

**DADA LAKHMI CHAND STATE UNIVERSITY OF PERFORMING AND VISUAL
ARTS
SECTOR-6, ROHTAK (HARYANA)**

**TENDER
DOCUMENT FOR**

**Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted
Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State
University of Performing and Visual Arts, Rohtak (Haryana).**

Prepared and issued by

**University Engineer Wing
DLCSUPVA, Rohtak**

DADA LAKHMI CHAND STATE UNIVERSITY OF PERFORMING AND VISUAL ARTS
SECTOR-6, ROHTAK (HARYANA)

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SPECIAL INSTRUCTIONS TO BIDDERS

Attached, separately

Chapter-2

DETAILED NOTICE INVITING TENDER (DNIT)

DETAILED NOTICE INVITING TENDER

(E-tendering)

SUB: Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

1. Dada Lakhmi Chand State University of Performing & Visual Arts, Rohtak came into existence on August 5, 2014 through Haryana Act No. 24 of 2014 by integrating four Government Technical Institutions, namely State Institute of Fine Arts (SIFA), State Institute of Design (SID), State Institute of Film & Television (SIFT) and State Institute of Urban Planning & Architecture (SIUPA). This University has been conceived to facilitate and promote studies and research in emerging areas of higher education with focus on new frontiers of Design, Fine Arts, Film and Television and Urban Planning and Architecture to achieve excellence in these and connected fields.
2. The campus is spread over 36 acre of land, beautifully designed with a healthy, verdant campus. It is centrally located in the state of Haryana at a distance of about 70 Kms from the national capital, 90 Kms from IGI Airport and 220 Kms from Chandigarh, and is well-connected with the road and railway network. With magnificent buildings and state-of-art infrastructure, it has spacious seminar halls, laboratories, workshops and studios, well-equipped with latest machinery and equipments. Central facilities like Auditorium, Seminar Halls, Central Library, etc. are also available for academics and extra-curricular activities. A girls' hostel with a capacity to accommodate 170 students is available in the campus. Housing facility for both faculty and nonteaching staff are almost complete
3. Presently, there are four Faculties in which 14 Under Graduate Degree level programmes are being run; four in the Faculty of Fine Arts, four in the Faculty of Design, five in the Faculty of Film & Television and Bachelor of Architecture programme in Faculty of Urban Planning and Architecture. Besides, four Post-Graduate programmes have been started in each faculty from the session 2019-2020. These new course are: Master in Fashion Design, Master of Applied Arts, Master in Mass Communication (Media Production) and Master of Planning (Urban & Regional).

4. Brief Scope of work

Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

The detailed scope of work to be carried out under this contract is defined in Chapter-5 (Job specifications).

5. DLCSUPVA has initiated e-tendering for execution of works through website <https://etenders.hry.nic.in>. Bidder is requested to obtain Class-3 Digital Signature Certificate (DSC) from any authorized certifying agency and register itself with E-tender website using the DSC. Detailed instructions are available on the website.
6. BRIEF DETAILS OF THE TENDER:

6.1.	NAME OF WORK	Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).
6.3.	TIME OF COMPLETION	04 months from the date of LOA.
6.4.	DOWNLOAD OF TENDER DOCUMENT	As per DNIT
6.5.	CONTACT PERSON	<p>1. Sh. Balbir Singh Sheokand Consultant University Engineering Wing Contact: 9416238633 Email:- uew@plcsupva.ac.in</p> <p>2. Sh. Sanjay Kumar SDE (Electrical) Contact: 9306363112 Email: sde.electrical@plcsupva.ac.in</p>
6.6.	PRE BID MEETING	UEW during office hours in any working day
6.7.	OPENING DATE AND TIME OF E-BID SUBMISSION	07.03.2024 @ 09.00 hours
6.8.	CLOSING DATE AND TIME OF E-BID SUBMISSION	28.03.2024 @ 17.00 hours
6.9.	DATE AND TIME OF TECHNO COMMERCIAL BID OPENING	29.03.2024 @ 10.00 hours
6.10.	EARNEST MONEY DEPOSIT	Rs. 3,84,510/- for Contractor Rs. 1,92,260/- for societies
6.11.	BID VALIDITY	04 (Four) months from last date of bid submission.

7.0 BRIEF TERMS AND CONDITIONS

- a) The subject tender is an e-tender & can be downloaded from DLCSUPVA website www.dlcsupva.ac.in and <https://etenders.hry.nic.in>. Tender Document will not be issued in person or sent by post. Bidder is mandated to get enrolled on e-Tendering portal (<https://etenders.hry.nic.in>). Bidders shall have to pay cost of bidding document online on e-tender website during submission of bid.
- b) Bidder is advised to read the instructions for e-tendering from the website <https://etenders.hry.nic.in>. The Help Documentation placed at Home Page provides necessary guidance to bidder for using the e-Tendering site. A user id will be issued to bidder by e-Procurement administrator for participation in e-tendering.
- c) The Tenderer shall furnish all necessary documents for the bidding entity along with their offer.
- d) Any bidder who has downloaded the tender document from DLCSUPVA website shall not construe the same as his qualification for the tendered work.
- e) Bidder shall download the Bidding Document in his own name and submit the bid directly. The Bidding Document is non-transferable.
- f) DLCSUPVA shall not be responsible for any expense incurred by bidders in connection with the preparation & delivery of their bids, site visit and other expenses incurred during bidding process
- g) DLCSUPVA reserves the right to assess bidder's capability and capacity to execute the work using in-house information and by taking into account other aspects such as concurrent commitments and past performance.
- h) Bidder submitting his bid should not be under liquidation, court receivership or similar proceedings.
- i) Fax/ E-mail / Hard Copy of bids shall not be accepted.
- j) DLCSUPVA reserves the right to reject any or all bids or cancel/withdraw the Invitation for Bids without assigning any reason whatsoever and in such case no bidder / intending bidder shall have any claim arising out of such action.
- k) At any time prior to the deadline for submission of bids, DLCSUPVA may for any reason, whether at its own DNIT or in response to a clarification requested by a bidder, modify the DNIT by amendment.
- l) The amendment will be notified through e-Tender portal/university website to all bidders who have downloaded the Tender Document and will be binding on them.
- m) In order to extend reasonable time to bidders for considering amendments while preparing their bids, DLCSUPVA may, at its discretion, extend the deadline for the submission of bids.
- n) In exceptional circumstances, DLCSUPVA may solicit the bidder's consent to an extension of the period of validity of bid. The request and the response there to shall be made by Fax/ e-mail/ e-Tender portal. The bidder, extending the validity of the bid, will not be permitted to modify the bid.
- o) After opening of bids, to assist in the examination, evaluation and comparison of bids, DLCSUPVA may, at its discretion, ask the bidder for a clarification on its bid. The request for such clarification and the response shall be in writing through e-Tender portal only.

- p) DLCSUPVA reserves the right of annulment of tender without assigning any reasons whatsoever.
- q) Consultants or their subsidiary company or companies under the management of consultant, are not eligible to quote for the execution of the same job for which they are working as consultant.
- r) Contractor shall raise all the bills in the name of Registrar, DLCSUPVA, Sector-6, Rohtak as mentioned in the Letter of Award (LoA) or Contract Agreement.
- s) Any legal dispute shall be within the jurisdiction of court at Rohtak.

Registrar

DLCSUPVA Rohtak

Chapter-3
PRE-QUALIFICATION CRITERIA (PQC)

PRE-QUALIFICATION CRITERIA (PQC):

Bidders must submit following documents as minimum pre-qualifying criteria for this tender. All such documents must be valid on the closing date of tender.

- 1.1 The minimum annual turnover during the preceding three financial years (i.e. for F.Y 2020-21, 2021-22 and 2022-23) should be at least Rs. 02.00 crores.

Total Revenue as per Schedule III of Companies act, 2013 (Earlier revised Schedule VI of Companies Act, 1956) shall be considered as Turnover. Audited Balance Sheet / Published accounts on a calendar year basis shall also be acceptable. (The balance sheet copy MUST bear the Registration Number of the authorized Chartered Accountant and its SEAL. This is not applicable for published annual reports)

Turnover for this purpose should be as per audited Balance Sheet including P&L Statement/ Published Account / Profit & Loss Account Statement of the tenderer. However, if the tenderer is not required to get its accounts audited under Section 44AB of The Income Tax Act, 1961, certificate from a Practicing Chartered Accountant towards the turnover of the tenderer along with copies of its Income Tax Return should be obtained. Audited Balance Sheet (P&L Statement) / Published accounts on a calendar year basis shall also be acceptable.

Definition of Turnover: Total Revenue as per Schedule III of Companies act, 2013 (Earlier revised Schedule VI of Companies Act, 1956) shall be considered as Turnover.

- 1.2 The bidder must have executed work order/s of similar nature of works (as explained under) of the following value in last five years till last date of tender.

Definition of similar works:

“Engineering, Procurement & Construction (EPC) or supply, erection, testing and commissioning of On-Grid Solar Power Project with Net-Metering Facility in any Central/State Govt./PSU or industry”.

A)	One Work Order of executed work (80% of estimated value of work).
B)	Two Work Orders of executed work (each work order of 50% of estimated value of work).
C)	Three Work Orders of executed work (each work order of 40% of estimated value of work).

Documents required to be submitted against proof of completion of the above submitted work orders:

- i) In case of Work Order from Government Bodies/ PSUs – the copy of work order/allotment letter and completion certificates duly Certified by the officer not below the rank of executive engineer.
- ii) In case of Work Orders from Private Parties- Certificate from CA certifying value of work done with TDS certificates (where applicable)/ bank statement shall be required in addition to that specifically in (i). TDS certificates / Bank Statements shall be used as corroborative

evidence only.

The cost as indicated above shall be inclusive of Service Tax or GST. The completion certificate, submitted by the bidder shall indicate the total value of completed job, inclusive of Service Tax or GST as applicable.

In case GST/Service Tax amount / component is not included in the indicated total value of completed job as submitted completion certificate, a separate certificate from the respective client, mentioning the GST service tax amount if any, paid separately extra over and above the value of completed job under consideration, should be submitted by the bidder. This amount needs to be added to the value of completed job mentioned in the completion certificate to arrive at the value of the completed job inclusive of service tax/GST as applicable.

The Work Order should contain the above similar work items and for qualification purpose the entire executed value of WO (which may contain any other item) shall be considered.

Please note that submission of work order along with its completion certificate is mandatory for qualification in the tender.

1.3 Other Mandatory Documents are as under:

Sr no.	Description
1	Copy of PAN card
2	GST Registration Certificate (GSTIN no.) In case GSTIN no is not available, an undertaking (on letter head) must be uploaded along with the bid as per format given in the tender document. (Annexure 23)
3	Partnership deed or Certificate of Incorporation with Memorandum & Articles of Association (Annexure 24)
4	Power of Attorney (POA) (on non-judicial stamp paper of appropriate value duly notarized): Authority of the person uploading the bids with his DSC, shall be required to be submitted in the bids. Document required shall be as given below. In case of proprietary concern: If the bid is submitted by the proprietor, no POA is required. However, he will have to upload undertaking (on letter head) certifying that he is sole proprietor, as per format given in the tender. (Annexure 25) If the bid is submitted by person other than proprietor, POA authorising the person other than proprietor, POA authorising the person to submit bid on behalf of the concern is to be submitted.

	<p>In case of company: Certified copy of Board Resolution authorising the person submitting the bid on behalf of the company OR POA and the supporting Board Resolution authorising the person submitting the bid on behalf of the company.</p> <p>In case of Partnership Firm/LLP: POA along with Deed of Partnership/LLP Agreement.</p> <p>In case of Cooperative Society: Copy of resolution passed as per Society Rules authorising the person submitting the bid on behalf of the Society.</p>
5	Declarations for non-tampering of tender (on letter head) as per format given in the tender document. (Annexure 9)
6	Declarations for “Blacklisting/Debar” (on NJSP not older than 15 days) as per format given in the tender document. (Annexure 5)
7	Declarations “A, B, C & D” as per format given in the tender document. (Annexure 7)
8	<p>Undertaking (on letter head) for Acceptance of Tender Terms and Conditions as per format attached separately.</p> <p>Bidders shall upload this undertaking in lieu of submission of complete set of technical bid documents, as a token of their acceptance. (Annexure 26)</p>
9	Undertakings and Declarations “Country of Origin and Percentage of Local Content” (Annexure 27)
10	Declaration on NCLT/NCLAT/DRT/DRAT/COURT RECIEVESHIP/LIQUIDATION (Annexure 28)

Note for Annual turnover

1. While computing turnover requirement, estimated cost inclusive of GST value.
2. Turnover for this purpose should be as per audited balance sheet including profit & loss statement/published account/profit & loss account statement of the tenderer. However, if the tenderer is not required to get its account audited under section 44AB of the Income Tax Act, 1961, certificate from a practicing Chartered Accountant towards the turnover of the tenderer along with copies of its Income Tax Return should be obtained.
3. For tenders invited during April-September, in case of non-availability of audited balance sheets (profit & loss account statement)/published accounts of the immediate preceding year, the audited balance sheet (P&L statement)/published account of the fourth preceding financial year shall also be acceptable.
4. Audited balance sheet (P&L statement)/published accounts on a calendar year basis shall also be acceptable.
5. Definition of Turnover: Total revenue as per schedule III of Companies Act, 2013 (earlier revised schedule VI of companies Act, 1956) shall be considered as Turnover.
6. For detail about process of payment of online EMD, tender fee, bidders shall refer “Special Instructions to the Bidder (SITB)”.

Important Note:

- i. Notwithstanding any other condition/ provision in the tender documents, bidders are required to submit complete documents pertaining to PQC along with their offer. Failure to meet the PQC will render the bid to be summarily rejected. DLCSUPVA reserves the right to complete the evaluation based on the details furnished by the bidder, with or without seeking any additional supporting document/clarifications.
- ii. After scrutiny of the Technical Bids, the eligible Bidders who meet all Technical requirements shall be notified regarding the date and time for opening the price bid.
- iii. Authenticated means self-attested. In case at a later stage, during verification of Original of these self-attested documents, any discrepancy is observed, the tender will be rejected. The person uploading the bid using his digital signature should have a Power of Attorney (POA) authorizing him to upload the bid in case of Partnership and Public / Private Limited firms. Copy of POA must be uploaded along with the bid.
- iv. Tenderers shall indemnify the university from any fraudulent declaration and consequences of the same.

