shall indemnify the IITK for all losses, charges, costs and expenses, which the IITK may suffer or incur as a result the Contractor's default, including those resulting from engaging another contractor pursuant to this clause 14.

15. PENALTIES

If, in accordance with clause 15, the IITK imposes penalties on the Contractor, such penalties shall amount to One percent (1%) of the total Purchase Order price for each week following the initial Delivery Date specified in the Purchase Order but shall not amount to more than Ten percent (10%) of the total Purchase Order value. The penalties for the delay may be deducted by IITK from any sum(s) due, or to become due, by the IITK to the Contractor.

16. DELAY NOT ATTRIBUTABLE TO THE CONTRACTOR

If the Contractor is delayed at any time in the delivery of the Goods or fulfilment of any other of the Contractor's obligations by any act or omission of the IITK, or by any of its officials, or by any separate contractor(s) contracted by the IITK, or by changes ordered in the type and/or quantity of the ordered Goods, or the Place(s) of Delivery, or any causes beyond the Contractor's reasonable control, or by any other cause, which the IITK determines may reasonably justify the delay, the Delivery Date of the Goods, or fulfilment of any other of the Contractor's applicable obligations shall be extended for such reasonable period of time as the IITK and the Contractor mutually determine. The set reasonable period of time and any amended delivery date shall be specified in a written amendment to the Contract / PO, duly countersigned by the Contractor.

17. FORCE MAJEURE

As soon as possible after the occurrence of any event constituting Force Majeure, but no later than three (3) Days, the Contractor shall give notice and full particulars in writing to the IITK of the Force Majeure. If the Contractor is thereby rendered unable, wholly or in part, to meet its obligations under the Contract, the IITK may terminate the Contract / PO with immediate effect by providing written notice to the Contractor.

18. INDEMNITY

- 18.1.** The Contractor shall indemnify, hold and save harmless and defend at its own expense the IITK, and all of the foregoing's officials, agents, servants and employees from and against all suits, claims, demands and liability of any nature or kind, including costs and expenses, arising out of acts or omissions of the Contractor or its employees, agents or subcontractors in the performance of the Contract.
- 18.2.** Clause 18 shall include, without limitation, claims and liabilities in the nature of workmen's compensation and claims and liabilities arising out of the use of patented inventions or devices.

19. ASSIGNMENT

- 19.1.** The Contractor shall not assign, transfer, pledge or make other disposition of the Purchase Order or any part thereof or of any of the Contractor's rights, claims or obligations under the Purchase Order except with the express written consent of the IITK. Any assignment made without such consent shall be void and of no effect.
- 19.2.** The Contractor shall not subcontract any of its obligations under the Contract / PO without the express written consent of the IITK. The IITK may require the Contractor to furnish particulars of the proposed subcontract as the IITK deems necessary.
- 19.3.** The IITK's approval of any subcontracting shall not relieve the Contractor from any liability or obligation under the Contract. In any subcontract, the Contractor agrees to bind the subcontractor by the same terms and conditions by which the Contractor is bound under the Contract / PO.

20. INSOLVENCY AND BANKRUPTCY

- 20.1.** Should the Contractor become insolvent or should control of the Contractor change by virtue of insolvency, the IITK may with immediate effect and without prejudice to any other right or remedy available to it, suspend the performance of the Contractor's obligations or terminate the Purchase Order with immediate effect, by providing the Contractor with written notice thereof.

20.2. Should the Contractor be adjudged bankrupt, or should the Contractor make a general assignment for the benefit of its creditors, or should a receiver be appointed on account of the Contractor's insolvency, the IITK may, without prejudice to any other right or remedy available to it, terminate the Purchase Order with immediate effect by providing the Contractor with written notice thereof.

21. TERMINATION

21.1. The IITK shall have the right to terminate the Purchase Order or any of the provisions thereof at any time by serving a three days' notice to the Contractor.

22. WAIVER

A waiver of any breach of or default under the Contract / PO shall not constitute a waiver of any other breach or default and shall not affect the other terms of the Contract / PO. The rights and remedies provided by the Purchase Order are cumulative and are not exclusive of any other rights or remedies.

23. ADVERTISING

The Contractor shall not advertise or otherwise make public the fact that it is a contractor to the IITK. The Contractor shall not in any way use the name, emblem, logo, official seal, or any abbreviation of the IITK.

24. DISCRETION AND CONFIDENTIALITY

The Contractor is required to exercise the utmost discretion in all matters relating to the Contract / Purchase Order. Unless required in connection with the performance of the Purchase Order or expressly authorised in writing by the IITK, the Contractor shall not disclose at any time to any third party any information which has not been made public and which is known to the Contractor by reason of its association with the IITK. The Contractor shall not, at any time, use such information to any private advantage. These obligations do not lapse upon any completion, expiration, cancellation or termination of the Contract / PO.

25. NOTICES

Any notice given in connection with the Contract shall be given in English and in writing and shall be deemed to be validly given if sent by registered mail or by fax or by email to the other Party at the following:

- a.** for the IITK: the contact details set out in the 'IITK BUYER' name field of the Purchase Order; and
- b.** for the Contractor: the contact details set out in the 'CONTRACTOR' named field of the IITK Contract/Purchase Order.

26. STAFF MEMBERS NOT TO BENEFIT

The Contractor shall not grant to any official of the IITK any direct or indirect benefit or preferential treatment on the basis of the Purchase Order or the award thereof. Any breach of this provision shall constitute a fundamental breach of the Purchase Order.

27. GOVERNING LAW

The Contract shall be governed by and construed in accordance with the substantive laws of the Republic of India.

28. SETTLEMENT OF DISPUTES

28.1. The Parties shall use their best efforts to negotiate and amicably settle any disputes, controversies or claims arising out of, or in connection with, the Contract / Purchase Order or its interpretation.

28.2. If the Parties fail to settle the dispute amicably within thirty (30) Days of commencement of the negotiations, the dispute shall be settled through arbitration. One (1) sole arbitrator shall be appointed by the Director of IITK who shall have full powers to make final and binding decisions subject to prevailing laws of India. The appointing authority shall be the Director of IITK. The place of arbitration shall be Kanpur and the language used in the arbitration proceedings shall be English.

29. PRIVILEGES AND IMMUNITIES

No provision of the Contract / Purchase Order shall be deemed, or interpreted as, a waiver of the privileges and immunities enjoyed by the IITK.

30. AMENDMENTS

No modification, amendment or change to the Contract/Purchase Order, or waiver of any of its provisions, or any additional contractual relationship with the Contractor shall be valid unless approved in the form of a written amendment to the Contract/Purchase Order, signed by a fully authorised representative of each Party.

31. VALIDITY

The invalidity in whole or part of any condition of the Contract / Purchase Order or clause thereof shall not affect the validity of the remainder of such condition or clause.

32. ENTIRE AGREEMENT

The Contract / Purchase Order constitute the entire agreement and understanding of the Parties and supersede any previous agreement, whether orally or in writing, between the Parties relating to the subject matter of the Contract.

33. GOVERNING LANGUAGE

The Contract / Purchase Order shall be executed in the English language which shall be the binding and controlling language for all matters relating to the meaning and interpretation of the Contract / Purchase Order.

Tender document

NIT No.: IITK/SEE/RJ/SOLAR/2023/01

Dated: May 23, 2023

Tender for : “Supplying, Installation, Testing, and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur.

Location 1 Google map Link: <https://goo.gl/maps/VCKriryofxRDCWwy7>

Location 2 Google map Link: <https://goo.gl/maps/fBqcyoxLn4Z4sLdQ6>

Online quotations are invited for: “Supplying, Installation, Testing, and Commissioning of grid-connected 200 kW rooftop solar PV plant on the terrace of ¹Diamond Jubilee Academic Complex (DJ Building) (100kW) and ²Centre for Environmental Science & Engineering Building (CESE Building) (100kW)” at IIT Kanpur.

Initial Eligibility & Technical Criteria:

- I. **Joint ventures are not accepted.** The bidders satisfying the initial eligibility & Technical criteria shall only be considered for financial bid opening.
- II. Vendor/OEM should be MNRE approved.
- III. Vendor shall have done some similar work for Central Government / State Government / Central Autonomous Body / Central PSUs with 3 (three) similar completed works costing not less than *Rs. 40 Lakhs (INR)* or 2 (two) similar completed works, not less than *Rs 55 Lakhs* or 1 (one) similar completed work of aggregate cost not less than *Rs. 85 Lakhs*.
Note: - The similar nature works means experience of Supply, installation, testing & commissioning of roof top solar PV system with grid tied inverter and associated controls.
- IV. Should have average annual financial turnover of **Rs. 5 crore** of similar works during any three financial years in the last 5 financial years ending 31-03-2023.
- V. Should not have incurred any loss in more than two years during the last five years ending 31-03-2023.
- VI. Should have valid registration of ESIC and GST.
- VII. The time allowed for carrying out the work will be 3 Months from the date of Purchase Order, whichever is later, in accordance with the phasing, if any, indicated in the tender documents.
- VIII. The site for the work is available for execution of the works.
- IX. Intending Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the terrace/ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall

themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderers shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed.

- X. The principal investigator (PI), IIT Kanpur does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderers shall be summarily rejected.
- XI. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.
- XII. Entire work under the scope of composite tender including major and all minor components shall be executed under one agreement.
- XIII. Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works. The Earnest Money will become part of the security deposit of the major components of work.

****IIT Kanpur holds the right to modify/cancel the tender****

Principal Investigator

TECHNICAL SPECIFICATION

Section 1: Solar PV Panels

Section 2: Inverters

Section 3: Electrical Works

SECTION 1 : SOLAR PV PANEL

1. The SPV array generally consisting of number of SPV modules that directly produces DC electricity power on receipt of solar radiation. This DC power is converted to AC power by inverter. The AC output of 200 kWp solar plant at 415 V level will work in combination with IITK grid, feed existing LT system at Diamond Jubilee Academic Complex (DJ Building) and Centre for Environmental Science & Engineering Building LT panels at these two locations. Modules may be connected in series or parallel to increase the voltage and current and to achieve the required solar array characteristics that will match the load.
2. Solar PV modules/Panels should be mono-PERC/TopCon or equivalent cells shall have high efficiency and to be of Indian origin (cells of the panel may be overseas made).
3. The Stabilized output of solar Power plant shall be 200 kWp DC after One year. The bidder shall demonstrate the capacity of plant after One year from the date of commissioning of plant and shall also be part of guarantee. The security deposit shall be released only after the testing results are found satisfactory. The bidder shall use adequate capacity of SPV module, Inverter, Junction boxes etc. to ensure generation of power as per design estimates. This is to be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of Inverter etc. The output at Inverters (s) will be considered for verification purpose. Bidder shall indicate procedure and details of software or formula for demonstration of capacity of plant in tender itself. For other purpose the meter reading will be considered.
 - a) Selection of the equipment and adoption of a plant layout to ensure ease of maintenance.
 - b) Ripple content must not exceed 3% on DC side.
 - c) Shading losses should be less than 2%.
 - d) **The power plant shall operate in parallel with the grid system which is infinite electrical system. Any faults not taken care will result in damage of only SPV power plant without effecting IIT Kanpur grid infinite system. Thus the Solar Power Plant has to protect its equipment against any of possible fault or other disturbances from the grid.**
4. The basic and detailed engineering of the plant will aim at achieving high standards of operational performance especially considering following:
 - a) Optimum availability of modules during the day time.
 - b) Ensuring module layout to prevent shading.

- c) Selection of Inverter with high track record and readily availability of requisite spares.
- d) Flat plate arrays are held fixed at a tilted angle and face towards the equator. The angle of tilt should be approximately equal to the angle of latitude for the site. A steeper angle increases the output in winter: while a shallower angle, more output in summer. It should be arranged in such a manner that optimize generation is achieved.
- e) Based on the Solar insolation data, the solar PV system should be so designed that it shall take into account the mean energy output after allowing for various losses, temperature correction, on an average day for each month of the year.

1. Solar PV Module Specifications:

- 1.1. The equipment and material for 200 kWp Solar Photovoltaic Power Plant with associate system (typical) shall include following but not be limited to the following: (Only The technical features of major equipment's are described here under).
- 1.2. SPV Mono- PERC / TopCon or equivalent modules to be supplied, shall have declared output of **500-550 Watt peak**. The number of modules to be supplied will be as per calculation.
- 1.3. Stabilized output of the Solar Power Plant should not be less than 200 kWp under Standard Test Condition after one year of operation from date of Commissioning of solar plant.
- 1.4. SPV modules should be *PID free (PID certified)*.
- 1.5. Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture & provide high voltage electrical insulation.
- 1.6. The module frame shall be made of hot dipped Galvanized (at least 85 microns) iron for mounting the PV modules. The thickness of section should not be less than 2 new. The legs / columns of the structure shall be self-supported/ standing. The supports shall be design to given required orientation to take maximum ionization, absorb and transfer the mechanical loads to the ground properly.
- 1.7. SPV module shall contain Mono crystalline high power silicon solar cells. The solar cell shall have surface anti-reflective coating to help to absorb more light in all weather conditions (latest technology).
- 1.8. The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells front the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing during entire life of the solar modules. Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided. The module frame shall be made of corrosion resistant materials having anodized aluminum or as per manufacturer standard.

- 1.9. Photo conversion efficiency of SPV Module should be greater than 20.5%. Module shall be made of high transmittance glass front surface giving high encapsulation gain.
- 1.10. Module rating is considered under standard test conditions, however Solar Modules shall be designed to operate and perform under site condition including high temperature & dust (sometimes).
- 1.11. All materials used shall be having a proven history of reliable, light weight and stable operation in external outdoor applications.
- 1.12. Solar PV Module design shall conform to following requirement: a. Weather proof DC rated MC connector and a lead cable coming out as a part of the module, making connections easier and secure. not allowing for any loose connections.
- 1.13. Resistant of water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.
- 1.14. Other general requirement for the PV modules and subsystems shall be the Following:
- 1.15. The rated output power of any supplied module shall have tolerance of 3% (three percent).
- 1.16. 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.
- 1.17. The module shall be provided with a junction box with weather proof lid of sealed type and IP-65/66/67 rated.
- 1.18. Warranties: The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and not less than 80% at the end of 27 years.
- 1.19. Each PV module used in any solar plant shall use a RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.
 - 1.19.1. Name of the manufacturer of PV module
 - 1.19.2. Name of the manufacturer of Solar cells
 - 1.19.3. Month and year of the manufacturer (Separately for Solar cell and module)
 - 1.19.4. Country of origin (Separately for Solar cell and module)
 - 1.19.5. I-V curve for the module
 - 1.19.6. Wattage, I_{sc} , V_m and FF for the module
 - 1.19.7. Unique Serial No and Model No of the module
 - 1.19.8. Date and year obtaining IEC PV module qualification certificate
 - 1.19.9. Name of the test lab issuing IEC certificate
 - 1.19.10. Other relevant information on traceability of Solar cell and module as per ISO 9001 & ISO 14001.

2. MODULE MOUNTING STRUCTURE (FIXED):

1. MS Galvanized mounting structure cold formed members 2mm (or more) thick with galvanizing coating of 85 microns is to be used as per requirements of this project and maximum nos. of modules is to be installed in min. area.
2. The structure design shall be appropriate and innovative and corrosion resistant and electronically compatible with the materials used in the module frame, its fasteners, nut and bolts. The bidder may choose to offer module mounting structure as per their design fulfilling the detailed in NIT and shall be capable of withstanding **wind speed of 180 kmph**.
3. The module alignment & tilt angle shall be calculated to provide the maximum annual energy output to take maximum insulation. This shall be decided based on the location of array installation (around 25 degree).
4. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. Structure shall be supplied complete with all members to be compatible for allowing easy installation at the rooftop site.
5. Height of the Structure at location 1 (Diamond Jubilee Academic Complex (DJ Building)) should be 5feet (minimum) from the roof surface, whereas the location 2 (Centre for Environmental Science & Engineering Building) will depend.
6. The rooftop mounted structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly. It should be less than 60 kg/m². The overall load including solar PV panel shall not be greater than 100 kg/m².
7. The mounting steel structure shall be as per latest BIS 2062 (amended up to date) and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date).The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time and the minimum clearance of the structure from the roof level should be 2100 mm. Adequate spacing shall be provided between any two modules secured on PV panel for improved wind resistance. The structure shall be designed to withstand operating environmental conditions for a period of minimum 30 years.
8. All fasteners, nut and bolts are made of Stainless steel - SS 304. (1 bolt+2 plain washer+ 1 spring washer+ 1 nut all hot dipped galvanized. *The structure shall be strengthened by PCC foundation cubes/block at location 1 (Diamond Jubilee Academic Complex (DJ Building)) and Location 2 (Centre for Environmental Science & Engineering Building) should have faster based structure on the beams (already there).*
9. The array structure shall be grounded properly as per industrial standards.

3. ARRAY JUNCTION BOXES/(DCDB):

- a) The junction box shall be dust free, vermin, and waterproof for outdoor application IP 65/66/67 and made of Thermoplastic / Polycarbonate material.
- b) The terminal will be connected to copper bus-bar arrangement of proper size to be provided with terminal blocks should be housed in the junction box with suitable termination threads Conforming to IP65/66/67 standard. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.
- c) Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- d) Each array junction Box will have suitable Reverse Blocking Diodes(2 Nos. Each) of maximum DC blocking voltage of minimum 600 V with suitable arrangement for its connecting.
- e) The array junction Box will also have suitable surge protection device. Hinged door should be used with EPDM rubber gasket to prevent water entry.
- f) The junction Boxes shall have suitable arrangement for the followings (typical):
 - I. Combine groups of modules into independent charging sub-arrays.
 - II. Provide arrangement for disconnection of each of the groups.
 - III. Provide a test point for each sub-group for quick fault location.
 - IV. To provide group array isolation.
 - V. The current carrying ratings of the junction Boxes shall be suitable with adequate safety factor, to inter connect the Solar PV system corresponding to 200 kWp.

SECTION 2: SOLAR INVERTER

1. Solar inverter shall be grid interactive in nature and mainly consist of dual MPPT (with Multiple string inputs) controller, inverter of rating 20 to 50 kWp, 3 phase, 415 V, IP 65/66/67 each, associated control and protection devices etc. all integrated. It shall provide necessary protections for Grid Synchronization and Data Logging/Monitoring . The inverter shall have communication protocol RS485 over Modbus / Ethernet / Wi-Fi for remote monitoring. The inverter should convert DC power produced by the PV modules into AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid.
2. Inverters should be PID enabled.
3. The DC energy produced shall be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provide 3-ph, 415V AC (-10% to +15%), 50+/- 3% Hz. to synchronize with the grid.
 - a) The inverter shall be of very high quality having efficiency not less than 98%

and shall be capable of running in integrated mode.