Chapter-4 INSTRUCTIONS TO BIDDERS (ITB)

1. GENERAL

- 1.1. DADA LAKHMI CHAND STATE UNIVEFRSITY OF PERFORMING AND VISUAL ARTS, ROHTAK hereinafter referred to as DLCSUPVA, is State Govt. University situated in Rohtak, Haryana. DLCSUPVA intends Engineering, Procurement, Construction (EPC) of 400 kWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).
- 1.2. DLCSUPVA intends to select and appoint one of the empaneled Vendors/Registered with SECI/MNRE Contractors through competitive bidding in two-bid system (i.e. PART-I: Techno- Commercial Bid and PART-II: Price Bid) for the brief Scope of Work mentioned hereinafter.
- 1.3. The subject tender is an e-tender and available on DLCSUPVA website <http://dlcsupva.ac.in> and <https://etenders.hry.nic.in>. The bidding documents are and shall remain the exclusive property of DLCSUPVA without any right of the Bidder to use them for any purpose except bidding and with reference to the work.
- 1.4. The bidder shall submit their offer through e-tendering site as mentioned above, following the steps in the e-tendering portal. Physical Bid sent through Fax / Email / Courier / Post will not be acceptable. Bidder is advised to quote strictly as per terms and conditions of the tender documents for e-bidding and not to stipulate any deviations / exceptions.
- 1.5. Bidder is required to obtain a legally valid Class-3 Digital Signature Certificate (DSC) for its user who is authorized to submit bid on-line from the licensed Certifying Authority (CA). In case bidder already possesses the digital signature issued from authorized CA, same can be used in this tender. Further, the bidder should ensure that the email address given in the Registration Form is valid & active as all the communications will be made through this e-mail.
- 1.6. On no account will any person to whom bidding documents are furnished, part with possession thereof or copy or disclose the provisions thereof or any of them or disclose or take copies of tracings or of any drawing, plan or route forming part thereof, it being understood that the information therein is confidential, and that the bidding documents are therefore being furnished to bidder in strictest confidence.

2. BRIEF SCOPE OF WORK

The scope of the contractor shall be, including but not limited to

- 2.1. Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

The detailed scope of work to be carried out under this contract is defined in Chapter-5 (Job specifications).

3. SITE VISIT

- 3.1. Bidder shall satisfy himself of the site conditions and shall apprise himself of the procedure for engagement of agencies / labor and shall collect other relevant information that may be required before submitting the bid. Claims and objections due to ignorance of site condition will not be considered after submission of the bid.
- 3.2. Bidder shall fully acquaint himself as to all conditions and matters, which may in any way affect the work or the cost of thereof. The bidder shall be deemed to have him independently obtained all necessary information for the purpose of preparing the bid and his bid as

accepted shall be deemed to have taken into account all contingencies as may arise due to such information or lack of the same.

- 3.3. Bidder shall be deemed to have visited and carefully examine the site and surroundings to have satisfied himself about the nature of all existing facilities, infrastructure available for transport and communications and the access to the site for developing Solar Power Project.
- 3.4. Bidder is deemed to have acquainted himself of government taxes, laws structure, regulations, levies and other charges relating to the tendered work at site.
- 3.5. Bidder shall obtain all necessary clearances/ permission/ NOCs etc. for development of Solar Power Project, if required.
- 3.6. Any neglect or omission or failure on the part of the bidder in obtaining necessary clearances and reliable information upon the forgoing or any other matter affecting the bid shall not relieve him from any risks or liabilities or the entire responsibility for completion of the work in accordance with the bid.
- 3.7. Contact person for site visit:

1. Sh. Balbir Singh Sheokand
Consultant University Engineering Wing
Contact: 9416238633
Email: - uew@plcsupva.ac.in

2. Sh. Sanjay Kumar
SDE (Electrical)
Contact: 9306363112
Email: sde.electrical@plcsupva.ac.in

4. TENDER DOCUMENT

- 4.1. The tender document includes the following: -

PART-I: TECHNO-COMMERCIAL PART

1. Special instructions to bidders for participation in E-Tendering
2. Notice inviting tender (DNIT)
3. Instructions to Bidders (ITB)
4. Special Conditions of Contract (SCC)
5. Job Specifications
6. General Conditions of Contract (GCC-LSTK)
7. Annexures
8. Unpriced Price Bid

PART-II: PRICE PART

1. Price bid

Bidder is advised to read carefully all instructions and conditions appearing in this document and understand them fully. Bidder is expected to examine the tender documents, including all instructions, and specifications in the tender document. Bidder shall satisfy himself when he submits his offer against this invitation to bid. All information required as per the tender document must be furnished. Failure to furnish all the information required by the tender documents or submission of tender not substantially responsive to the tender document in every respect may result in the rejection of the tender.

5. PRICE OF TENDER DOCUMENT

- 5.1. Tender fee is Rs. 15000/-, Processing Fee Rs. 1000/- will be paid online only.
- 5.2. Bid documents shall remain the exclusive property of the DLCSUPVA without any right with the Bidder to use them for any purpose except for the purpose of tendering and for use by the successful Bidder with reference to the work.
- 5.3. Bidder, to whom the tender has been issued, shall not part with possession thereof or copy or disclose the provision thereof or any of them or disclose or take copies or tracings of any drawings, plans or routes forming part thereof, it being understood that the information therein are confidential and that the tender documents have been issued to the bidder solely for the purpose of bidding.
- 5.4. The tender document is non-transferable.

6. BIDDING DOCUMENT

- 6.1. Bidder shall upload the tender document as a token of acceptance of tender conditions. The bidding documents shall not be transferred to any other agency.

7. SUBMISSION OF OFFER

- 7.1. Bids shall be based strictly on the terms, conditions and specifications contained in the Tender document.
- 7.2. The Tender shall be submitted in “two bid system” in two parts viz. PART-I and PART-II as detailed below in two separate parts. Full name, postal and telegraphic address, FAX number of the bidder shall be given as specified. Further, both parts shall be uploaded separately:

Part I (Techno-commercial Bid)

Technical and commercial aspects of the offer with the techno-commercial part of the tender documents with NO PRICE indicated therein and Annexures to be uploaded as mentioned.

Part II (Price Bid)

Price Bid part of the offer (not to be opened with PART-I) shall be uploaded separately. It shall be noted that this part shall contain only PRICE. Any condition mentioned in Part-II of the tender by the bidder shall not be considered.

- 7.3. All amendments to tender documents issued by DLCSUPVA subsequently, if any, must be uploaded along with the Bid. The Bid uploaded by the Bidder shall take into account all such amendments.

7.4. PART-I (Techno-Commercial Bid)

This shall contain Technical and Commercial (Un-priced) proposal required and all the submittals required to be submitted along with the tender clearly highlighting “TECHNO-COMMERCIAL BID”, along with Name of Work, Name and Address of the Bidder. The bid document should be serially numbered on each page. Bidder to upload following documents as part of Bid:

- 7.4.1. Checklist for Bid Submission in the format given in Annexure-14

- 7.4.2. Covering Letter in the format given in Annexure-1 digitally signed by the authorized signatory along with Power of Attorney or any other proof of authority, in favor of the person who has signed the tender (or a copy thereof duly attested by a Gazetted Officer)
 - 7.4.3. Bidders General Information in the format given in Annexure-2
 - 7.4.4. Form of tender in the format given in Annexure-3(A)
 - 7.4.5. Performa of declaration of black listing/debaring in the format given in **Annexure-4**
 - 7.4.6. Undertaking for non-engagement of child labour in the format given in Annexure-5
 - 7.4.7. Declaration about the relationship, if any, with DLCSUPVA's director in the format given in Annexure-6
 - 7.4.8. Performa of certificate for non-involvement of agent in the format given in Annexure- 7
 - 7.4.9. Undertaking by the bidder(s) to comply non-tampering of tender forms & electronic data in the format given in Annexure-8
 - 7.4.10. Letter of Waiver of Conditions / Deviations in the format given in Annexure-9
 - 7.4.11. Bank guarantee in the format given in Annexure-10, in case of EMD through BG
 - 7.4.12. Bank details in the format given in Annexure-13
 - 7.4.13. Tender document along with Addendum/Corrigendum/Amendment, if any, issued for the tender duly stamped and signed on each page
- The techno commercial part shall be un-priced and no price shall be mentioned here.**

7.5. **PART-II (Price Bid)**

- 7.5.1. Bidders should upload Form of tender in format given in Annexure-3(B).
- 7.5.2. Bidders should upload price part / BOQ duly filled in all respects.
- 7.5.3. BOQ/Price bid shall contain only price and no conditions whatsoever.
- 7.5.4. The lump sum and agreed price for supply, erection & commissioning of complete Solar Power Project shall be as per SCHEDULE OF RATES / BOQ and shall include all cost towards taxes, equipment, labour & laboratory back-up, logistics, transport, travel and stay arrangements and other incidentals as may be necessary for rendering the services in totality as per detailed Specifications.
- 7.5.5. The price shall be firm and no escalation shall be paid. Payment shall be made after all statutory deductions as applicable to such type of contracts. The rate quoted shall be deemed to be inclusive of all salaries and other cost, expenses of employees, cost of spares, tools and tackles, insurance, etc. and liabilities of every description and all risk of every kind.
- 7.5.6. The contract price shall be deemed to be firm and valid for the entire duration of the contract till the completion of work, and shall not be subject to any adjustment due to increase in price of materials, utilities, taxes, duties etc. or any other input for performance of work and the contract.
- 7.5.7. The bidder shall upload the bid on or before the due date and time set out for the same.
- 7.5.8. Tender documents as uploaded by bidder shall become the property of DLCSUPVA.
- 7.5.9. DLCSUPVA shall not be liable for any obligation until such time DLCSUPVA has communicated to the successful bidder its decision to entrust the work.
- 7.5.10. The techno commercial part shall be un-priced and no price shall be mentioned here.
- 7.6. Submission of information and details shall be done strictly in the manner described. In case the relevant data/details/information in respect of the above is not furnished in the technical

part, the tender shall be liable for rejection.

- 7.7. Offer not complying with above submission procedure will be rejected. The bid including all uploaded documents shall be digitally signed by duly authorized representative of the bidding company.
- 7.8. DLCSUPVA shall not be responsible for any delay in uploading of bids for any reasons whatsoever.
- 7.9. DLCSUPVA may at its sole discretion, extend the bid submission due date / time.
- 7.10. Bid document shall be checked before submission to ensure that all information / documents required for qualification are included.
- 7.11. Transfer of bid document issued to one prospective Bidder to any other party is not permissible.
- 7.12. The Bidder will be deemed to have independently obtained all the necessary information for the purpose of preparing his bid.
- 7.13. All costs towards site visit(s), conference(s), preparation and submission of bids shall be borne by the Bidders themselves.
- 7.14. After receiving of proposal and till final selection of successful Bidder(s), no correspondence of any type will be entertained, unless called for by DLCSUPVA. Any type of uncalled for clarifications on prices and or rebates shall not be accepted.
- 7.15. The Bidder must quote the prices in line with the formats provided in the document.
- 7.16. Successful Bidder will be required to execute a Contract Agreement in the prescribed format. In the event of failure of Bidder to execute the contract agreement within specified period from the date of receipt of acceptance of the bid, failing which the full earnest money deposited shall be forfeited.
- 7.17. Bid proposal preparation is the responsibility of the Bidder and no relief or consideration will be given for errors and omissions.
- 7.18. Bidders shall declare that they are not under liquidation, any court receivership or similar proceedings.
- 7.19. Bidder to note that appropriate Grievance Redressing Mechanism is available for all such bidders participating in the tender.
- 7.20. Bidders are advised to submit offers in accordance with the terms & conditions and specifications contained in the tender document.

8. CONSORTIUM

Bids submitted by a Consortium shall NOT be accepted. Experience of only bidding entity will be considered for qualification.

9. DEVIATIONS

Bidders are advised to submit offers strictly based on the terms and conditions and specifications contained in the bid documents. This is a “Zero Deviation” bidding process. Bids with any deviation to the bid conditions shall be liable for rejection. The bidder has to submit the undertaking as per Annexure-9.

10. EARNEST MONEY DEPOSIT (EMD)

- 10.1. Earnest Money will be deposited/accepted online only.

11. VALIDITY OF OFFER

- 11.1. Tender submitted by the bidder shall remain valid and open for acceptance for a period of not less than 4 (four) months from the last date of bid submission. However, DLCSUPVA

reserves the right to cancel such tender and refloat the same.

- 11.2. In exceptional circumstances, prior to expiry of the original bid, the DLCSUPVA may request the Bidder for a specified extension in the period of validity. The request and the responses thereto shall be made in writing or by fax/ e-mail. A Bidder may refuse the request without forfeiting his bid security. A Bidder agreeing to the request will not be permitted to modify his bid, but will be required to extend the validity of his bid security correspondingly. The provisions of discharge and forfeiture of bid security shall continue to apply during the extended period of the bid validity.

12. RIGHT OF DLCSUPVA TO ACCEPT OR REJECT TENDERS

- 12.1. The right to accept the tender in full or in part/parts will rest with DLCSUPVA. However, DLCSUPVA does not bind itself to accept the L-1 Bid and reserves the right to reject any or all the tenders received without assigning any reason whatsoever.
- 12.2. Tenders in which any of the particulars and prescribed information is missing or is incomplete in any respect and/or the prescribed conditions are not fulfilled shall be considered non-responsive and are liable to be rejected.
- 12.3. The Bidder should note that the tendering can be abandoned / cancelled, if the DLCSUPVA deems fit, without assigning any reason whatsoever. No compensation shall be paid for the efforts made by the Bidders.