- b) Degree of protection of the inverter shall be at least IP-65/66/67 for outdoor. Logged data must be directly accessible to IIT Kanpur and made available to the internal designated data servers. In any circumstance no process or performance data acquired through any data acquisition component of the installation shall be routed through vendor website or any data server external to IIT Kanpur. This clause must be strictly enforced.
- c) The inverter shall be designed for continuous, reliable power supply as per specification.
- d) The inverter shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently & automatically.
- e) Both AC & DC lines shall have suitable fuses/MCB/MCCBs Metal Oxide Arrestors/surge arrestors and contactors to allow safe start up and shut down of the system. Fuses/MCB/MCCBs used in the DC circuit should be DC rated.
- f) The inverter shall operate in sleeping mode when there will be no power connected.
- g) The following Protections must be included and operational at all times of inverter operation
 - I. Over voltage both at input & output.
 - II. Over current both at input & output.
 - III. Over/under grid frequency.
 - IV. Heat sink over temperature.
 - V. Short circuit.
 - VI. Protection against lightning.
 - VII. Surge arrestors to protect against Surge voltage induced at output due to external source.
 - VIII. Any other protection in view of grid supply.
 - IX. Anti - Islanding Protection.
 - X. Fault ride through feature.
- h) It should have user friendly LED/LCD display for programming and viewing on line parameters such as:-
 - I. Inverter per phase Voltage, current, kW, kVA and frequency,
 - II. Grid Voltage and frequency,
 - III. inverter (Grid) on Line status,
 - IV. PV panel voltage,
 - V. Solar charge current and ambient temperature,
 - VI. Grid on
 - VII. inverter under voltage/over voltage

- VIII. inverter over load
 - IX. inverter over temperature.
- i) The inverter shall have arrangement for adjusting DC input current and should trip against sustained fault downstream and shall not start till the fault is rectified.
 - j) The inverter shall be able to withstand an unbalanced load conforming to relevant IEC standard and Indian electricity condition. The inverter shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in the event of inverter component failure or from parameters — beyond the safe operating range due to internal or external causes. The self-protective features shall not allow signals from the inverter front panel to cause the inverter to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the inverter, including commutation feature, shall be cleared by the inverter protective devices and not by the existing site utility grid service circuit breaker.
 - k) The inverter shall go to shutdown/standby mode with its contacts open under the following conditions before attempting an automatic restart after an appropriate time delay.
 - l) When the power available from the PV array is insufficient to supply the losses of the inverter, the inverter shall go to standby/shutdown mode.
 - m) The inverter control shall prevent excessive cycling of shut down during insufficient solar radiance.
 - n) Operation outside the limits of power quality should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are
 - I. Neutral voltage displacement
 - II. Over current
 - III. Earth fault
 - IV. Reverse power
 - o) In each of the above cases, tripping time should be sufficiently small to avoid damage to the inverter including all of its components and accessories.
 - p) The Bidder shall provide data sheet for inverter along with their offer as per Guaranteed Technical Particular.
 - q) Inverter shall be tested from the test centres / NABL / BIS / IEC accredited testing & calibration laboratories.

SECTION 3: Electrical Works

1. AC DISTRIBUTION BOARD (ACDB)

- a) The AC power output of the inverter shall be fed to the ACDB (metering panel & isolation panel) which also houses energy meter. The 4 UV AC output of the isolation panel shall be fed to the grid. AC energy is then synchronized with the grid and power is consumed by the grid.

- b) ACDB shall be floor mounted type and shall have all the measuring instruments such as voltmeter, ammeter, frequency meter, energy meter , for measuring the deliverable unit , kWh , selector switches etc as per specification.
- c) All the power cables shall be taken though top/ Bottom of the panel as per site requirement.
- d) The ACDB shall be fitted with suitable rating & size copper bus, MCCB, indicators for all incomer and outgoing terminals, LED, Multi-function meter to monitor & measure the power to be evacuated.
- e) Nuts & bolts and all metallic parts shall have to be adequately protected against atmosphere and weather prevailing in the area.
- f) Modifications/ addition if any, in existing LT panel shall be done at site for connection the supply ACDB and covered in scope of Bidder.

2. WIRING

All instruments and panel wiring shall be of heat resisting and extinguishing type in compliance with IS. Plastic or porcelain cleats of the limited compression type shall be used for holding wiring runs. All wires shall be suitable for bending to meet the terminal studs at right angles. Metal cases of all apparatus mounted on panels shall be separately earthed.

3. CABLE ACCESSORIES

- a) All the wires/cables (whatever if) should be of Copper, unless mentioned specifically.
- b) Only terminal cable Joints shall be accepted. No cable Joints to Join two cable ends shall be accepted.
- c) Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles. The panels bottoms should be properly sealed to prevent entry of snakes/lizard etc. inside the panel.
- d) The terminal end of cables and wires are to be fitted with good quality numbered ferrules of proper sizes so that the cables can be identified easily.
- e) All the wires/cables should be properly hinged (No hanging wire is permissible).

4. EARTHING

- a) Earthing should be in accordance with the total power capacity of the plant i.e. 100Kw each.
- b) Each array structure of the SPV shall be earthed properly. The array structure are to be connected to earth pits as per Industrial standard. Junction boxes shall be connected to the main Earthing conductor/ electrode.
- c) Earthing system installation shall be in strict accordance with the Indian

Electricity Act 2003 upto date.

- d) Necessary Test Point provision shall be made for bolted isolating joints of each Earthing pit for periodic checking of earth resistance.
- e) Earth resistance of the earth pits shall be tested in presence of the representative of Principal Investigator or Nominee.

5. LIGHTNING (LA) & OVER VOLTAGE PROTECTION

- a) L.A. should be in accordance with the total power capacity of the plant i.e. 100kW each.
- b) The PV Power Plant should be provided with Lightning Arrester and over voltage protection connected to proper earth system. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.
- c) The lightning system / Conductors shall be made as per applicable Indian industrial standard.

6. POWER CABLING (refer SLD diagram)

- a) The power cables shall be XLPE insulated, PVC outer sheathed aluminum conductor, armoured cables rated for 1100 V grade. The power cables shall be of 2 core for single phase, 4 core for sizes higher than 25 sq.mm for 3 phase 20KW AC load. Where high voltage equipments are to be fed, the cables shall be rated for continuous operation at the voltages to suit the same.
- b) Power cables shall be of sizes as per calculations or indicated in the tender specifications. In all other cases, the sizes shall be as approved by the Principal Investigator or nominee, after taking into consideration the load, the length of cabling and the type of load.

MAINTENANCE DURING DEFECT LIABILITY PERIOD

- a) The system will be comprehensively maintained by the contractor with no extra cost for Five (5) years from the date of taking over by the department i.e. during warranty / guaranty period.
- b) The contractor has to depute experienced service engineer for checking the complete installations on regular basis or as and when required for period of Five (5) years from date of taking over of the installations by the department i.e during warranty / guarantee period, for which nothing extra shall be paid.
- c) Immediate fault rectification on lodging of complaint. The fault rectification shall be carried out by skilled staff. All fault rectification shall be done within reasonable time preferably within 36 hrs and all faulty equipment shall be collected from site and repaired equipment delivered at site.
- d) Maintenance will also include :-
 - a. Providing on call services for any breakdown and rectification of fault within 24 hours of the reporting of the problem.
 - b. Any delay in attending the complaints beyond 36 hours of lodging complaint will attract a penalty of Rs. **1000/-** per day, this charges will be deducted/managed from security money.
 - c. The maintenance service provided shall ensure proper functioning of the SPV system as a whole to the extent covered in the contract. All preventive /routine maintenance and breakdown/corrective maintenance required for ensuring maximum uptime shall have to be provided.
 - d. The bidder shall submit the preventive/Routine/breakdown maintenance schedule as per their standard practice along with the bid. During warranty period of *10 years for PV modules*, contractor shall check / inspect the complete system once every year in the month of March and submit the detail report of working of the system.

Note- Equivalent standards may be used for different system components of the plants. In case of clarification following person/agencies may be contacted.

- Ministry of New and Renewable Energy (Govt. of India)
- National Institute of Solar Energy
- The Energy & Resources Institute
- TUV Rheinland
- UL

(TECHNICAL SPECIFICATIONS OF MAJOR EQUIPMENT)		
1.1	<i>SPECIFICATION FOR SOLAR PV PANEL</i>	
SL No.	Description	As Per NIT
1	Minimum. Output (Pmax) as per STC	500Wp-550Wp mono-PERC / TopCon or equivalent, PID Free (PID certified)
2	Voc/Isc	45V/13A or higher
3	MPP Voltage (Vmpp) V	40V (Min)
4	MPP current (Imp) A	12A
5	Open circuit voltage (Voc)V	45 V (min)
6	Normal operating cell temperature	45 ± 2 Degree C
7	Module dimensions (LxWxH)	As per rating of the panel
8	PV Module type	Mono Crystalline (High eff.)
9	No. of PV cells per Module	144/As per Manufacturer Standard
10	Min. efficiency of solar cell	> 20.5 %
11	Solar module frame material	Aluminium
12	Weather resistant junction	IP65 and above
13	Glass	Toughened / Tempered
14	Glass iron content	Low Iron
15	glass transmissivity	High transmissivity
16	Frame	Anodized aluminium
17	Encapsulation	Ethyl Vinyl Acetate (EVA)
18	Trilaminate back surface	Tedlar / Polyester
19	By-pass diode	To be provided 2 in each module
20	Standard	IEC 61215 / IS 14286 & IEC 61730 Part 1 & Part 2
21	Performance guarantee	10 years of 90% power output 27 years of 80% power output
22	Product Warranty	10 years against manufacturing defects.
23	PV Panel certification &	TUV/NISE
24	Made	Solar PV modules/Panels are to be of Indian origin (Cells of the panel may be overseas made).
Testing of 10% Samples will be witness by IIT Kanpur		

1.2	SPECIFICATION OF SOLAR INVERTER (GRID connected)	
SL No.	Description	As Per NIT

1	Type	Grid connected, PID Enabled
2	Max. DC Array Input Voltage	1000 V (Preferable)
3	DC voltage tolerance	20% to +15% of the DC array input voltage
4	Type of inverter	Dual MPPT (with Multiple string inputs)
5	Switching Device	MOSFET / IGBT BASED
6	Continuous inverter output rating	20 to 50 kWp (as per requirement of location) (higher power and design ratings are preferable)
7	Output wave form	Pure Sine wave output
8	Total harmonic distortion	< 5% with rectifier load
9	Nominal AC output voltage and frequency	415V 3 phase 50Hz, 50 Hz +0.5 Hz
10	Output frequency	50Hz
11	Grid frequency tolerance	+5%
12	Grid frequency synchronization range	3Hz
13	THD	<3% with resistive
13	No-Load losses	<1%
14	Power factor	> 0.9 Lagging
15	Inverter efficiency	>98 % at nominal voltage & power
16	Noise level	< 57 db
17	Certifications	IEC 61727, CE, IEC 62109-1, IEC 62109-2, IEC 61683/IS 61683, IEC 60068-2(1,2,14,30)
18	Idle current	< 4 % of rated capacity
19	Regulation Line regulation and load regulation	-2%
20	Over load features	150% for 1 minute , 110-120% for longer time
21	Cooling	Forced air cooling with temperature controlled cooling/Regulated air cooling
22	Operating Temperature	(-)10°C to 55°C
23	Relative Humidity	0.95
24	LED/LCD display	Indications display shall indicate system functional parameters and protection functional indicators
25	Data Monitor and display controls	RS 485, Ethernet connectivity/Wi-Fi
26	Protections	1) Input over Voltage
		2) Low/High frequency
		3) Short Circuit
		4) Under/over output voltage
		5) Over Temperature
		6) Grid input under voltage/over voltage with auto recovery
		7) DC disconnect device
		8) DC reverse polarity
		9) Anti Islanding protection as per the standard
		10) Fault ride through feature
27	Enclosure Protection Safety	IP65 and above
28	Warranty	5 years or more.

1.3	SPECIFICATIONS FOR ARRAY JUNCTION BOX (DCDB)
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Sl. No	Description	As per NIT
1	No. of module in series	As per NIT
2	No. of module in parallel	As per manufacturer standard as per manufacturer standard 500Wp -550Wp
3	Minimum Capacity of each SPV panel	MCB / MCCB
4	Switch gears	1.1 KV grade 100 Amps capacity
5	Connectors	FRLS copper conductor single core cable
6	Wiring	1.1 KV grade of required size.
7	Enclosure Protection	IP 65/66/67 (outdoor) dust & vermin proof weather resistance
8	Enclosure	Thermoplastic / Polycarbonate material
9	Size	As per manufacturer standard/ Site requirement.

1.4 SPECIFICATIONS FOR PV PANEL SUPPORT STRUCTURE

Sl.No.	Description	As per NIT
1	Material	Hot dip galvanized steel (85 Microns) with corrosion less paint.
2	Thickness of member	2 mm
3	Over all dimensions	As per manufacturer standard
4	Wind rating	180Km/H
5	Tilt angle and adjustment	Adjustable as per site requirement (around 25 Degree)
6	Peach of structure	
7	Hard wears & fastener	SS 304. (1 bolt+2 plain washer+ 1 spring washer+ 1 nut all hot dipped galvanized.
8	Foundation	To be approved by the Principal Investigator or Nominee

1.5 SPECIFICATIONS FOR ACDB (AC PANEL)

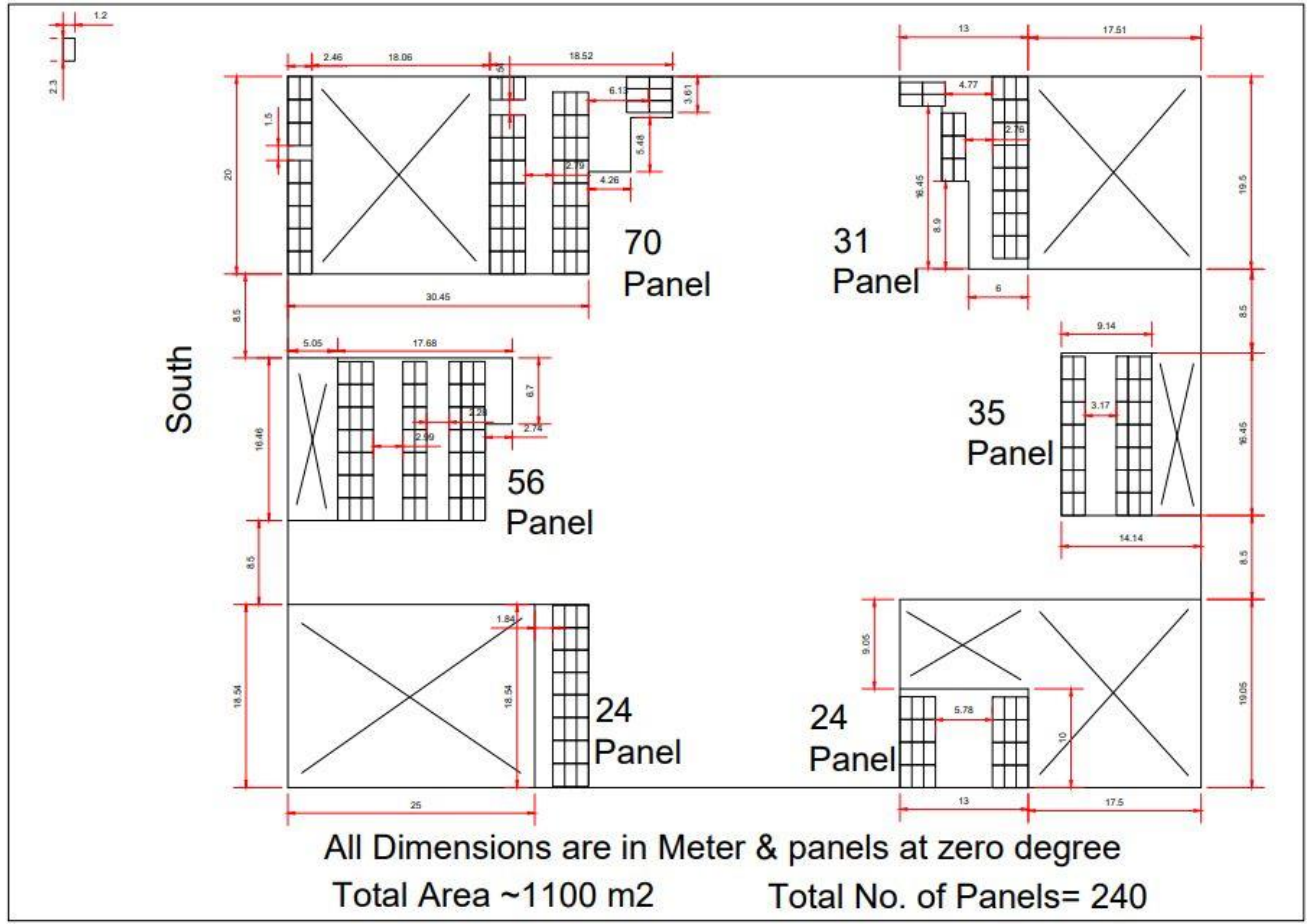
SL.No	Description	As per NIT
1	Make	As per approved make list
2	Thickness of sheet metal	2 mm
3	Size of bus bar	25mmX5mm copper
4	Material of bus bar	Copper
5	Bus bar Insulation	PVC Sleeve
6	Over all dimension	As per design
7	Degree of protection	IP 65/66/67 as per IS 13947