13. PRE BID MEETING

The date of pre bid meeting is not specific and the authorized representatives of the parties shall only be allowed to meet in the office of UEW in any working day to clarify the techno-commercial issues related to the tender, if any.

14. BID EVALUATION METHODOLOGY

- 14.1. Evaluation of both un-priced bids and priced bids shall be done separately.
- 14.2. Techno-commercial evaluation of the un-priced bids shall be carried out first. This will be done on the basis of documents furnished by the bidder and completeness & conformity of the bids with respect to the Instruction of Bidder (ITB) requirements. Prior to evaluation of Bids, DLCSUPVA shall determine whether each Bid is responsive to the requirements of the tender. A Bid shall be considered responsive only if:
 - a) It is received as per the formats specified;
 - b) It is received by the Bid Due Date including any extension thereof;
 - c) It is accompanied by EMD paid online and proof should be attached along with techno-commercial bid.
 - d) It is accompanied by the power(s) of attorney as specified;
 - e) It contains all the information (complete in all respects) as requested in this Bidding Documents (in formats same as those specified);
 - f) It does not contain any condition or qualification or deviations.
- 14.3. DLCSUPVA reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by the Company in respect of such Bid.
- 14.4. DLCSUPVA may waive any minor informality, non-conformity or irregularity in a Bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

- 14.5. Prior to the detailed evaluation, the DLCSUPVA will determine the substantial responsiveness of each Bid to the Bidding Documents. A substantially responsive Bid is one which conforms to all the terms and conditions of the Bidding Documents without deviations. The Company's determination of a Bid's responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.
- 14.6. If the Bid is not substantially responsive, it will be rejected by the DLCSUPVA and may not subsequently be made responsive by the Bidder by correction of the nonconformity.

15. EVALUATION OF PRICE BID

This e-tender is floated in two-bid system i.e. technical bid & price bid. Technical bid will be first opened on scheduled date and will be evaluated as per the terms and conditions of the tender. Price bids of the technically qualified bidders will be opened on a notified date.

Bidders has to quote his rates for HSR item & NS item wise including GST & all other taxes.

Tender Evaluation: Tender cannot be split; hence DLCSUPVA intends to obtain the referred services from a single qualified party based on the lowest total financial outgo to the University, based on the rates quoted by them in the price bid.

Ranking Procedure: L1, L2, L3 ... etc. shall be decided on net landed cost based on rates quoted in the Price Bid and shall be tabulated in ascending order to determine ranking of each bidder.

Bidders are informed that Reverse Auction will be conducted for finalizing this Tender. DLCSUPVA reserves the right to conduct price negotiation with overall L1 bidder based on price quoted in BOQ.

DLCSUPVA will negotiate with Lowest one (L-1) only. In case of tie between two or more bidders at L-1 position, all the L-1 bidders shall be asked to submit discount in terms of percentage discount over previous quoted amount in a sealed envelope. It will be an offline activity outside the E-portal. The bidder with the further highest discount will be considered as L-1.

In case there is a tie again, the bidder with the highest turnover in any of the last 3 years as submitted against turnover criteria shall be considered as L-1 bidder.

During evaluation of technical bids and opening of price bids of the bidders participated in the tender, if it is found that any bidder is Blacklisted / Debarred by Central/State Govt./PSU/Corporation and then bid of such bidders will be ignored & will not be further evaluated. The bidder will not be considered for issue of order even if the party is the lowest (L1) and BG/EMD made by the party shall be returned. In such situation next lowest shall be considered as L1.

The procedure for evaluation of tenders shall be as follows:

1. Only the Technical Bid, of those parties uploading their tenders before due date and time of

submission, shall be considered for opening.

2. The techno-commercial bid shall be scrutinized & evaluated based on the qualifying parameters mentioned elsewhere in DNIT and on the basis of the uploaded documents (for PQC as well as other mandatory documents) in e-tender portal.
3. The Price Bid of only those parties shall be opened who qualify as per the qualifying parameters after evaluation as mentioned above. Prior intimation will be sent to the qualifying parties regarding due date and time of opening of Price Bid.
4. The tender will be allotted to overall lowest bidder only. However, owner can ask price bifurcation of all items.
5. The overall lowest quoted rates will be considered as lowest one (L-1).

Negotiations shall not be conducted with the bidders as a matter of routine. However, DLCSUPVA reserves the right to conduct negotiations with L-1. Tenderers will have to attend the Office of DLCSUPVA as informed by Tender Issuing Authority for negotiations/clarifications as required in respect of their quotation without any commitment from DLCSUPVA.

16. PRE- PRICE BID MEETING

Pre-price bid meeting shall be held as a prelude to price bid opening, only if required by any technically qualified bidder to resolve outstanding issues, if any. The date and time of meeting shall be finalized on receipt of request for the same from a technically qualified bidder and the date and time of meeting shall be conveyed to all the technically qualified Bidders. Representatives of the bidders shall attend the pre-price bid meeting for resolving outstanding issues and for other mutual clarifications.

17. APPLICABLE LANGUAGE

The bids and all correspondence incidentals concerning to this bid shall be in English language only. For documents submitted in any other language, an English Translation shall also be submitted, in which case, for interpretation of the offer, the English Translation shall govern.

18. BID CLARIFICATION/ AMENDMENTS BY DLCSUPVA

Addendum/ Clarifications may be issued prior to the date of opening of the tender to clarify issues arising out of various queries/ clarifications relevant to the tender documents from Tenderers or to reflect modification in the design or contract terms. Such addendum issued shall be part of bid document and bidders are advised to visit the university website as well as e-tender regularly for the same and downloading the tender document. Each recipient shall retain one copy of such addendum for submission along with the tender in acknowledgement of receipt thereof. All such addendum issued shall form part of the tender document.

If a party does not view/ fails to view the addendum / clarification hosted on the website on any accounts whatsoever and their offer is without considering the addendum / clarification, then DLCSUPVA may reject the offer.

All questions and clarifications related to Bidding documents shall be addressed in writing to:

1. Sh. Balbir Singh Sheokand
Consultant University Engineering Wing
Contact: 9416238633
Email:- uew@plcsupva.ac.in
2. Sh. Sanjay Kumar
SDE (Electrical)
Contact: 9306363112
Email: sde.electrical@plcsupva.ac.in

19. CONFORMITY TO TERMS AND CONDITIONS OF BID DOCUMENTS

Bids shall be based strictly on the terms, conditions and specifications contained in the Bid documents. Any deviation and exceptions taken to terms and conditions of the Bid documents is not allowed.

All correspondences from DLCSUPVA regarding clarifications during techno-commercial evaluation of the bid and mutually accepted deviations to tender document shall be concluded as “Agreed Variations”. The “Agreed Variations” shall form part of the contract and all other correspondences in this regard will be treated as null and void.

Bidder shall, however, confirm compliance to following Bidding document clauses unconditionally and no deviation whatsoever to the following clauses shall be acceptable:

- I. Bid Validity
- II. Termination of Contract
- III. Penalty due to delay in works
- IV. Arbitration
- V. Earnest Money Deposit/ Bid Security
- VI. Suspension of work
- VII. Performa of all Bank Guarantees

20. TERMS OF PAYMENT

Payment shall be made as per clause 12 of SCC (Chapter-4).

21. MOBILIZATION ADVANCE

Mobilization advance shall not be admissible in this contract.

22. COST OF BIDDING

The bidder shall bear all costs associated with the preparation and submission of bid and DLCSUPVA will in no case be responsible or liable for these works, regardless of the conduct of outcome of the bidding process.

23. CURRENCIES AND PAYMENT

- 23.1. Bidders shall quote their prices in Indian Rupees only.
- 23.2. All payments will be made in Indian Rupees only. In case bidders are required to pay any amount in foreign exchange to their sub-Contractor or for any imported items, necessary arrangement for such foreign exchange payment shall be made at their end. Payment shall be released through e-banking only. Bidder shall submit the bank details for e-payment.
- 23.3. The payments would be made after applicable tax deductions at source.
- 23.4. No advance of any sort shall be payable under this Tender.

- 23.5. The agency shall submit bill(s) in the format prescribed by DLCSUPVA.
- 23.6. DLCSUPVA shall effect payments to the vendors through cheques or e-payments at its discretion, during operation of the said contract/PO/WO. For this purpose, the bidder shall provide his bank details in the format enclosed as Annexure-13.
- 23.7. DLCSUPVA shall release the payments within 45 days of submission of bills complete in all respect, subject to acceptance of the work by DLCSUPVA. However, no claim will be paid on this account if payment becomes late due to whatsoever reasons or due to procedure.

24. NEGOTIATIONS

Negotiation shall not be done as a matter of routine. However, DLCSUPVA reserves the right to conduct negotiations with the lowest bidder.

25. PLACE OF PAYMENT

The payments shall be released through e-payment (RTGS) in Indian Rupees by DLCSUPVA. The name of paying authority shall be informed at the time of award of contract. Contractor shall raise all the bills in the name of Registrar, DLCSUPVA, Rohtak specific to as mentioned in the Letter of Award (LoA) and/or Contract Agreement.

26. MODIFICATION AND WITHDRAWALS OF BIDS

Bids can only be submitted / resubmitted before the last date and time of submission as per tender. Bids cannot be withdrawn after last date and time of submission as per tender.

27. CLARIFICATIONS OF BIDS

To assist in the examination, evaluation and comparison of bids, the DLCSUPVA may ask the bidders individually for clarification of their Bids, including break-down of unit rates. The request for clarification and the response shall be in writing through e- Tender portal only, but no changes in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of errors discovered by the DLCSUPVA during the evaluation of bids.

28. AWARD OF WORK

- 28.1. The work shall be awarded to a single agency at the discretion of DLCSUPVA to the techno-commercially acceptable L-1 bidder on duly negotiated rates.

29. PROHIBITION OF ENGAGEMENT OF CHILD LABOUR

The contractor shall state that they are not engaging child labour as per various labour laws applicable to them. Making a fake claim would have its contract terminated forthwith, if detected later. It is mandatory for the Contractor to submit an undertaking as per attached Performa (Annexure-5) for non-engagement of child labour given.

30. CONTRACT AGREEMENT

- 30.1. The entire work covered in the Bidding Document shall be treated as EPC Contract. Bidder should quote for the work accordingly.
- 30.2. The Bidder whose bid has been accepted by DLCSUPVA shall enter into formal agreement with DLCSUPVA (as per Performa enclosed in this bid document as Annexure-12) within 21

days of the issue of acceptance or letter of award by DLCSUPVA whichever is earlier.

- 30.3. Contract documents for agreement shall be prepared after award of work as intimated to the successful bidder by a Letter of award. Until the final contract documents are prepared and executed, the bidding document together with the annexed documents, modifications, deviations agreed upon by DLCSUPVA and Bidder's acceptance thereof shall constitute a bidding contract between the successful Bidder and DLCSUPVA.
- 30.4. The statement of Agreed Variations, if any, shall be prepared based on the finally retained and agreed deviations, all relevant correspondences, minutes of meetings, addendum/ amendments issued by DLCSUPVA prior to issue of Letter of award. Any deviations of stipulations made and accepted by DLCSUPVA after award of the job shall be treated as amendments to the contract documents made as above.

31. INDIGENISATION

Bidder shall make maximum possible utilization of indigenous manufacturing facilities and other services/ expertise available for their project implementation plans. It is, therefore, essential that as a preliminary exercise, bidders should explore potential available indigenously for utilization of manufacturing facilities and other various products/ equipment/ material of Indian origin conforming to specifications as well as construction expertise available indigenously and associate experienced Indian Agencies under overall supervision.

32. SUBCONTRACT

The Bidder shall obtain DLCSUPVA's prior approval in writing before entering into a Sub-contract for the performance of any part of the Services, it being understood (i) that the selection of the Sub-Contractor shall have been approved in writing by the DLCSUPVA prior to the execution of the sub-Contract, and (ii) that the contractor shall remain fully liable for the performance of the Services by the Sub-Contractor and its Personnel pursuant to this Agreement.

CHAPTER 5
SPECIAL CONDITION OF CONTRACT (SCC)

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1. GENERAL

- 1.1. Special Conditions of Contract (SCC) shall be read in conjunction with the General Conditions of Contract (GCC), Job Specifications, drawings and any other document forming part of this contract, wherever the context so requires.
- 1.2. Notwithstanding the sub-division of the documents into these separate parts and volumes, every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the contract in so far as it may be practicable to do so.
- 1.3. Where any portion of the GCC is repugnant to or at variance with any provision of the SCC, then the provision of the SCC shall be deemed to override the provisions of the GCC and shall, to the extent of such repugnance or variations, prevail.
- 1.4. Wherever it is mentioned in the specifications that the Contractor shall perform certain works or provide certain facilities, it is understood that the Contractor shall do so at his own cost, being deemed to be part of the relevant item in the SCHEDULE OF RATES / BOQ (SOR) whether expressly stated or not.
- 1.5. The materials, design and workmanship shall satisfy the relevant Indian Standards, the specifications contained herein and codes referred to. Where the specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.
- 1.6. In so far as the contract does not deal with or provide by expression or implication for any aspect or specification with respect to the product(s) or any of them or with respect to any other matter or thing required to be furnished, done or supplied relative thereto or for the delivery thereof according to the contract, the internationally accepted relevant specification, standard of workmanship and/or codes or practices, as the case may be, shall apply. In the event of any doubt or ambiguity relative thereto, the Contractor shall seek the clarification of DLCSUPVA.

2. DEFINITIONS

The following expressions hereunder and elsewhere in the Contract documents used and their grammatical variations shall unless repugnant to the subject or context thereof, have the following meanings hereunder respectively assigned to them, namely:

- 2.1. "Bidder / Tenderer" shall mean the company, who has submitted their bid individually, against this tender document to DLCSUPVA and includes the Bidders' legal representative, his successors and permitted assignors.
- 2.2. "BOQ" shall mean Bill of Quantities.
- 2.3. "Contractor" means any person, company, firm or body who may be engaged by the DLCSUPVA for works and services connected with the Project.
- 2.4. "Engineer In-charge (EIC)" shall mean Engineer responsible for the execution of the work of Solar PV Power Project i.e. Consultant (UEW).
- 2.5. "GCC" shall mean General Conditions of Contract.
- 2.6. "DLCSUPVA" shall mean Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana)
- 2.7. "PGT" shall mean Performance Guarantee Test as described in Clause 10.4
- 2.8. "PMC" shall mean Project Management Consultant.
- 2.9. "SCC" shall mean Special Conditions of Contract.
- 2.10. "SOR" shall mean Schedule of Rates.

3. BRIEF SCOPE OF WORK

DLCSUPVA intends to select and appoint one of the empaneled Vendors/Contractors of MNRE/SECI through competitive bidding in two-bid system (i.e. PART-I : Techno-Commercial Bid and PART-II : Price Bid) brief Scope of Work shall be as mentioned hereinafter but not limited to the following:

- 3.1. Part-A - Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

4. SITE DETAILS

4.1. Site location and access

S.No.	Location	Address
1	Rohtak (Haryana)	DADA LAKHMI CHAND STATE UNIVERSITY OF PERFORMING AND VISUAL ARTS, Sector-6, Rohtak

4.2. Space availability and site description

Adequate space on rooftop of various departments is available for solar PV field block, inverters, cabling etc. A rough layout of rooftop available for solar PV field block is attached with bid documents (Any additional details about the proposed site which needs to be taken care will be provided before/at the time of execution of work).

5. EXISTING ELECTRICAL SYSTEM AT PLANT

5.1. Power Supply Distribution System

All the feeders are fed through a 415V LT bus which is being fed by Grid or Diesel Generators. The contract demand is 2000 KVA.

- 5.1.1 **Approximate 164kWp solar power plant has already been installed on roof top of Design department building and the same will be integrated with new one, if required.**

6. INPUTS PROVIDED BY DLCSUPVA

- 6.1. Indicative site layout, attached as Annexure-16.

7. CONTRACTOR SUPPLIED MATERIAL

- 7.1. All the equipments, materials, field instruments, consumables, etc. which are not specifically indicated in DLCSUPVA's Scope of Supply but are required for successful completion of the works as per specification, drawing, construction methodology etc., shall be included in the Contractor's Scope of Supply.
- 7.2. All materials required for the civil works including cement, reinforcement, structural steel, sheeting, consumables, testing appliances, tools and tackles necessary for completing the work shall be supplied by the contractor at his own cost and shall conform to the job specifications and SCHEDULE OF RATES/ BOQ. No claim/ delay on this account will be entertained by the DLCSUPVA.

- 7.3. The Contractor shall ensure that only the qualified and experienced subcontractor(s) are appointed by him for discharge of work or part thereof. The Contractor may appoint subcontractors for various works from DLCSUPVA approved vendors / subcontractors for certain materials / services. For other vendors/subcontractors contractor may seek approval of EIC.
- 7.4. All expenses towards mobilization at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site after completion of work and liaising with the State Grid and other concerned departments, if required, etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.
- 7.5. Contractor may have to work in energized or partly energized conditions. In such cases, it shall be the responsibility of the Contractor to arrange for necessary permits or shut downs and provide skilled and responsible persons for the execution of works. Contractor shall organize his works during the shutdown periods properly and complete the programmed works within the time given. Contractor shall not be paid any extra payments for working under the above said circumstances.
- 7.6. It shall be entirely the Contractor's responsibility to provide, operate and maintain all necessary construction equipments, scaffoldings and safety gadgets, cranes and other lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all the jobs as per time schedules. However, if any equipment/ facility are provided by DLCSUPVA, the same shall be on chargeable basis.
- 7.7. Procurement and supply, in sequence and at the appropriate time, of all materials and consumables shall be entirely the Contractor's responsibility and his rates for execution of work will be inclusive of supply of all these items.

8. TIME SCHEDULE

- 8.1. Commissioning of the full capacity within 4 months from the date of Letter of Award. The date of commissioning shall be considered as defined in Clause 31 of this chapter.
- 8.2. Performance Guarantee Test within 12 months from the date of project commissioning.
- 8.3. The contractor shall submit a detailed PERT chart/BAR chart or any other project progress monitoring tool in line with the proposed time schedule covering all activities with various key phases of supply and service obligations under the contract such as supply schedule and field erection activities within fifteen (15) days of the date of LOA.
- 8.4. The time of commissioning / acceptance shall be inclusive of time for mobilization, engineering, approval of the design & other materials and intervening monsoon, if any.

9. WORK SCHEDULE

- 9.1. Upon award of work, the Contractor shall provide detailed work schedule to the Engineer-In-Charge (EIC) covering all activities related to supply, installation, testing and commissioning falling under the scope of work.
- 9.2. There would be a kick-off meeting with the contractor within 1 week from date of LOA, or on a later date as decided by EIC, where in the contractor would present the detailed action plan, work plan schedule, critical/long delivery item plan, etc.
- 9.3. Detailed Timelines for work completion shall be discussed and finalized by Contractor after Award of Work.

10. GUARANTEES

10.1. Performance Security Deposit

- 10.1.1 In partial modification of Clause 2.1.0.0 & Clause 4.4.0.0 of the General Conditions of

Contract, the Contractor shall within 21 days from the date of issue of the LOA, furnish Performance Security Deposit for an amount equivalent to 5% of the work order value towards Contract Performance Guarantee (PG) for commissioning of the full capacity of the project, establishment of PGT. Performance Security Deposit may be furnished through Bank Guarantee (BG)/FDR from any nationalized / scheduled Bank in the prescribed format (Annexure-11), provided the amount as specified above.

- 10.1.2 If the total value of the Guarantee amount becomes deficient at any time till commissioning of project, the Contractor shall make up the deficiency within 10 (ten) days of such occurrence, by paying (or furnishing a BG in case Performance Security Deposit was furnished through BG) for the deficient amount, failing which, the DLCSUPVA shall be entitled to make up the deficiency by adjustment recovery from the Running Bills or any other amount payable.
- 10.1.3 BG, if applicable, shall be submitted by the Contractor as per format given in Annexure-11 from any scheduled bank in India or any foreign bank operating in India under the rules of Reserve Bank of India.
- 10.1.4 Performance Security Deposit shall be returned to the Contractor after the validity is over and all the obligations of the contractor under the contract have been met.
- 10.1.5 If the completion of work is delayed beyond schedule the DLCSUPVA will recover the penalty as described in Clause 38 from pending bills, if any, else through PSD submitted by the Contractor.

10.2. Defect Liability Period

In partial modification to clause 5.4.1.0 of GCC, the defect liability period for the works (including the materials incorporated therein within the Contractor's scope of supply) shall be 24 (Twenty Four) months from the date of project commissioning as defined in Clause 31.

10.3. Manufacturer's warranty

- 10.3.1. The manufacturer's warranty for all bought out items shall be made available to the DLCSUPVA and shall be valid for the entire defect liability period. However, this does not absolve the Contractor of his responsibilities under defect liability clause to perform in attending to the defects noticed and rectifying these without any delay.
- 10.3.2. Manufacturer's/Contractor's warranty, for any replaced item shall also be made available to the DLCSUPVA and shall be kept valid for the original warranty period.
- 10.3.3. Guaranteed performance data as required in the specifications shall be included as part of the contract. The Contractor shall furnish further, such data and this shall form a part of the contract document.
- 10.3.4. The Contractor shall warrant that the goods supplied will be new and in accordance with the Contract Documents and be free from defects in material and workmanship. The Contractor shall further warrant that the Goods supplied under this contract shall have no defects arising from design, material or workmanship or from any act or omission of the Contractor, which may develop under normal use of the supplied goods in conditions obtaining in the country of final destination.
- 10.3.5. The Contractor shall replace/ repair to the satisfaction of the DLCSUPVA any defective parts in the Goods of his own manufacture or those of his subcontractor's under normal use and arising solely from faulty design, materials and/or workmanship.
- 10.3.6. If it becomes necessary for the Contractor to replace or renew any defective equipment/

component/ part/ material of the Solar PV Plant (during the warranty period), the provision of this Clause shall apply to items so replaced or renewed until the expiration of defect liability period. If any defects are not remedied within thirty (30) days from the date of notice by the DLCSUPVA, DLCSUPVA may proceed to do the work at the Contractor's risk and cost, but without prejudice to any other rights, which the DLCSUPVA may have against the Contractor in respect of such defects.

- 10.3.7. The repaired or new parts will be furnished and erected free of cost by the Contractor. If any repair is carried out on his behalf at the Site, the Contractor shall bear the cost of such repairs.
- 10.3.8. The cost of any special or general overhaul rendered necessary during the maintenance period due to defects in the plant or defective work carried out by the Contractor, the same shall be borne by the Contractor.
- 10.3.9. The acceptance of the Goods by the DLCSUPVA shall in no way relieve the Contractor of his obligation under this clause.
- 10.3.10. Timely replacement/ repair of the defective part would be at contractor's cost.
- 10.3.11. At the end of the warranty Period, the Contractor's liability ceases except for latent defects.
- 10.3.12. The Photo-voltaic Modules shall be warranted for 12 years for product and 25 years for performance from date of commissioning and the inverters for 10 years, as per configuration defined in Clause 2.1.1 of Chapter-5.
- 10.3.13. All photovoltaic modules should carry a linear performance warranty from second year. The solar PV modules offered should not degrade more than 1% for first year and not more than 0.4% p.a. from 2nd year to 25 years of its rated power.

10.4. Performance Guarantee Test (PGT)

10.4.1. Solar PV System

The performance of the solar PV system installed shall be successfully established through achievement of minimum Generation Guarantee value as described in Annexure-

17. The contractor shall have to establish the successful PGT of installed system within 12 months and 24 months from the date of project commissioning. Yearly Performance Evaluation

10.5.1. Solar PV System

The performance of the solar PV system shall have to be established through achievement of minimum Generation Guarantee value as described in Annexure-17 every year during the execution of the contract as described in Clause 3 of SCC.

11. SCHEDULE OF RATES / BOQ

- 11.1. All the items of work mentioned in the SCHEDULE OF RATES / BOQ and covered by the Contract shall be carried out as per the drawings, specifications and under the direction of EIC and shall include all costs/expenses including equipment, labour, logistics, transport, travel & stay arrangements, attending meetings, presentations at DLCSUPVA office, collection of necessary data, other incidentals including supply of materials, etc. as may be necessary for

rendering the services in totality as per detailed technical specifications of the Tender. The Contractor shall be and remain at all-time exclusively responsible to provide all material, consumables, labour supervision, equipment tools machines, permits, licenses, casements and facilities and other items and things whatsoever required for or in connection with the work, included but not limited to those indicated by expression or implication in the SCHEDULE OF RATES/BOQ, Technical Specification, approved designs, plans, drawings and/or other Contract documents or howsoever otherwise required either for incorporation within the permanent works or in relative to the execution and performance of the work. The format for schedule of rate can be found in Chapter-8 of Part I for reference and no quotes are to be filled in the same. The quotes are to be filled in format given in Part-II of this Tender document.

- 11.2. The rates stated in the SCHEDULE OF RATES / BOQ shall not be subject to escalation or increase on any account whatsoever, other than taxes and duties as mentioned in Clause 18 of this Chapter.
- 11.3. Complete contents of the Price Bid / SOR shall be made available in the un-priced offer with the words "Quoted" (but not the actual prices) at the places wherever prices are there in the priced part of offer. If the price quote is made in the un-priced offer, the bid shall be liable for rejection.
- 11.4. The Bidder shall quote prices for the total services.
- 11.5. The breakdown of materials pertains to supply of major items. It will be the responsibility of the bidder to supply all materials/ Equipments required for completion of work as per contract, irrespective of whether all items are identified in Schedule of Rates / BOQ.

12. TERMS OF PAYMENT

Payment will be made for the items on each stage of payment as indicated hereunder and shall be applicable only when the work has been accepted in accordance with the tender specification up to that particular stage.

The DLCSUPVA shall pay the Contractor in the following manner and at the following times, on application for payment by the Contractor as work proceed.

12.1. PART A: SOLAR POWER GENERATING SYSTEM

A. PART A (1): Supply of Plant & Equipment including Spares and Allied Services of Installation & Civil / Other Works

In respect of this item payment shall be claimed as below:

% of contract price of SOR / BOQ item	Milestone
Thirty Percent (30%)	On receipt, physical inspection, certification and acceptance of equipment at site for Solar PV Modules (including mandatory spares) received and stored at site.
Five Percent (5%)	On receipt, physical inspection, certification and acceptance of equipment at site for Module Mounting Structure received and stored at site.

Fifteen Percent (15%)	On receipt, physical inspection, certification and acceptance of equipment at site for Power Conditioning Unit/Inverter received and stored at site.
Five Percent (5%)	On receipt, physical inspection, certification and acceptance of equipment/material at site for Cables (AC and DC), and ACDB/Switchgear received and stored at site.
Four Percent (4%)	On completion of entire Module erection.
Four Percent (4%)	On Placement/Installation of Inverter(s) and Batteries, if applicable.
Two Percent (2%)	On Placement/Installation of ACDB/Switchgears.
Three Percent (3%)	On completion of Cable (AC and DC) laying.
Two Percent (2%)	On completion of all other allied civil/mechanical/electrical works.
Twenty percent (20%)	On successful Project Commissioning as described in Clause 31 of Chapter-4.
Five percent (5%)	On successful completion of PGT as described in Clause 10.4 of Chapter-4.
Five Percent (5%)	On successful establishment of Net Metering, if applicable as per applicability defined in Clause 39 of Chapter-4. If Net-Metering is not applicable for this project as per Clause 39 of Chapter-4, this amount shall be paid on successful project commissioning as described in Clause 31 of Chapter-4.

13. CONDITION OF WORK SPECIFIC REQUIREMENTS

13.1. Civil works

- 13.1.1. The contractors must note that relevant codes shall be made available at site for reference whenever demanded.
- 13.1.2. Contractors must note that sufficient provision of shuttering materials is made available at Site including implements and equipment.