Tender drawings

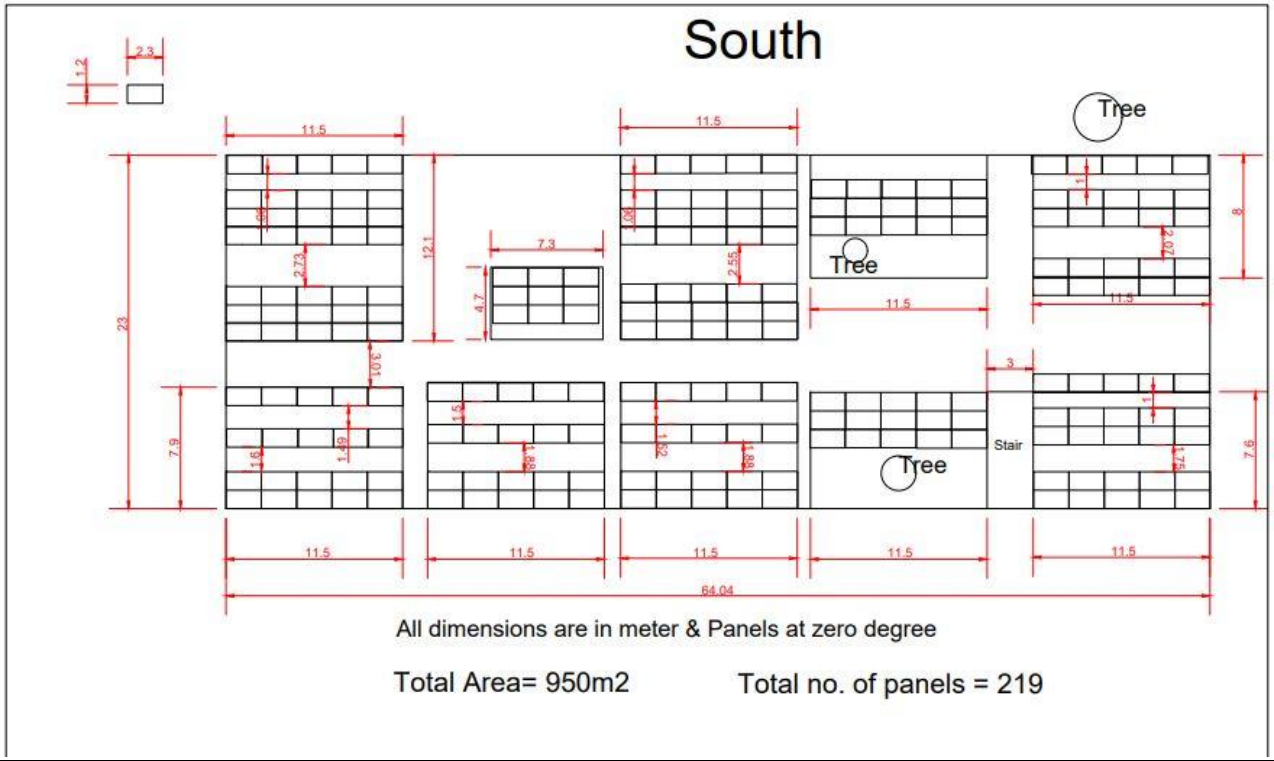
Drng. No.	Title

01	SOLAR ARRAY LAYOUT PLAN ON THE TERRACE: Location 1
02	SOLAR ARRAY LAYOUT PLAN ON THE TERRACE: Location 2
03	STANDARD SINGLE LINE DIAGRAM (SLD)
04	SHADING REPORT

01) Location 1:

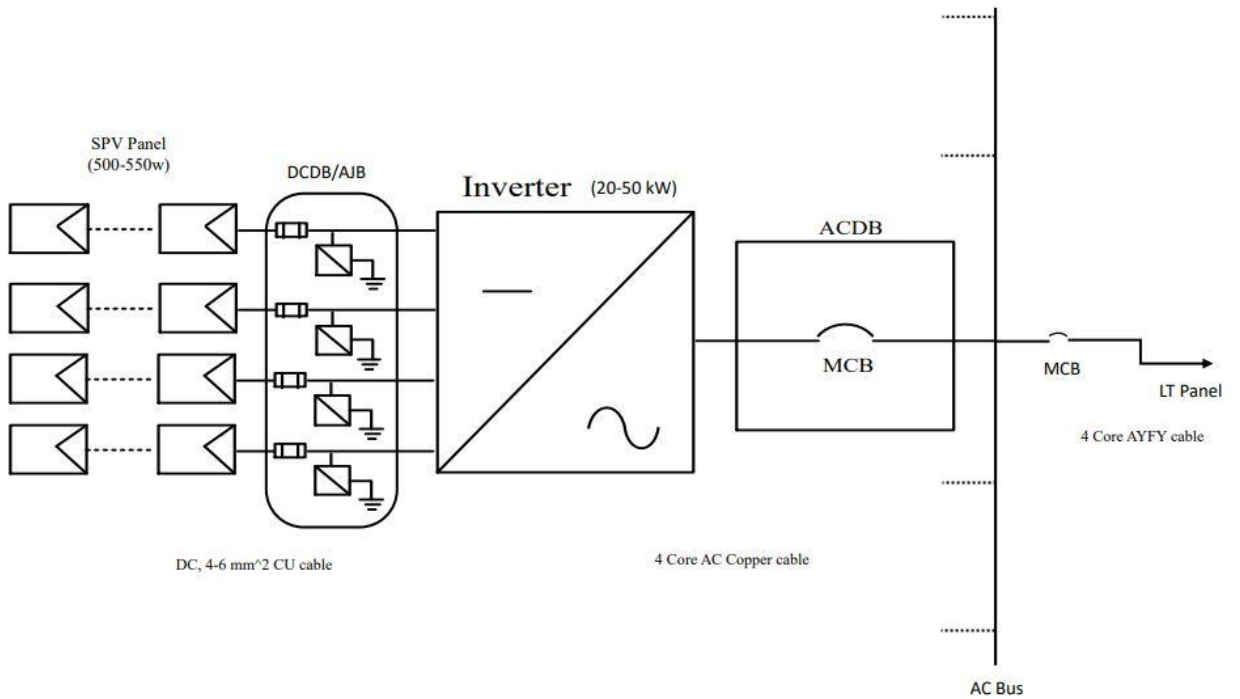


02) Location 2:



03) Standard SLD:

Standard SLD of Solar plant setup



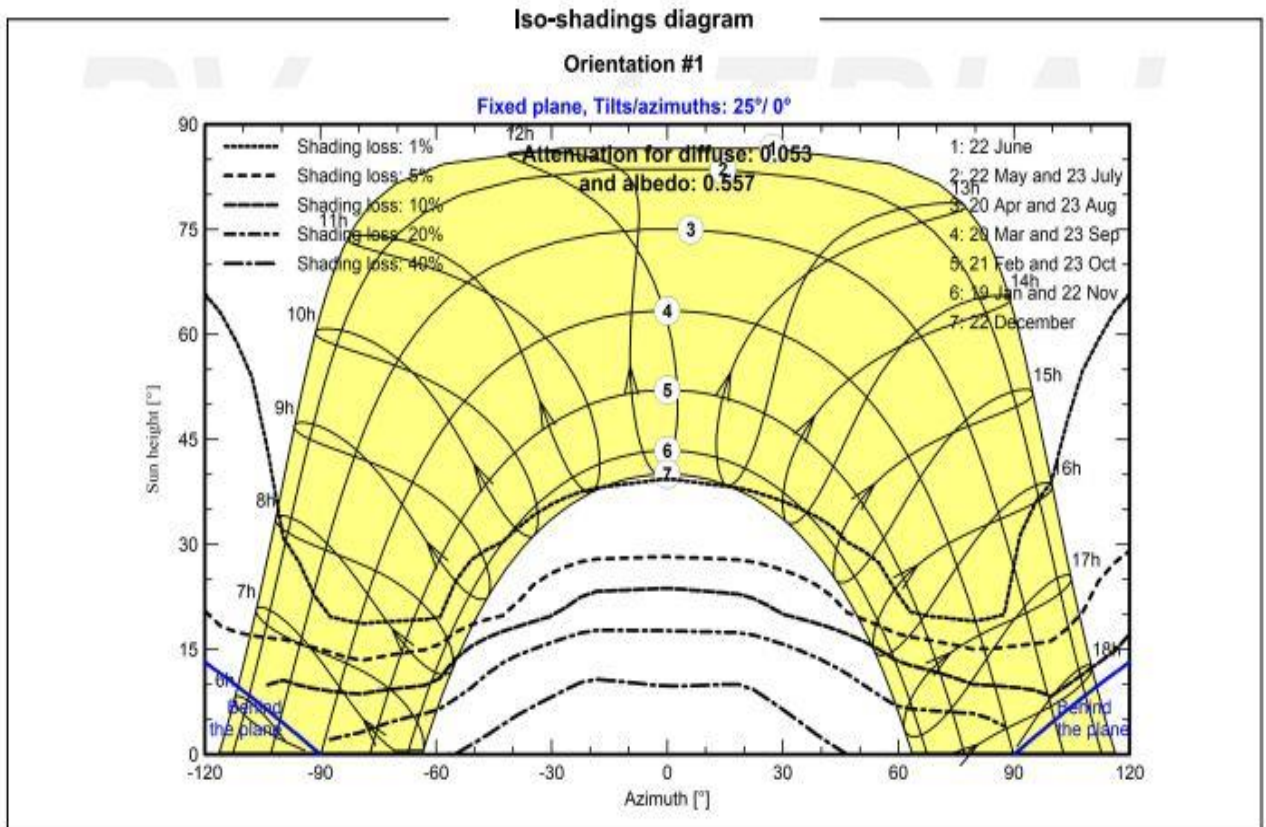
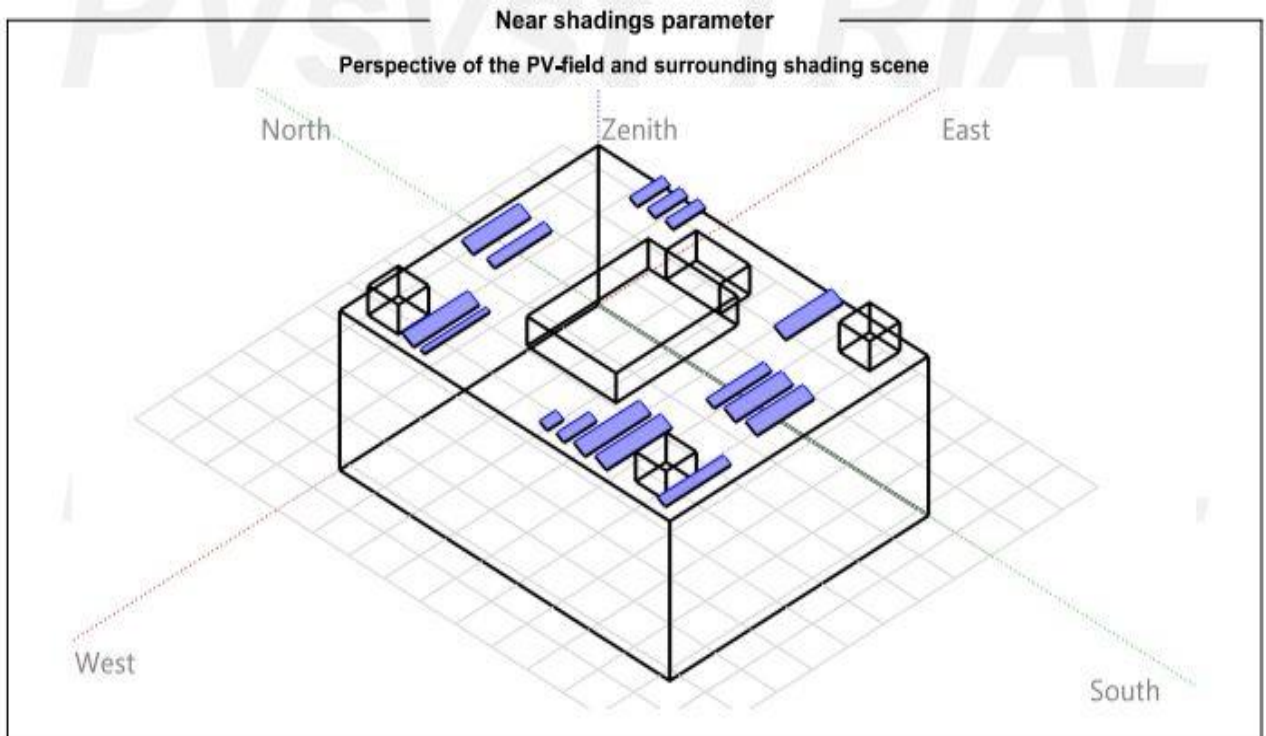
Note:

1. This SLD is standard for all and may be subjected to any changes as per site requirement.
2. All the DC Connections shall be done by Standard DC cables (+ve, -ve, and E) with a suitable thickness mentioned in the SLD.
3. All the AC Connections shall be done by Standard AC cables (3 phase R, Y, B, N, E) with a suitable thickness mentioned in the SLD.
4. Connection to the LT panel will be done by the Standard AC cables (3 phase R, Y, B, N, E) with a suitable thickness mentioned in the SLD.
5. *At Location 1:* The LT panel is at the basement of the building (Length of the cable should be from the 6th floor to the basement with suitable wiring procedure as per the institute (IWD) guideline.
6. *At Location 2:* The LT panel is at the ground floor of the building (Length of the cable should be from the 2nd floor to the ground floor with suitable wiring procedure as per the institute (IWD) guideline.
7. Reference to the Inverters are supplied through Standard AC cables as per their ratings.
8. No hanging wire is allowed, all the wire of the plant should be properly hinged/covered/tray.

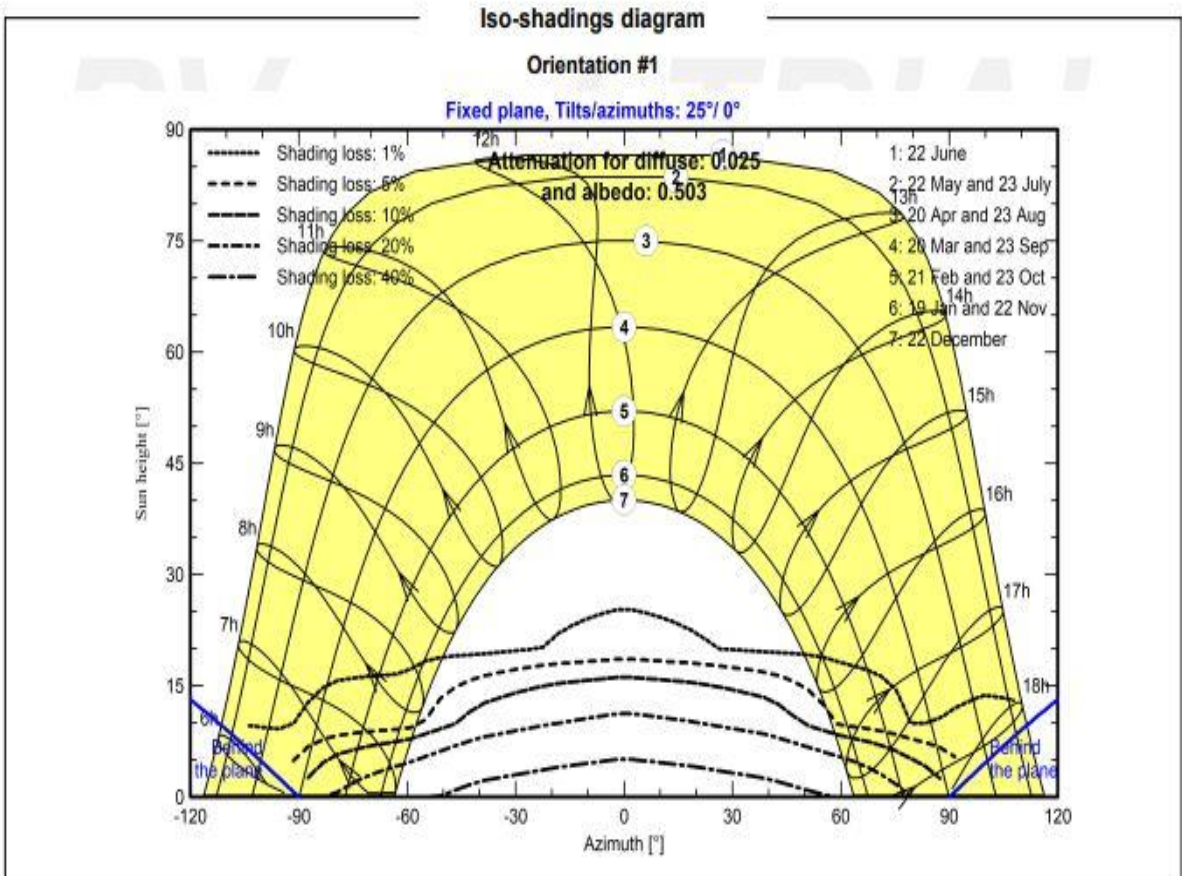
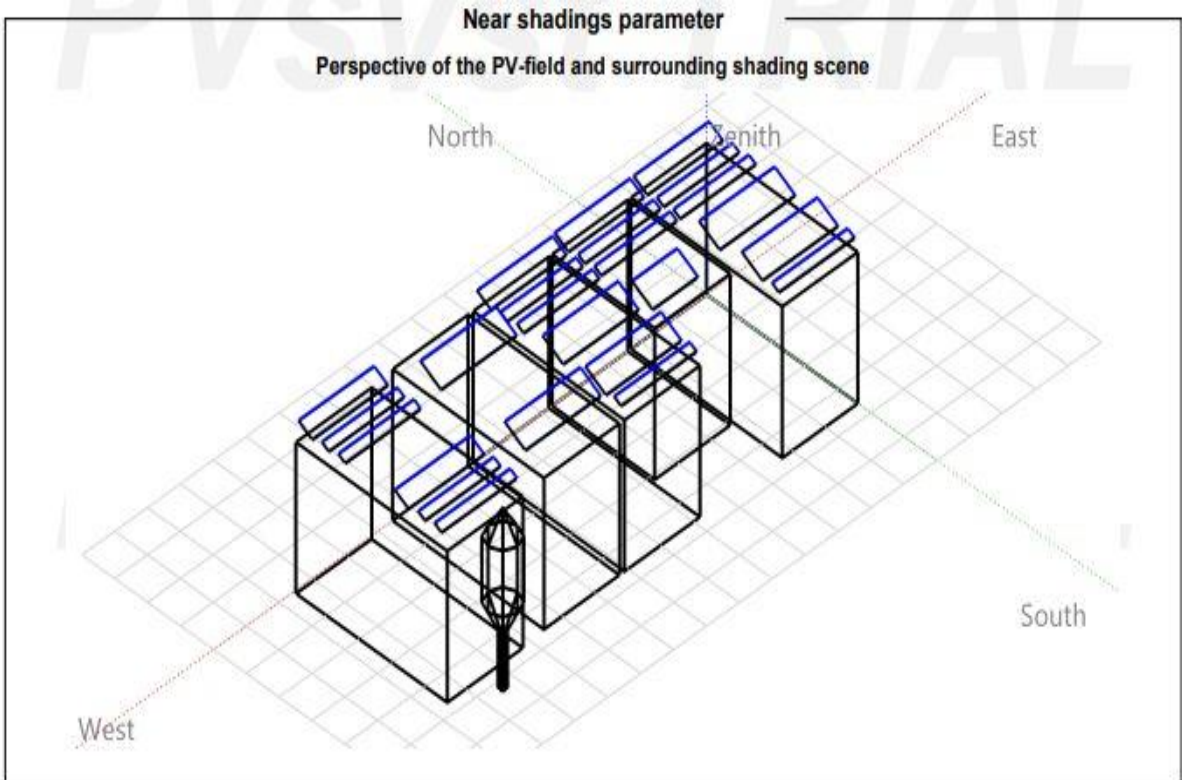
**** The drawings, SLD and reports are tentative in nature may subjected to slight changes, the final approval of the same may be given after the site visit. ****