13.2. Electrical works

13.2.1. Code Requirements

The electrical works shall comply with all applicable statutory regulations comprising of but not limited to the following: -

- i) Indian Electricity Rules 1956, Electricity act 2003, Grid Code
- ii) Any other statutory Body/ Authority

13.2.2. Statutory Clearances

The contractor has to obtain all the clearances as per the requirements of State Nodal Agency.

13.2.3. Commissioning/operation

The contractor shall provide labour & equipments/ machinery for testing and commissioning of the entire system.

The Contractor at his own cost and without delay to suit the commissioning programme shall carry out rectification of defect in any work done by the Contractor.

13.2.4. Electrical Inspector's Approval/ Completion/Acceptance/ Performance Test/ Third Party Verification

The contractor shall produce license secured from State Electricity Board to the EIC for verification, wherever required. Contractors have to perform the job with qualified personnel recognized by the Electricity Board inspectorate. For this purpose, contractor shall furnish the details pertaining to supervisory competence certificate and wiremen license of concerned workers for carrying out electrical works as they will be actually engaged in the daily execution of the job. On completion of electrical installation, the contractor shall furnish the completion certificate to the Electrical Inspectorate, if required. The certificate shall be prescribed in the form as required by the local inspectorate, if required. The Contractor shall approach the Inspectorate and arrange for inspection, seek approval in writing before starting up of the testing work and also before commissioning the installation. However, the necessary fee paid to Inspectorate shall be reimbursed by the DLCSUPVA on submission of actual receipts.

The third party may verify the construction works/operation of the Power Project being carried out and if it is found that the construction works/ operation of the Power Project is not as per the Prudent Utility Practices or industry/project benchmark, it may seek clarifications or require the works to be stopped or to comply with the instructions of such third party.

13.3. Standardization

Installation methods and procedure for equipment supplied by the contractor shall conform to standard design and shall be uniform. Particularly for cable jointing, fixing labels, cable gauging and supports, termination etc. so that installations are uniform in appearance.

13.4. Workmanship (General)

Electrical equipment shall be installed and electrical work undertaken by qualified and competent tradesman/ supervisors. Manufacturer's installation instruction and recommendations shall be closely followed at all times. Particular care shall be taken with transformers, switchgears and other equipment to ensure that the metal joints are clean and that safe gaps are not exceeded. Adequate weather protection during installation shall be provided at all times.

14. TEST, INSPECTION AND PERFORMANCE OF WORKS

14.1. The Contractor shall submit all relevant Type & Routine Test Certificates, duly certified by OEM or NABL Lab.

14.2. All the tests either on the field or at outside laboratories concerning the execution of the work and supply of materials by the Contractor shall be carried out by Contractor at his own cost. All test equipment including all recording/ measuring gauges/ instruments shall be calibrated

and necessary certificate of compliance issued by the Statutory agency/body to the effect that the test equipment's /instruments have been calibrated as per standard practices and found meeting the norms shall have to be furnished by the Contractor. The entire cost of carrying out such calibration and furnishing of the compliance certificate from a Statutory Authority/body shall be at the expense of the Contractor.

- 14.3. The work is subject to inspection at all times by the DLCSUPVA/ EIC. The Contractor shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications, the technical documents and the relevant codes of practice furnished to him during the performance for the work. Contractor shall discuss his daily work programme with EIC before starting the same every day.
- 14.4. Any work not conforming to the execution drawings, specifications or codes shall be rejected forthwith and the Contractor shall carry out the rectification at his own cost.
- 14.5. All results of inspection and tests will be recorded in the inspection reports, proforma of which will be approved by the EIC. These reports shall form part of the completion documents.
- 14.6. In addition to the provisions of clause 5.2.0.0 of GCC, on no account shall the Contractor proceed with the backfilling or other underground works by covering up or otherwise placing beyond reach of inspection or measurement before inspection by the EIC or his authorized representative. Should the Contractor do so, the same shall be uncovered at Contractor's risk and expense for carrying out the inspection and measurement.

15. SETTING OUT OF THE WORKS

- 15.1. The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position and levels, dimension and alignment of all parts of the works and for the provision of all necessary instruments, appliances and labour in connection therewith.
- 15.2. If at any time during the progress of the work, shall any error appear or arise in the position, level, dimension or alignment of any part of the works, the Contractor shall at his own expense rectify such error to the satisfaction of EIC or the Site Engineer.
- 15.3. The checking of any setting-out or of any line or level by the EIC or the Site Engineer shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks, pegs and other things used in setting out the works.

16. WATER & POWER SUPPLY

- 16.1. In partial modification of the provisions of clause 3.4.0.0, 3.5.0.0 & sub clauses thereof of the GCC, the contractor shall arrange construction water/ procure water required for the work at his own cost. DLCSUPVA shall not be responsible for supplying water and Contractor shall ensure timely and adequate supply of water to meet the schedule.
- 16.2. DLCSUPVA may extend power for construction on payment basis, if requested by the contractor after award of work. However, required cabling work and installation of 0.5 Class Energy Meter shall be in scope of Contractor at his own cost.
- 16.3. The electrical works shall be carried out through licensed electrical personnel only.

17. PERSONAL ACTS & LIABILITIES

Any money paid to any director, attorney, agent, officer or employee of the Contractor and any receipt, settlement, acknowledgement of liability or other arrangement, agreement or document whatsoever signed by any such director, attorney, agent, officer, or employee of the Contractor or erstwhile director, attorney, agent, officer or employee of the Contractor (without notice of his cessation of interest) or by any person held out to be a director, attorney, agent, officer or employee of the Contractor authorized to act on behalf of and/or to bind the Contractor, shall be binding upon the Contractor and shall constitute a full release and discharge to the DLCSUPVA and/or settlement, acknowledgement or obligation of, upon or with the Contractor, as the case may be, and the DLCSUPVA shall not be concerned with the actual application of any money so paid or of the actual authority of such director, attorney, agent, officer or employee (actual, erstwhile or purported as the case may be) vis-à-vis the company to make the settlement, receipt, acknowledgement, agreement or other document concerned.

18. PRICES, TAXES AND DUTIES

- 18.1. The contract price shall be exclusive of applicable Goods & Service Tax (GST) and shall remain fixed and firm for contract period and until completion of performance of contract and its acceptance by DLCSUPVA.
- 18.2. All tax invoices raised by the Contractor as per the outward return would have to be matched with DLCSUPVA's inward return.
- 18.3. Contractor shall raise its invoices as per the format prescribed under the Goods and Services Tax Act and GST Rules. Contractor shall further ensure necessary compliances with the Goods and Services Tax Act and the GST Rules to facilitate the receipt of Input Tax Credit by DLCSUPVA. Contractor shall indemnify DLCSUPVA on account of non-compliance in this regard for any loss of tax credit, tax, interest, penalty etc. liability imposed by tax authorities.
- 18.4. In case of un-registered vendor under GST, the recipient of services that is, DLCSUPVA as buyer shall be liable to issue tax invoice on behalf of the vendor and shall be liable to deposit the applicable taxes / GST under reverse charge.
- 18.5. Under GST law, if any composite supplier that is, Contractor raises tax invoice to purchaser that is, DLCSUPVA and DLCSUPVA is unable to take input tax credit, in such cases the Contractor will indemnify DLCSUPVA against such tax credit losses.
- 18.6. Bidder agrees to pay all taxes which are based on or determined by reference to its income or that of its personnel and services and will hold harmless and indemnify DLCSUPVA from all claims, taxes, penalties, fines, interest and other costs which may be made or assessed against the Bidder with respect to the performance under this Contract or with respect to personnel of the bidder and its sub-contractors. The indemnities under this clause shall survive the term of this Contract by a term equal to the length of time allowed by statute. For the purpose of this clause, the benefit of any indemnity given in favour of the DLCSUPVA shall include its personnel, sub - contractors, joint venture partners, associates, affiliates and agents.
- 18.7. DLCSUPVA may deduct or withhold sums from payments to be made by DLCSUPVA to the contractor to the extent that such deduction or withholding may be required by applicable law, orders, rules or directions of any competent taxing authority. The rates and prices set forth in this Contract shall be inclusive of any taxes required to be deducted or withheld.
- 18.8. New Taxes: In the event that there is any new indirect tax, introduced as a result of a new legislation, after the bid closing date, DLCSUPVA shall compensate the Bidder for such new tax, provided that the Contractor can substantiate the same with adequate documentation.

- 18.9. Any increase / decrease in such taxes after the date of submission of price bid but within the contractual completion / mobilization date as stipulated in the Contract will be to the account of DLCSUPVA.
- 18.10. Any increase in the duties and taxes after the contractual completion / mobilization date during the extended period will be to the Contractor's account, where delay in completion /mobilization period is attributable to the Contractor. However, any benefit of decrease in duties and taxes after the contractual completion / mobilization date will be passed on DLCSUPVA.

19. INSURANCE

The contractor shall arrange insurance to cover all risks in respect of personnel, materials and equipment belonging to the contractor or its subcontractor during the currency of the contract. The contractor shall indemnify DLCSUPVA for all the losses, if any, during contract period.

19.1. Insurance during Supply, Erection and Commissioning

- 19.1.1. Contractor shall at his own expenses effect insurance to the supplies, transit, personnel and all other related activities to the satisfaction of the DLCSUPVA as follows including all third-party risks. A copy of all such policies will be given to the DLCSUPVA. DLCSUPVA shall be informed of such insurance policies. The policy shall remain valid until issue of Completion Certificate as described in Clause-32 of this chapter. Thereafter, DLCSUPVA shall maintain a comprehensive insurance policy for the plant.
- 19.1.2. Insurance to cover marine & transit insurance.
- 19.1.3. Insurance to cover storage cum erection cum commissioning policy with DLCSUPVA as beneficiary.
- 19.1.4. Insurance to cover third party liability along with an undertaking indemnifying DLCSUPVA from any such claim.
- 19.1.5. The insurance to cover any consequences arising out of pilferage, theft, burglary by the contractor.
- 19.1.6. Workmen compensation and /or group personal accidents Insurance policy covering its employees and workers including Sub contractor.
- 19.1.7. Contractor shall also effect and maintain any other insurance that may be required under any law or regulation or practice from time to time.
- 19.1.8. Contractor shall take all reasonable precautions to prevent fire of any nature in the general area of his operations and he shall be responsible for all damage from fires due directly or indirectly.
- 19.1.9. Contractor shall provide insurance, which shall cover among other things, fire, earthquake, and flood damage and deductibles thereon. Machinery breakdown insurance and deductibles / excess thereon for modules, inverters, other auxiliaries and complete Solar Power Project.

19.2. Transit insurance

- 19.2.1. Contractor shall at his own expenses effect insurance from Insurance Agencies to the supplies, transit, personnel and all other related activities to the satisfaction of the DLCSUPVA as follows including all third party risks. A copy of all such policies will be

given to the DLCSUPVA along with. DLCSUPVA shall be informed such insurance policies.

- 19.2.2. Insurance to cover marine, transit cum storage cum erection cum commissioning policy.
- 19.2.3. Insurance to cover third party liability of appropriate value along with an undertaking indemnifying DLCSUPVA from any such claim.
- 19.2.4. Contractor shall also effect and maintain any other insurance that may be required under any law or regulation or practice from time to time.
- 19.2.5. The Contractor shall take all reasonable precautions to prevent fire of any nature in the general area of his operations and he shall be responsible for all damage from fires due directly or indirectly.

20. PATENT INDEMNIFICATION

Further to General Conditions of Contract clause no. 8.10.0.0, Contractor shall indemnify the DLCSUPVA against all losses, costs, damages and expenses arising from any claim asserted against DLCSUPVA that the work or part thereof, or any methods, designs or things furnished or specified by Contractor or any sub-contractor or supplier under this Contract, or any use thereof in the reasonable contemplation of the parties at the time furnished, or any methods, processes or acts employed by Contractor in connection with the performance of its obligations hereunder constitutes an infringement of any patent, trade secret, proprietary information, know-how copyright (statutory or non- statutory), un-patented invention or any unauthorized use of the work of others.

21. RESTRICTION OF VISITORS

The Contractor shall not allow any visitors on the work or premises of the site without the approval of EIC and/ or site engineer.

22. SAFETY AND POLLUTION CONTROL

In addition to the provisions of clause 10.0.0.0 of GCC, the Contractor shall take all reasonable precautions to avoid pollution or contamination of the air, land or water arising out of the performance of the work. Disposal of returns and cuttings produced by the work shall not be allowed to be discharged in the river. Contractor shall make arrangement at his own cost and initiatives to dispose of the return and cuttings generated from the drilling operation, as to avoid any pollution to the environment. Should there be a discharge or escape of appreciable quantity of pollutants or contaminants during performance of its obligations under this contract which occurs as a result of activities of the Contractor or its sub-contractor, the Contractor shall immediately take all necessary actions to contain, control, recover or disperse the substance and to eliminate the safety and environmental risks and correct the damages resulting there from.

22.1. Adherence to safety procedures and practices

Contractor shall ensure that the prudent industrial safety measure, applicable to the plant as per the norms and statutory requirements are adhered to during the EPC as well as O&M phase. In case of accidents depending on the seriousness of injury etc. in addition to the hospitalization/ treatment charges and group insurance amount,

compensation shall be paid by the Contractor to the affected person/ his family members in presence of EIC as per Workmen Compensation Act.

22.2. Safety practices while working at height

Contractor shall ensure that the prudent safety measure, applicable to the plant as per the norms and statutory requirements are adhered to during the EPC.

23. NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK

If at any time from the commencement of the work, the DLCSUPVA shall for any reason whatsoever not require the whole work or part thereof as specified in the tender to be carried out or, alteration in the work are required, the EIC shall give notice in writing of the fact to the Contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full or prior to alteration.

24. CONTRACTOR'S REPRESENTATIVE DURING PROJECT EXECUTION

24.1. During project execution, the Contractor shall ensure responsible person with authority to take decisions to be available at site during working hours. Such person deputed by the Contractor shall report to EIC for smooth execution and timely completion of the work. The Contractor shall be responsible for any misconduct/ indiscipline by his employees or sub-Contractor/ agent employee's. The Contractor shall abide by the instructions of the EIC, if given in this regard.

24.2. EPC Contractor shall submit the Manpower Chart with hierarchy that would be deployed at site.

25. SUB-CONTRACTING OF WORK

Contractor shall not subcontract or assign, in whole or in part, its obligations to perform under this contract, except with DLCSUPVA's prior written consent. In the eventuality of sub-contracting of work, DLCSUPVA will be informed in advance. However, the Contractor's liability or obligations will not get altered/ delegated to sub-contractor. If any sub-contractor engaged upon the work at the site executes any work which in the opinion of the EIC is not in accordance with the contract documents, the DLCSUPVA may give written notice to the Contractor advising him to terminate such sub-contracts and the Contractor on the receipt of such notice shall terminate such contracts.

26. POWER OF ENTRY

26.1. In case the Contractor does not commence the work in the manner described in the contract documents or if he shall at any time in the opinion of the EIC:

- a) Fail to carry on the works in conformity with contract document/ schedule, or
- b) Substantially suspend work or the works for a continuous period of 14 days without permission from the EIC, or
- c) Commit or permit any other breach of any of the provisions of the contract on his part to be performed, or
- d) Abandons the works, or

e) During the continuance of the contract becomes bankrupt.

26.2. In any such events, the DLCSUPVA shall have the power to enter upon the works and take possession of the materials, temporary works, equipment, tools and stocks thereon, and to revoke the Contractor's order to complete the works by his agents, other Contractors or workmen.

27. USE OF COMPLETED PORTIONS

27.1. Whenever in the opinion of the DLCSUPVA, the work or any part thereof is in a condition suitable for use and in the best interest of the DLCSUPVA requires use, the DLCSUPVA may take possession of the same. The Contractor shall, however, be not relieved of his pending obligations.

27.2. Prior to the date of final acceptance of the work by the DLCSUPVA, all necessary repairs or renewals in the work or part thereof so used on account of defective materials or workmanship or due to the operations failure shall be at the expenses of the Contractor. Such use shall neither relieve the Contractor or any of his responsibilities under the contract, nor act as waiver by the DLCSUPVA of the conditions thereof. However, if in the opinion of the DLCSUPVA, the use of the work or the part thereof delays the completion of the remainder of the work, the DLCSUPVA may grant such extensions of time as it may consider reasonable. The decision of the DLCSUPVA in the matter shall be final. The Contractor shall not be entitled to claim any compensation on account of such use by the DLCSUPVA.

28. POWER OF THE ENGINEER-IN-CHARGE (EIC) TO ORDER SUSPENSION OF WORK

The EIC may, from time to time by direction in writing and without invalidating the contract, order the Contractor to suspend the work or any part thereof at such time or times and for such reasons as he may consider necessary. After such directions to suspend the work or any part thereof have been given, Contractor cannot then proceed with the work or part thereof, directed to be suspended, until he receives a written order from the EIC to proceed. In the event of suspension, the DLCSUPVA may under the provisions of the contract, extend the time for completion of the work or part thereof by such period as it may find reasonable. The decision of the DLCSUPVA in the matter shall be final and binding on the Contractor.

29. DEFECTS PRIOR TO TAKING OVER

29.1. If at any time before the work is taken over, EIC shall:

a) Decide that any work done or materials used by the Contractor or any sub-contractor is defective or not in accordance with the contract, or that the works or any portion thereof, are defective, or do not fulfil the requirements of contract (all such matters being hereinafter, called Defects in this Clause).

AND

b) As soon as reasonably practicable notice given to the Contractor in writing of the said decision specifying particulars of the defects alleged to exist or to have occurred, then the Contractor at his own expense and with all efforts shall make good the defects so specified.

29.2. In case the Contractor fails to do so, the DLCSUPVA may take, at the cost and risk of the

Contractor, such steps as in all circumstances be reasonable to make good such defects. The expenditure so incurred by the DLCSUPVA will be recovered from the amount due to the Contractor. The decision of the EIC with regard to the amount to be recovered from the Contractor will be final and binding on the Contractor. As soon as the works have been completed in accordance with the contract and have passed the tests on completion, the EIC shall issue a certificate in which he shall certify the date on which the works have been so completed and have passed the said tests and the DLCSUPVA shall be deemed to have taken over the works on the date so certified.

30. DEFECTS AFTER TAKING OVER

- 30.1. In order that the Contractor could obtain a completion certificate, he shall rectify any defect arising from the defective materials supplied by the Contractor or workmanship or any act or omission of the contract or that may have been noticed or developed after the works or group of the works has been taken over, the period allowed for carrying out such works will be normally 15 days. Normally it is expected that work will be completed within 15 Days. However, in case of unforeseen /genuine delay, EIC may take a call on this aspect whose decision will be final. If any defect be not remedied within period stipulated above, the DLCSUPVA may proceed to do the work at Contractors risk and expense and deduct from the final bill such amount as may be decided by the DLCSUPVA/EIC.
- 30.2. If by reason of any default on the part of the Contractor, a completion certificate has not been issued in respect of the works within one month after the date fixed by the Contractor for the completion of the work, the DLCSUPVA shall be at liberty to use the works or any portion thereof in respect of which a completion certificate has not been issued, provided that the works or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completion of these works for the issue of completion certificate.
- 30.3. All the aforesaid safeguards/ rights provided for the DLCSUPVA shall not prejudice its other rights/ remedies elsewhere provided herein and/ or under law.

31. PROJECT COMMISSIONING AND ACCEPTANCE

Project Commissioning:

Project commissioning shall be established when the entire plant capacity is synchronized to the captive load bus at DLCSUPVA Rohtak and installation of new Net Meter or synchronization with existing.

Project Acceptance:

The Contractor shall submit Acceptance Report of the project to DLCSUPVA after completion of the scope of work. The Report shall consist of the following documents:

- a) Establishment of net-metering facility/license, as per the applicability defined in Clause 39 of Chapter-4.
- b) Technical documents as per scope of work & technical specifications according to which the work has been carried out including but not limited to following;
 - i) Four sets of as built drawings showing therein modification and corrections, if any, made during the course of execution signed by the Contractor. A soft copy of as built drawings shall also be submitted (CAD, PDF and any other format as required).

- ii) Copy of complete layout of the solar array including power injection layout/ system.
- iii) Copies of test certificates for type/routine tests performed on major equipment.
- iv) O&M Manuals – 4 sets
- v) Copies of Statutory clearances / permissions.
- vi) Certificate/undertaking for making payment of all statutory requirements, duties, labour wages and others for having made payment.
- vii) An undertaking confirming the payment of all statutory duties, taxes or document(s) having evidence of paying statutory duties, taxes etc. as per requirement of concerned statutory authorities.
- viii) Certificate regarding completion of the facility in all respect by the EIC.
- ix) List of all mandatory spares which are duly tagged and stored.

Take over shall occur after the successful completion of Performance Guarantee Test (PGT) of the system (Solar PV system) and issuance of Final Acceptance certificate and, if and only if:

- i) A Performance Test Report has been prepared by the Contractor and accepted by the DLCSUPVA in accordance with the Contract,
- ii) All Permits required to operate and maintain the Plant have been obtained,
- iii) The Contractor has completed all the Scope of Work related to EPC works,
- iv) The Contractor has obtained the Commissioning Certificate for the Solar Plant.
- v) All sub-contractors have been paid the dues by the Contractor and no-dues certificates received from such sub-contractor.
- vi) All statutory or legal liabilities on account of the work performed under the contract have been duly calculated and paid by the Contractor,
- vii) All as-built drawings have been submitted to the DLCSUPVA,
- viii) Detailed Engineering document with detailed specification, schematic drawing, circuit drawing and test results, manuals for all deliverable items, Operation, Maintenance & Safety Instruction Manual and other information about the project have been submitted to the DLCSUPVA.

DLCSUPVA shall issue Acceptance Certificate after verifying from the documents and satisfying itself that the work has been completed in accordance with details set out in the construction and erection drawings and the contract documents. No Certificate shall be given nor shall the work be deemed to have been executed until the feeding of generated Solar power commenced to captive load bus, all statutory requirements are completed including net-metering, if applicable as per Clause 39 of Chapter-4, and all scaffolding, surplus materials and rubbish is cleaned off the site completely.

32. COMPLETION CERTIFICATE

DLCSUPVA shall issue Completion Certificate after satisfying itself that the work has been completed in accordance with details set out in the contract documents. No Completion Certificate shall be given nor shall the work be deemed to have been

executed until the following are ensured:

- a) Contractor submits the Acceptance Report of the project
- b) All DLCSUPVA's property and documents handed over to EIC
- c) And, fulfilment of all the requirement of 31 of SCC

33. STATUTORY / REQUIRED APPROVALS FOR WORKS

33.1. If Contractor chooses equipment/system/components of an equivalent make as given in Annexure-20, Contractor shall submit for DLCSUPVA approval a conformance certificate generated/certified from OEM/NABL/SECI/MNRE approved Laboratory certifying that the selected model of a particular make is compliant to the specifications outlined for that particular equipment/system/components in this Tender Document, before placement of Purchase Order for that equipment/system/components to an equivalent make manufacturer.

33.2. Statutory and other related approvals

The clearances/ approvals in respect of installation, testing and commissioning of the complete electrical and associated system would be obtained by contractor on behalf of the DLCSUPVA. DLCSUPVA would fill up the required forms and applications under the advice of the contractor for clearance from/for:

- a) State Power Utilities, if required
- b) State Renewable Energy Development Agency, if required
- c) Chief Electrical Inspectorate (CEI) / CEA Inspection

33.3. Contractor shall obtain other statutory approvals/ clearances, if and wherever required, from government departments but not limited to the following:

- a) State renewable energy development agency
- b) Pollution control board of the state
- c) Other applicable permissions/ clearances relevant for the offered site

33.4. The Contractor shall ensure facilitation of net-metering provision, as per the applicability defined in Clause 39 of Chapter-4, through necessary liaisoning and coordination with state regulatory authorities within the time schedule as described in Clause 8 of this Chapter.

33.5. The contractor shall at his own expense provide all amenities to his workmen as per applicable laws and rules.

33.6. The contractor shall ensure that all safety measures are taken at the site to avoid accidents to his or his Co-contractor's or Sub-contractor's or DLCSUPVA's Workmen.

33.7. Repair/ replace any equipment/ part/ components/ systems in time in the event of failure/ breakdown which is not on account of natural calamity or of the force majeure events etc.

34. PROGRESS REPORT & PROJECT REVIEW MEETING

34.1. The contractor shall submit fortnightly and monthly progress report (soft and hard copies) along with catch up plans against slippages to EIC/ DLCSUPVA.

34.2. DLCSUPVA shall hold project review meetings with Contractor at pre-defined periodicity defined at the onset of project, during project kick-off meeting.

35. OBLIGATIONS PRIOR TO TAKING OVER after installation

The contractor will check all the plant itself and attend the defect himself. A certificate may be submitted by the contractor regarding defect free installation.

36. HANDING OVER THE PLANT AFTER EXPIRY OF TERM

- 36.1. After the expiry of term & extension of term as the case may be, contractor shall hand over the plant to the DLCSUPVA in excellent condition. The contractor shall demonstrate performance test of all the major & critical equipment to ensure Generation from the Solar Photovoltaic Power Plant. While handing over the plant, contractor shall hand over all technical documents, literature, instruction manuals, lists of spare part & tools & tackles, and mandatory spares should be duly tagged and stored. Operator shall also hand over all the relevant record/documents.
- 36.2. On completion of installation, the contractor will apply to the EIC for the issue of Handing Over Certificate and the same will be issued within 1 months of the Handing Over in all respects, after verifying from the documents & tests and satisfying that the work has been completed in accordance with details set out in the control documents & Prudent Utility Practices.
- 36.3. All the aforesaid safeguards/ rights provided for DLCSUPVA shall not prejudice its other rights/ remedies elsewhere provided herein and/ or under law.

37. DEFECTS/ NON-ACHIEVEMENT PLANT DEPENDABLE CAPACITY AFTER HANDING OVER

- 37.1. In order for the contractor to obtain a Handing Over certificate, he shall rectify any defect/non-achievement of plant dependable capacity in accordance to the norms of manufacturer arising or that may have been noticed or developed during/after the plant has been taken over, the period allowed for carrying out such works will be normally one month. If any defect could not be remedied or plant dependable achievement capacity in accordance to the norms of manufacturer could not be achieved within a reasonable time, the DLCSUPVA may proceed to do the work at contractor's risk & expense and deduct from the performance security such amount as may be decided by the DLCSUPVA.
- 37.2. All the aforesaid safeguards/rights provided for the DLCSUPVA shall not prejudice its other rights/ remedies elsewhere provided herein and/ or under law.

38. Delay Penalty

38.1. Delay Penalty for delay in project commissioning

Time is essence of contract and it is contractor's responsibility to complete all the work and avail all the approvals on time.

In case contractor is unable to commission the project on time, the price discount would be at the rates mentioned below:

- a) If delay is upto 4 weeks : 0.5% of entire contract value per week of delay.
- b) If delay is more than 4 weeks and upto 8 weeks : 2% of entire contract value + 0.75% of entire contract value per week of additional delay beyond 4 weeks.
- c) If delay is more than 8 weeks : 5% of entire contract value + 1% of entire contract value per week of additional delay beyond 8 weeks subject to maximum of 10% of the total contract value.
- d) If the project commissioning is delayed due to any reason other than force majeure delay

discount as per above paragraph will be deducted from pending bills, if any, else through SD submitted by the Contractor.