04) Shading Report:

Location 1:



Location 2:



LIST OF APPROVED MAKES

1.	Solar PV Panel	Waaree, Vikram, Adani, Tata solar, Adani, Havelles Luminious or equivalent MNRE approved
2.	Grid Tie Inverter	Delta, SMA, Schneider, ccc, Kaco, ABB, Statcon,
3.	Conduit pipe painted inside & outside 16 SWG ISI marked.	BEC, M-Kay, AKG, S.K. (E.R.W.)
4.	Conduit Accessories & Junction boxes	<ul style="list-style-type: none"> • All made out of 16G MS sheet • All made out of 14G MS sheet
5.	Wires PVC insulated and PVC sheathed FR/ FRLS /control wires (IS marked)	Finolex , Havells , R.R. Kabel. KEI, Gloster, V-Guard
6.	PVC/XLPE insulated LT cables	Universal , Gloster , KEI, Havells
7.	XLPE insulated HT cables	Universal , Gloster , KEI, Havells
8.	Modular switches and sockets	<ul style="list-style-type: none"> • Legrand (ARTEOR) • ABB • L&T • MK Honeywell (wrap around plus)
9.	Flush type switch and sockets	<ul style="list-style-type: none"> • Anchor • Kinjal • SSK • Havells Reo
10.	Air circuit breaker	<ul style="list-style-type: none"> • L&T • ABB • Siemens • C & S
11.	Fuse switches Unit/Switch Fuse Unit & HRC fuses	<ul style="list-style-type: none"> • L&T • Siemens • Havells • C & S
12.	Distribution boards MCB	<ul style="list-style-type: none"> • Legrand • Siemens • ABB • C & S
13.	Loose wire box for distribution boards	<ul style="list-style-type: none"> • Legrand • Siemens • ABB • C & S
14.	MCB's	<ul style="list-style-type: none"> • Legrand • ABB • Siemens • C & S
15.	MCCB	<ul style="list-style-type: none"> • Legrand • Siemens • L&T • ABB • C & S
16.	Cable lug	<ul style="list-style-type: none"> • Ascon (Heavy gauge) • Jainson • Dowells
17.	Safe trip/RCCB/ELCB	<ul style="list-style-type: none"> • Legrand • ABB

		<ul style="list-style-type: none"> • Siemens • C & S
18.	GI pipe `B` class	<ul style="list-style-type: none"> • Prakash Surya • Jindal
19.	Electrical Switchboards / feeder pillar/LT panel/ACDB Panel	<ul style="list-style-type: none"> • Milestone Switchgear Pvt. Ltd • Neptune Systems Pvt. Ltd. • Tricolite Electrical Industries • Modern Switchgears/ ESSAAR/Adlec
20.	Telephone wires/Telephone Cable / jelly filled telephone cables	<ul style="list-style-type: none"> • Finolex • Delton • Havell's • R.R. Kabel
21.	Telephone tag blocks	<ul style="list-style-type: none"> • Krone • Pouyet
22.	Telephone outlet	<ul style="list-style-type: none"> • MK Electric • Legrand (Mosaic) • Crabtree (Piccadilly)
23.	GI raceways	<ul style="list-style-type: none"> • Milestone Engineering • Legrand • MDS • Neptune Systems Pvt. Ltd. • MK
24.	PVC raceways	<ul style="list-style-type: none"> • Legrand • MK
25.	Panel meters	<ul style="list-style-type: none"> • L&T Rishab • AE • Secure • Conzerv • C & S
26.	Current transformer	<ul style="list-style-type: none"> • Gilbert Maxwell • Kappa • AE
27.	Selector switch	<ul style="list-style-type: none"> • L&T • Kaycee • Siemens • C & S
28.	Protective relays	<ul style="list-style-type: none"> • ABB • C & S
29.	Smart Energy Meter	<ul style="list-style-type: none"> • Enercon • Anchor • L&T • HPL • Conzerv • Secure
30.	Changeover switch	<ul style="list-style-type: none"> • L&T • HPL • Havells • C & S
31.	Electronic ballast	<ul style="list-style-type: none"> • Philips • Wipro • Bajaj

		<ul style="list-style-type: none"> • Decon • Crompton • Havells
32.	DLP plastic trunking	<ul style="list-style-type: none"> • Legrand • MK
33.	Programmable Logic Controller(PLC)	<ul style="list-style-type: none"> • Siemens • Allen-Bradley • Schneider
34.	Earthing (Chemical Earthing) Plate Earthing	<ul style="list-style-type: none"> • JMV • As per CPWD Norms
35.	Control Relay Panel	<ul style="list-style-type: none"> • CGL • Schneider • ABB
36.	Lightning Arrestor	<ul style="list-style-type: none"> • ABB • Alltec • JMV
37.	HT/LT cable joints (Straight through/outdoor/indoor)	<ul style="list-style-type: none"> • 3M • Denson • GSeal

Note: Any other material not listed shall be approved by Principal Investigator or Nominee.

Requirement of Technical Representative (S) and recovery Rate-

Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical / Technical representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling this criteria.	
						Figures	Words
1.	B.E./B.Tech	Electrical / mechanical	Project Manager/Site Engineer	5	1	Rs.25,000/- p.m	Twenty Five Thousand per month

*For supervision of solar pv installation as well as electrical items of work, technical representatives of the respective disciplines will be required to be deployed.

QUALITY ASSURANCE OF THE WORK

Sampling of Materials:

1. The contractor shall procure all the materials at least in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.
2. All materials brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.
3. The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.
4. There shall be pre dispatch factory inspection for all major equipment's like Solar PV Panels and Grid tied inverters. The solar PV Panels shall be TUV/NISE Certified. The sample of Solar PV panel shall be tested at TUV/NISE labs.
5. The testing charges shall be borne by the bidder.
6. The work shall be treated as on works contract basis and the rates tendered shall be for complete item of work and all charges for items contingent to the work, such as packing, forwarding, insurance, freight, testing charges of sample solar PV panel at TUV/NISE lab and delivery at site for the materials to be supplied by the contractor, watch and ward of all materials at the site, labour related expenses as per relevant labour laws, testing of materials/ samples etc.
7. The Panel mounting structure design report shall have to be done by the executing agency as per the indicated layout in the attached drawing. The overall load on the terrace shall not be exceeded by 180 kg/m². The proposed design shall be got approved by the IIT Kanpur before execution by the agency.
8. ***The Solar PV modules shall be handled with care during the course of installation work, any damage caused to the modules shall be made good by the contractor at his own cost.***
9. Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.
10. It should be noted that license/competent welder, fitter, mason and Electrician shall only be allowed for the piping, civil and electrical works. (as per govt. norms)
11. The contractor shall fully comply with all legal orders and directions of the Public or local authorities or municipality and abide by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.
12. The structural and architectural drawings shall at all times be properly co-related before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and Architectural drawings relating to the relevant item, the former shall prevail unless otherwise given in writing by the Principal Investigator.
13. Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time. All the excavation and digging of the trenches shall be done manually as numbers of

service line are passing inside the campus except in certain cases as approved by IITK. **No Hydraulic Excavator shall be allowed** for earth digging work except in certain cases as approved by IITK.

14. It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
15. The entire royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle sand etc. collected by him for execution of the work, directly to the Revenue authority or authorized agents of the State Government concerned or the Central Government, as the case may be.
16. The contractor shall bear all incidental charges for cartage, storage and safe custody of materials issued by the departments and shall construct suitable go downs, yards at the site of work for storing all materials as to be safe against damage by sun, rain, dampness, fire, theft etc. at his own cost and also employ necessary watch and ward establishment for the purpose, at his own cost. Materials to be charged directly to work and stipulated for issue free of cost shall also be issued to the contractor as soon as those are received at site or at the stipulated place of issue.
17. The scope of contract comprises the supply, installation, testing & commissioning of 200 kW capacity rooftop on grid type solar PV plant on the GI mounted structure on the terrace of Diamond Jubilee Academic Complex (DJ Building) and Centre for Environmental Science & Engineering Building with **5 years** of defect liability. The provision of all labour, materials, construction of plant equipment and transpiration, temporary works and everything, whether of temporary or permanent nature required in and for such construction, completion and maintenance so far as the necessity for providing the same is specified in or reasonably be inferred from the contract. The contractors shall make his own arrangements for the store/ storage of materials, accommodation for his staff etc. and no claim for the temporary accommodation from the contractor shall be entertained.
18. The contractor shall carry out and complete the said work in every respect in accordance with this contract and as per the directions and to the satisfaction of the PI. Issue of further drawings and /or written instructions, detailed directions and explanations which are hereinafter collectively referred to as instructions of the PI in regards to:-
 - a. The variation or modification of the design, quality, or quantity of works or the addition or omission or substitution of any work.
 - b. Any discrepancy in the drawings or between the schedule of quantities and /or drawings and/or specifications.
 - c. The removal from the site of any materials brought thereon by the contractor and the substitution of any other material thereof.
 - d. The dismissal from the works of any persons employed thereupon.
 - e. The opening up for inspection of any work covered up.
 - f. The amending /making good of any defects.
19. Water and electricity required for the works shall be supplied free of charge.
20. **Conditions for Electrical Works:-**
 - a. All chase cuttings in the wall, for recessed conduits & boxes and drilling the holes shall be done with power operated machines only. No chase shall be allowed to be cut manually with the use of hammer & chisel.