39. APPLICABILITY OF NET-METERING FACILITY WITHIN THE SCOPE OF WORK OF THIS TENDER

Applicability of Net-Metering facility within the Scope of Work of this Tender

Net-Metering facility shall be applicable within the Scope of Work. If applicable, contractor shall ensure successful applicability of Net-Metering Facility as per the State Authority/Technical requirements laid down and as detailed in Job Specifications. Even in case, net-metering is not included in Scope of Work of this Tender, all necessary provisions shall be ensured in the Solar PV System supplied to make net- metering facility possible in the existing system.

40. Time Extension

No time extension will be provided to contractor in normal conditions. However, time extension will be given to contractor in exceptional case on the basis of justified ground. Technical Advisor to Vice Chancellor will be competent authority to give the time extension.

41. Arbitration

The arbitration clause of PWD B&R Code shall be applicable in TOTO.

CHAPTER 5
JOB SPECIFICATIONS (SCOPE OF WORK AND TECHNICAL
SPECIFICATIONS)

EXISTING SYSTEM:**POWER SUPPLY DISTRIBUTION SYSTEM:**

The SLD of the location shall be given in hard copy after award of work to the successful bidder. All the feeders are fed through a 415V LT bus which is being fed by Grid / Diesel Generators (in case of Grid outage).

PLANT OPERATING LOAD

Given in Annexure-15.

1. SCOPE OF WORK:**1.1. PART A – SOLAR PV PLANT**

Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana). The system shall be synchronized with Grid/DG (during grid outage) and shall also have net metering provision, as per the applicability defined in bid documents. The scope of work shall cover all civil, electrical & mechanical, plumbing works, providing of labour, tools, plants, materials and performance of work necessary for the planning, design, engineering, manufacture, quality assurance, shop assembly/ testing, insurance, supply, packing & forwarding, transportation, unloading at site, site storage & preservation, installation, commissioning, performance testing, acceptance testing, training of the DLCSUPVA's personnel for operation & maintenance of the SPV plant, supply of all spare parts, consumables, repairs / replacement of any defective equipment etc., handing over plant to the DLCSUPVA and guarantee of all equipment covered under the scope as per the technical specifications. Designing of all the equipment and systems along with test reports/OEM certifications, duly self-certified by contractor shall be submitted to EIC for final approval. The work shall be executed in conformity with the relevant applicable latest standards, codes, rules/ordinances & regulations. The overall design & engineering of the plant shall be based on latest available technology and optimal usage of space to minimize losses and maximize efficiency.

The Contractor shall make all required liasoning with all the agencies including all concerned power utilities for finalization/signing of Net Metering Agreement, as per the applicability defined in bid document, and other required approvals/permits/agreements so as to commence utilization of the power generated from solar power plant soon after its completion.

The detailed scope of work shall include but not limited to following:-

1.1.1. PART A1 - SUPPLY

The equipment and materials for Solar PV Power Plant with associated system (typical) shall include but not be limited to the supply of the following:

- a) Solar PV modules including mounting frames, fixed tilt structures, foundation bolts and nuts for holding structures.
- b) The DC power produced by Solar PV Modules shall be fed to the solar string inverters for inverting DC into AC power. Inverter shall use its MPPT (Maximum Power Point Tracking) control to extract maximum energy from solar array and produce true sine wave 415V AC, 3-

ph, 50Hz. For sizing of inverter, the contractor shall select String Inverters with appropriate capacity each with DC:AC power capacity ratio as 1:1. The array output shall be well within the input voltage range of the inverter so that the inverter works in MPPT range for most of the solar insolation range. This should be applicable for the whole life of the solar array and needs to be substantiated through design calculations duly approved by DLCSUPVA. Correspondingly, Inverters shall be capable to handle maximum open circuit DC voltage.

- c) AC Combiner Box/Switchgear/ACDB.
- d) Digital Voltage Meter and Ammeter, kWh meters, Metering instrument and protection relays, Net meters required for net metering scheme, as per the applicability defined in bid documents.
- e) Instrumentation and metering complying with the requirement of State Nodal Agency and specifications for operation and control of the plant. Appropriate instruments will be installed at suitable locations to measure the following details:
 - Solar radiation/ Insolation Data
 - Generation of Solar DC power measured at Inverter input as well as AC power fed from Solar PV System to the captive load bus
 - Exported power/energy
 - Frequency
 - Power Factor
- f) DC Cables, LT Power Cables, Control Cables including end gland terminations and other required accessories for both AC & DC power cables.
- g) Cable trays.
- h) Lighting arrestors/ protection for the plant, tool kit and earthing kit.
- i) Protection equipments, isolators, circuit breakers etc., if required.
- j) PVC pipes, hume pipes and accessories/trenches, if required.
- k) Earthing system for electrical equipments, Inverters, Module Mounting Structure, Lightning arrestor, etc.
- l) Fire extinguishers etc. as per requirement.
- m) Danger plates, name boards etc.
- n) Metering Instruments
- o) Complete system for transmission of plant data to grid substation, if required in case of net metering, as per the applicability.
- p) Any other equipment/material required to complete the Solar Power Plant.
- q) Special tools & tackles and test/measuring equipments.
- r) Plumbing material as per work order for cleaning of SPV.

1.1.2. PART A2 – SERVICES

A. MOBILIZATION AT SITE

Temporary/Permanent Storage facility for incoming material, arrangement of Power and

Water requirement during project construction.

B. CIVIL WORKS:

- i) Strengthening of existing roof, if required, waterproofing of roof, shadow analysis, etc., as required if any.
- ii) All requisite foundations and structures wherever required (PV array foundation, outdoor/indoor electrical equipments, etc.).
- iii) Requisite conduiting/cable trenches for routing cables as required for the
 - a) PV array field
 - b) Inverters
 - c) Outdoor/Indoor Power Electrical equipments
 - d) Connection to captive load bus
- iv) All external units/equipments such as String Inverters, Distribution Boards if any, etc. shall be provided with suitable canopy structure for protection from rain and sun.
- v) Arrangement of all requisite piping, valves & hoses for module washing water purpose and other services.
- vi) Ensure accessibility and free movement inside the solar plant, as required.
- vii) Providing proper drainage system for the plant by connecting to the main plant drain system.

C. ENGINEERING DRAWINGS AND DATA:

The scope of the contractor includes complete design and engineering, technical coordination, finalization of drawings/documents, submission of approved engineering drawing/documents and processing for their approvals by DLCSUPVA. The complete design of the Solar Power Plant (such as PV Array configuration, selection of components and their ratings, etc.) shall be duly certified by IIT/NIT or any Govt. reputed institution of this field as approved by client. IIT/NIT or any Govt. reputed institution of this field should also submit a signed declaration of having gone through the complete technical specifications of our tender pertaining to the equipment/system being certified by him/her. Following documents shall be submitted to DLCSUPVA for review and reference:

- i) Detail Technical Specifications and Guaranteed Technical Particulars duly certified by IIT/NIT or any Govt. reputed institution of this field
- ii) Organization chart
- iii) General arrangement drawing for the project and layout plan (duly certified by IIT/NIT or any Govt. reputed institution of this field) including
 - a) Plant Layout
 - b) Single Line Diagram of the power plant
 - c) SPV Array Layout drawing
 - d) Foundation drawing, if required
 - e) Switch gear – scheme of protection at captive load bus
- iv) Quality Assurance Plans
- v) PERT/BAR diagram with critical path showing detailed time schedule of supply, erection and commissioning of the complete plant, and periodic review schedules (fortnightly or monthly). The entire work schedule should be subdivided into micro activity schedule interval with details

of review plan.

Further, the scope shall also include submission, in proper shape & format, of all types of manuals, handbooks & documents in requisite numbers to the DLCSUPVA at different phases of the project as per the requirement of DLCSUPVA.

Contractor shall share the un-priced Purchase Order/Work Order copy with DLCSUPVA in line with the project execution as and when desired after placement of orders.

D. ALL STATUTORY CLEARANCES AND OTHER APPROVALS:

- i) All statutory clearances related to electrical works required from the concerned state power utilities/ State Electricity Board/ Central Electricity Authority and any from Pollution Control Board/ State Nodal Agency/ Forest Department (if required) or any other statutory body shall be obtained by the Contractor, if required. DLCSUPVA would fill up the required forms and applications as advised by the contractor.
- ii) Arranging Chief Electrical Inspector General (CEIG)/ CEA Inspection clearance/permission to connect, if required, shall be in contractor's scope. The Contractor shall be responsible for interconnection of Solar PV power plant with the State grid connection and net metering agreement, as per the applicability.
- iii) Capacity Registration with State Regulatory Agency, if required.
- iv) For all the above clearances, the fees/statutory charges shall be reimbursed by the DLCSUPVA on production of receipt.
- v) Tentative list of approvals and clearances that may be required are as below:
 - a) Connectivity approval for net-metering, as per the applicability defined in Clause 39 of Chapter-4
 - b) Project registration, if applicable
 - c) Metering Approval, if applicable
 - d) Meter testing, CT, PT testing and inspection certificate
 - e) Clearance from Chief Electrical Inspector, if required
 - f) Certificate of commissioning – Committee constituted by university for said purpose.

E. ELECTRICAL AND ELECTRONICS WORK:

- i) Cable laying
 - a) Underground laying of cables as per Standards, providing cable markers, including backfilling, as per the design approved.
 - b) Making straight through joints using heat shrinkable sleeves for cables or as per applicable norms.
 - c) Connection, termination and testing of cables to distribution boards.
 - d) Proper sand bedding must be provided.
 - e) Wherever there is drainage or water flowing channels, the trenches should be water proof (i.e. brick lined/RCC) and filled with sand to prevent any water accumulation or cables should be laid in sealed GI/ hume pipes or wherever cable is passing through drain, rerouting of cables should be done.
- ii) Earthing System
Installation, testing and commissioning of earthing electrodes/earthing strips as per the requirements mentioned in Technical Specifications.

F. Plumbing Work:-

The complete plumbing work for cleaning provision of SPV will be in scope of contractor. The contractor will provide necessary connection from existing water tank, fixing of Motor Pump, Electric Connection, Pipe laying etc. complete in all respect upto entire satisfaction of EIC.

G. TRANSPORTATION OF EQUIPMENT FROM WORKS TO SITE, STORAGE, AND ACCOMMODATION AT SITE

- i) All necessary permits and licenses, as may be necessary, to transport the equipment/ material, machinery, and labour along or across highway, roadway, railway, bridge, dike, dam, river or through posts of toll collection, Octroi checks or other line border or barrier shall be obtained by Contractor.
- ii) Receipt, unloading & installation of all supplied equipment on foundations at their respective places.
- iii) Proper storage of material before installation. Storage area shall be suitable to prevent equipment against rain & water logging.

H. QA/QC

Submission of QA/QC procedure for all activities in line with the detailed work specification, relevant codes/standards of practice for approval of EIC before start of any work at site. The works shall be executed in line with the approved QA/QC procedures.

I. TESTING/INSPECTION

All acceptance and routine tests, if required as per the specification, relevant standards and approved QAPs (Quality Assurance Plans) shall be carried out at the cost of the contractor. All the material will be inspected by expert committee constituted by university for said purpose. Expert committee will inspect the material at factory premises or at site as per his opinion or convenience.

J. PAINTING

Painting of all equipments and structures, if required, shall be done as per DLCSUPVA's standard color coding scheme. The quality and finish of paints shall be as per standards of BIS or equivalent.

K. TRAINING OF DLCSUPVA'S PERSONNEL

Providing a detailed training plan on energy assessment, design, technologies, plant design, and erection & commissioning, operation & maintenance procedures, which shall, after approval by DLCSUPVA, form the basis of the training program. Contractor shall impart classroom as well as field training on site to DLCSUPVA personnel during works, erection, testing & commissioning of the plant and associated equipments.

Expenses towards travel, stay, lodging & boarding and other expenses for the DLCSUPVA's personnel shall be borne by the DLCSUPVA.

L. SYNCHRONIZATION, COMMISSIONING AND OPERATION

- i) The Solar Power Project would be synchronized by the contractor to the local/captive Grid System after taking proper approvals for net-metering facility, as per the applicability defined in

Clause 39 of Chapter-4. It shall meet all the connection conditions prescribed by State Electricity Regulatory Agency/Grid Sub-station and otherwise meet all other Indian legal requirements for synchronization to the Grid System.

- ii) DLCSUPVA shall reserve the right to conduct Technical Audit of solar PV Power Plant after completion of commissioning.

M. PERFORMANCE GUARANTEE (PG) TEST

The performance guarantee tests shall be carried out as specified in SCC. All special equipment, tools and tackles, instruments, measuring devices required for the successful conductance of PG test shall be provided by the bidder, at his own cost. All costs associated with the PG tests shall be included in bid price.

N. CODES AND STANDARDS

- i) The equipments and accessories covered shall be designed, manufactured and tested in accordance with the latest relevant standards and codes of practice published by the Bureau of Indian Standards (BIS), IEC, IS etc. as applicable. The quality of materials of construction and the workmanship of the finished products/components shall be in accordance with the highest standard and practices adopted for the equipment covered by the specification.
- ii) All equipment shall be designed for operation in tropical humid climate at the required capacity in a minimum de-rating temperature of 50°C. Equipment shall be suitable for operation in an ambient temperature range of 0 to +50°C. Maximum relative humidity of 90% shall also be taken into consideration for design of equipment.