- b. All cuttings in cement plaster and brick shall be made good by using cement mortar 1:3 (1 part cement, 3 part coarse sand).
- c. The cut surfaces shall be repaired by an experienced mason only so as to match the repaired plaster with the original.
- d. All such repaired surfaces shall be cured for 3 to 4 days to keep the surfaces wet, using water spray machine (hand/motor operated) and avoid unnecessary flooding of the area.

21. Payment shall be regulated as under-

<i>Estimated cost of the work: 85,00,000/</i> (Incl. of all Taxes)	<i>Earnest Money: 2,00,000/</i>
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- a. 75% of the tendered rate on receipt of materials at site.
 - b. 12.5% of the tendered rate on successful installation and Connection.
 - c. 10% of the tendered rate on Testing, Commissioning and performance report of at least 1 month.
 - d. The corresponding deducted security (2.5%) from the total completed cost item wise, shall be retained by IIT Kanpur till the completion of the comprehensive warranty of the major equipment's/completion of the defect liability period of 5 years or it may be released against the Bank Guarantee of same amount for the above said period.
22. The earnest money of the unsuccessful tenderers shall be refunded on written request, within 1(one) month of the award of work. The earnest money of the successful tenderer shall however be adjusted towards the security deposit.
23. Following drawings shall be provided by the contractor **before execution** of the above work-
- a) Solar PV plant detailed equipment layout, Solar PV array layout with mounting structure on the terrace, STAAD analysis of the mounting structure to withstand wind speed of 180kmph or higher , single line diagram, Communication architecture, cable schedule, earthing detailed drawing, lightning arrestor calculation and drawing & electrical connection drawings showing details of size, type, and mode of installation.
 - b) GFC for 200 kW solar PV plant showing inverter detail, ACDB panel connection, Earthing and LA connection.

Completion drawings:-

- a. On completion of works and before issuance of completion certificate, the contractor submit completion drawings in the form of four complete set of originals (reproducible) in hardcopy and softcopy.
- b. As built GA and schematic layout drawings of solar PV plant detailed equipment layout, Solar PV array mounting structure on the terrace, STAAD analysis of the mounting structure to withstand wind speed of 180kmph or higher, single line diagram, Communication architecture, cable schedule,

Earthing detailed drawing, lightning arrestor calculation and drawing & electrical connection drawings showing details of size, type, and mode of installation.

- c. Technical literature, TUV/NISE solar PV panel, inverter test certificates, and operation and maintenance manuals for inverters.

24. Scope of Works and Special Conditions

Scope of work includes supply, installation, testing & commissioning of Solar PV panels, grid tied inverters, equipment and materials, testing at manufacturers works, inspection, packing and forwarding, unloading at site, associated civil works, services, permit and incidentals, defect liability period of 5 years at all stages of 200 kWp Grid connected Solar PV plant at ¹Diamond Jubilee Academic Complex (DJ Building) and ²Centre for Environmental Science & Engineering Building of IIT Kanpur.

- a) Solar PV modules in array including mounting frames, structures, foundation for holding structures and module, inter connection etc.
- b) Array junction boxes, distribution boxes / boards and fuse boxes, MCBs, Surge Arrestors, isolation system etc.
- c) Solar Inverters, / Data logger inbuilt with inverter to check the generated data.
- d) Digital Voltage meter and ammeter, smart Kwh Meters. Metering instrument and protection relays.
- e) LT Power and control cables including end terminations and other required accessories for both AC & DC power.
- f) Lightening arrestors for lightening protection.
- g) Tool kit and Earthing kit.
- h) Suitable Earthing system with necessary earthing strips as per industry standards specification, for PV Array, DC power system, lightening protection system and for AC Panel.
- i) Covered enclosure made of suitable material for protection of wiring from PV Module to AIB and AIB to inverter.
- j) In addition to above, the bidder is required to measure the Solar Radiation and other climatic conditions. The major categories of site-specific assessment required are:-
 - Global Solar Radiation (GSR).
 - Diffuse Solar Radiation (DSR).
 - Sunshine Duration.
 - Atmospheric Turbidity.
 - Temperature & Humidity.
 - Wind Speed.
- k) Galvanized steel rigid / flexible conduits and accessories, Hume pipes, ferrules, lugs, glands, terminal blocks, galvanized sheet steel junction boxes, cable fixing clamps, nuts and bolts etc. as required.
- l) Civil works shall be performed with respect to the Design and construction of self-supported module mounting structures having modules and for Inverters, panels etc.
- m) Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the solar power plant are

deemed to be included in the scope of the specification unless specifically excluded on Trunkey basis.

- n) Various supplies to meet out load: grid supply: 3 phase, 415 volts ac, Priority of utilization of solar plant generation for load.

Note: Solar plant shall be connected & synchronized to existing grid directly and generated load shall be supplied to local distribution system.

25. The tender document contains 54 pages. No page of the tender document shall be removed, mutilated, detached, or cancelled.

SPECIAL CONDITION FOR SAFETY AT THE WORK SITE

The contractor will identify one of the supervisors for taking care of implementation of Safety systems. The Contractor should follow the following General Guidelines governing the safety rules as laid down under:

1. Smoking is strictly prohibited at workplace.
2. Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on. Drivers, helpers and operators are no exception.
3. No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level.
4. No one is allowed to work without adequate foot protection.
5. Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, chipping, welding and gas-cutting. For other jobs as and when site safety co-ordinator insists eye protection has to be provided.
6. All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job.
7. All excavated pits shall be barricaded & barricading to be maintained till the backfilling is done. Safe approach to be ensured into every excavation.
8. Adequate illumination at workplace shall be ensured before starting the job at night.
9. All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.
10. Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.

11. Material shall not be thrown from the height. If required, the area shall be barricaded and one person shall be posted outside the barricading for preventing the tre-passers from entering the area.
12. Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.
13. All electrical connections shall be made using 3 or 5 core cables, having a earth wire.
14. Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.
15. A tools and tackles inspection register must be maintained and updated regularly.
16. Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work every day.
17. All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.
18. No children shall be allowed to enter the workplace.
19. All the lifting tools and tackles shall be stored properly when not in use.
20. Clamps shall be used on Return cables to ensure proper earthing for welding works.
21. Return cables shall be used for earthing.
22. All the pressure gauges used in gas cutting apparatus shall be in good working condition.
23. Proper eye washing facilities shall be made in areas where chemicals are handled.
24. Connectors and hose clamps are used for making welding hose connections.
25. All underground cables for supplying construction power shall be routed using conduit pipes.
26. Spill trays shall be used to contain the oil spills while transferring / storing them.
27. Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

Principal Investigator

Appendix -1

TENDER ACCEPTANCE LETTER
(To be given on Company Letter Head)

Date: _____

To,

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: _____

Name of Tender / Work: _____

Dear Sir,

1. I / We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: _____ as per your advertisement, given in the above mentioned website(s).

2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc .), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

3. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.

4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.

5. I / We do hereby declare that our Firm has not been blacklisted/ debarred/ terminated/ banned by any Govt. Department/Public sector undertaking.

6. I / We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organisation shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,
(Signature of the Bidder, with Official Seal)

Appendix -2
Certificate for Tender
(To be given on Company Letter Head)

Date: _____

To,

Sub: Certificate of compliance as per Rule 144 (xi) GFR's 2017

Tender Reference No: _____

Name of Tender / Work: _____ -

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Yours Faithfully,
(Signature of the Bidder, with Official Seal)

Appendix -3

Certificate for Tender for Works involving possibility of sub-contracting
(To be given on Company Letter Head)

Date: _____

To,

Sub: Certificate of compliance as per Rule 144 (xi) GFR's 2017

Tender Reference No: _____

Name of Tender / Work: -

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Yours Faithfully,
(Signature of the Bidder, with Official Seal)

Appendix - 4

Declaration for Local Content

(To be given on Company Letter Head - For tender value below Rs.10 Crores)

(To be given by Statutory Auditor/Cost Auditor/Cost Accountant/CA for tender value above Rs.10 Crores)

Date:

To,
The Director,
Indian Institute of Technology Kanpur,
GT Road, Kalyanpur, Kanpur -208016

Sub: Declaration of Local content

Tender Reference No: _____

Name of Tender / Work: -

4. Country of Origin of Goods being offered: _____

5. We hereby declare that items offered has _____% local content.

“*Local Content*” means the amount of value added in India which shall, be the total value of the item being offered minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

“**False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.*”

**Yours Faithfully,
(Signature of the Bidder, with Official Seal)**