2. TECHNICAL SPECIFICATIONS

2.1 SYSTEM DESCRIPTION:

2.1.1 Solar Photovoltaic (SPV) system shall be of following configuration:

- On-Grid SPV System (Solar System + Grid/DG)

2.1.2 Solar Photovoltaic (SPV) system as defined in 2.1.1 shall consist of minimum following items:

- i) Solar PV Module- N-Type Topcon Bifacial
- ii) Module Mounting Structures
- iii) Inverters: On-Grid. MPPT Solar String Inverters. The inverters should have adequate provisions for input DC Energy measurement. The inverters shall have feature for remote communication over cloud network.
- iv) AC LT Breaker Feeder/ AC Switchgear / ACDB
- v) Earthing Kit
- vi) Lightning Arrester
- vii) Solar-Grid/DG Energy Management system.
- viii) Flexible & armoured Cables (AC and DC), Cable Trays and other Hardware accessories

- ix) Communicable Multi-Function Energy Meters (1S Class) and Ampere Hour Meters (as per the applicability)
 - x) Net meter as per the specifications prescribed by state electricity regulatory authorities.
 - xi) Plumbing, Mechanical and electrical work for facility of cleaning of SPV.
- 2.1.3 All items in appropriate quantity shall be ensured to complete the project while ensuring quality as stipulated in the industry standards.
- 2.1.4 The 3Ø-output of the system shall be fed to the AC switchgear breaker feeder (included in the scope of this tender) which shall be synchronized further with the existing AC switchgear bus to cater loads already connected i.e. solar power shall be synchronized with the captive load/grid supply. There shall be provision of exporting any additional power generated to the grid based on the availability of net/gross metering facility in the state and as per the applicability defined in bid documents. The Inverter provided shall have net metering facility with power export control feature. In case, the net-metering facility is presently not available, facility must be available in the Inverter such that the excess AC power generated through Solar PV System should not get exported to the Grid automatically through suitable electronic controls by reducing the power generation technique and not by interrupting the Inverter operation.
- 2.1.5 It shall be ensured that solar power generation and utilization is maximized. The balance power requirement shall be met from other sources i.e. Grid or Diesel Generator (DG).
There should be no break in the supply while changing from one mode to another mode of operation, in case of hybrid system.
- 2.1.6 It shall be ensured that Diesel Generators are never run below their minimum operating load condition. It must be ensured that Inverter synchronizes with DG set automatically and even if the load has reduced on the load bus, no harm is done to DG set and whole system continues to work.
- 2.1.7 Solar-Grid/DG Energy Management system should be provided when DG sets are available at the location and Solar system shall be synchronized with DG. The system shall have following features –
- i) Linear control of solar output (0-100%)
 - ii) Suitable logic control to ensure that DGs are not operated below minimum loading requirement
 - iii) Suitable for monitoring solar hybrid system vs. grid power injection at captive load bus
 - iv) Suitable for preventing flow of power to grid on all the days, and should allow the power flow to grid if net-metering is available or is made available in future.
 - v) Suitable for monitoring controller regulation
 - vi) Suitable for operating with different/multiple inverters make
- 2.1.8 The key features of a hybrid system having storage batteries are given below:
- i) During day time, when sufficient sun light is available, the connected load should be powered from solar electricity generated.
 - ii) If the load consumption is lesser than the SPV plant production, then the extra power should be exported to the utility grid through the bidirectional meter which records the net energy

exported to the grid. In the absence of net-metering, the Inverter shall automatically reduce the power generation and shall maintain supply of PV power to captive load bus.

- iii) Even if the grid fails during day time when PV power is available, the Anti-Islanding shall act and disconnect the Grid instantaneously as per the requirements of IEC.
- iv) 'Low battery' alarm contact to be made available before starting the DG. If 'low battery' alarm is activated, a dry contact for starting DG shall be made available. The battery voltage shall be monitored and in case of battery voltage falling below pre- set value, a potential free contact shall be made available to start the DG. Once the DG reference voltage is available to Inverter's AC input, the Inverter should automatically synchronize with that DG and supply the load bus demand automatically, with maximization of solar PV power utilization according to minimum operating load requirement of DG.
- v) During day time when sufficient solar electricity is not available to power the load, the balance energy should be drawn from the grid/DG set.
- vi) In general, the priority of usage of input energy sources should be in the following order:
 - a. First Priority – Solar
 - b. Second Priority – Solar + Grid
 - c. Third Priority – Solar + Diesel Generator

There should be no break in the supply (transfer time between supplies to be less than 10 milliseconds) while changing from one mode to another mode of operation, in case of hybrid system.

- 2.1.9 Communicable multi-function energy meter (Class 1S) and ampere hour meter with RS-485 communicable port shall be provided for solar power system at its breaker panel.
- 2.1.10 All breakers available for Solar, Grid and DGs shall have NONC control contacts through which suitable wiring/cabling can be done from respective breakers to the Controller/ Solar-Grid/DG Energy Management system.
- 2.1.11 The overall PV system should comply with the minimum technical requirements/standards for SPV systems specified in MNRE/SECI release.

2.2 GENERAL REQUIREMENTS:

- 2.2.1 Total capacity of rooftop Solar PV power plant to be installed shall be 400 KWp on area of available on roof top of building of various departments. The final location will be decided during the installation stage as per the site conditions and the General Arrangement Drawings & Site Layout Plan submitted during the design stage. Considering the possibility of distributed installation based on the availability of space, independent Inverter(s), cabling, DB(s), and JB(s) might be required and the same must be considered while preparing offer. Necessary site visit shall be made to assess the required quantum of job involved and cabling required. The ratings of different components of a Solar Power Plant like PV Panels, Inverters can be suitably selected as per the site survey and requirements.
- 2.2.2 SPV modules shall be installed on rooftop of building of various department. The corresponding Inverter(s) and distribution boards etc. shall be housed suitably.

- 2.2.3 Array structure of PV yard and all electrical equipments such as inverters, batteries (if available) etc. shall be grounded properly.

Four separate earthing system shall be provided, each for DC Circuits, AC Circuits, Electronic Circuits and Lightning Protection System (LPS). If the inverters to be installed require separate earthing as per OEM recommendations, the same needs to be provided.

Towards this end, adequate number and appropriate size IS:3043 compliant earthing pits suitably calculated as per the design criterion or at least one each for AC circuit, DC circuit, Electronic circuit and lightning protection system, whichever is more shall be ensured. The complete earthing job including preparation of earthing pits and connection with the existing earth grid, if any, shall be ensured during the project execution.

- 2.2.4 Optimization of generation of electricity in terms of kWh generated per KWp of PV capacity installed vis-à-vis available solar radiation at the site shall be ensured (may be obtained through use of efficient electronics, lower cable losses, or maximization of power transfer from PV modules to electronics and the grid, etc.).
- 2.2.5 PV modules shall be connected in series - parallel manner to meet the voltage requirement in line with the datasheet of selected Inverter. String fuses, sub-array fuses, and array fuses shall be provided in individual strings, sub-arrays, and arrays respectively as per the design requirement specified in IEC 62548 and IEC 60269-6.
- 2.2.6 Proper sealing arrangements against rodents/water at the points of cables entering the enclosures/ buildings should be incorporated.

Latest engineering practice shall be followed ensuring long-term compatibility requirements and continuity of equipment supply and the safety of the operating staff.

2.3 SPECIFIC TECHNICAL REQUIREMENTS:

2.3.1 Solar Panels/PV Modules

- 2.3.1.1 The technical details of Solar PV Modules shall be as given below –

Sl. No.	Description	Details
1	Type of SPV Module	N-Type Topcon Bifacial
2	Peak Power rating of module	Shall not be less than 575 Wp at Standard Test Conditions
3	Module Efficiency	Shall not be less than 21% at Standard Test Conditions
4	Fill Factor	Minimum 75%

- 2.3.1.2 List of approved makes is given in Annexure-20.

2.3.1.3 Codes and Standards

Shall conform to all the relevant standards, but not limited to the following:

Codes	Description
IEC 61215 / IS14286	Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval
IEC 61730 – 1	Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction
IEC 61730 – 2	Photovoltaic (PV) module safety qualification – Part 2: Requirements for Testing
IEC 62804-1	Photovoltaic modules – test methods for the detection of potential induced degradation – Part 1 : Crystalline silicon

Compliance to the PID free nature of PV modules shall be established.

- 2.3.1.4 SPV module shall perform satisfactorily in relative humidity up to 90% with operating temperatures between -40°C & +85°C and shall withstand wind speed on the surface of the panel as per site specific requirement.
- 2.3.1.5 The PV modules shall be equipped with bypass diode to minimize power drop caused by shade.
- 2.3.1.6 The module frame shall be made of anodized Aluminium or corrosion resistant material frame, which shall be electrolytically compatible with the structural material used for mounting the modules with sufficient no. of grounding installation. The anodizing thickness shall be 15 micron or more.
- 2.3.1.7 The actual module power capacity shall not vary by more than +3% from its minimum certified module power capacity. No negative tolerance shall be accepted.
- 2.3.1.8 The temperature co-efficient for power output of the Solar PV module shall not be more than -0.041%/°C.
- 2.3.1.9 All photovoltaic modules shall have linear performance warranty from second year. The solar PV modules offered shall not degrade more than 1% in first year and not more than 0.4% p.a. from 2nd year to 25 years of its rated power.
- 2.3.1.10 The solar Module shall be warranted for 12 years for product and 25 years for Performance.
- 2.3.1.11 The module mismatch losses for modules connected to an inverter shall be less than 2%.
- 2.3.1.12 Module shall be PID free. The modules shall be provided with anti-reflection coating and back surface field (BSF) structure to increase conversion efficiency.
- 2.3.1.13 The SPV module shall be made up of impact resistant, low iron and high transmissivity toughened glass. The front surface shall give high encapsulation gain.
- 2.3.1.14 The SPV modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from environment. The encapsulation arrangement shall ensure complete moisture proofing for the entire life of solar modules.
- 2.3.1.15 The equipment shall be designed to give efficient and reliable performance and shall be such that the risks of accidental short-circuit due to animals, birds or vermin are obviated.
- 2.3.1.16 The data sheets of all modules shall be provided. The exact power of the module shall be indicated if the data sheet consists of a range of modules with varying output power.

- 2.3.1.17 Module Junction box and Terminal Block shall be of high quality (IP 68 rated) fitted at the back side and shall be weather proof and designed to be used with standard wiring or conduit connection. Each Junction Box shall contain Bypass Diode. They shall have a provision for opening /replacing the cables, if required. The module junction box shall be certified as per IEC 61215.
- 2.3.1.18 Each module shall have minimum two 4 sq.mm. stranded UV resistant output cables each terminated with connectors adaptive to MC4 type connector directly. MC4 type connector should have typical certification from testing agencies such as TUV, competent for the purpose.
- 2.3.1.19 The typical solar PV module electrical characteristics including current-voltage (I-V) performance curves and temperature coefficients of power, voltage and current shall be provided for all the modules supplied. However, the tabulated document with all the relevant data like voltage, current, power output for each module is also required to be provided along with the supply.
- 2.3.1.20 Modules deployed must use a Radio Frequency Identification (RFID) tag for traceability. It shall be well protected from rain and sun through suitable means and contain the following information:
- a) Name of the manufacturer of the PV module
 - b) Name of the manufacturer of Solar Cells
 - c) Month & year of the manufacture (separate for solar cells and modules)
 - d) Country of origin (separately for solar cells and module)
 - e) I-V curve for the module
 - f) Wattage, Imp, Vmp and FF for the module
 - g) Unique Serial No. and Model No. of the module
 - h) Number and Date of IEC PV module qualification certificate
 - i) Name of the test lab issuing IEC certificate
 - j) Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001
- 2.3.1.21 All individual modules shall be provided with Name Plate label at the back of module which shall provide the information given below for identification. They shall be clearly visible and shall not be hidden by equipment wiring. Type of labels and fixing of labels shall be such that they are not likely to peel off/ fall off during the life of the panel.
- a) Manufacturer's Name
 - b) Model Number, Serial Number
 - c) Overall Dimensions (WxLxD)
 - d) Weight (kg)
 - e) Maximum Power (Pmax), Voltage (Vmp), Current (Imp)
 - f) Short Circuit Current (Isc), Open Circuit Voltage (Voc)
 - g) Main System Voltage
 - h) Relevant standards, Certification lab. name
 - i) Warnings, if any

2.3.1.22 Testing of Solar PV Modules

PV modules must qualify test from IEC/NABL accredited laboratory as per relevant IEC standard and report/certification of the same must be attached. The performance of PV modules at STC conditions must be tested and approved by one of the IEC / NABL Accredited Testing Laboratories / Solar Energy Centre of MNRE/ any other MNRE authorized test laboratories/centres. The test certificates shall be submitted for acceptability of modules.

2.3.2 Module Mounting Structure:

2.3.2.1 The PV modules shall be mounted on metallic structures called Module Mounting Structures (MMS) having adequate strength and appropriate design, which can withstand the load of the modules and design wind pressure.

2.3.2.2 Module mounting structure with fixed tilt, south facing orientation and tilted at the location's latitude angle from the horizontal is proposed in order to maximize the total annual incident solar irradiation. However, a different orientation or design may be proposed to achieve better generation with detailed documentary proof.

2.3.2.3 The mounting structures shall withstand the maximum wind speed of the location. The Contractor shall establish the maximum wind speed of the location through relevant standards (IS 875 and other relevant standards).

2.3.2.4 A detailed design calculation report evaluating the strength of existing rooftop to sustain the dead weight of the system (Structure and Module) as well as the dynamic weight of the installed system shall also be submitted. The report should qualify the rooftop for installation of the Solar PV System with desired design parameters and having sufficient safety margin. In case the rooftop is not having enough strength to support the PV System installation, strengthening of the same shall also be carried out. Any additional statutory clearances as required for complying to regulatory agencies norms shall have to be ensured by the Contractor. The work shall commence only after submission of load bearing strength calculation duly certified by IIT/NIT/NABL Lab or any Govt. reputed institution decided by university and approved by EIC.

2.3.2.5 Codes and Standards

Shall conform to all the relevant standards, but not limited to the following:

Codes	Description
UL 2703	Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels
IS 2062	Hot rolled medium and high tensile structural steel — specification
IS 4759	Hot-dip zinc coatings on structural steel and other allied products
IS 2629	Recommended practice for hot-dip galvanizing of iron and steel
IS 3043/IEEE 80	Code of practice for earthing

2.3.2.6 The array structure shall be so designed that it would occupy minimum space without sacrificing the output from SPV panels. The structure shall be designed so that repair and maintenance activity could be done easily and shall be in line with the site requirements.

- 2.3.2.7 Adequate walking space shall be made available between the SPV arrays to allow walkway for maintenance personnel.
- 2.3.2.8 All solar panels must be accessible from the top for cleaning and from the bottom for access to the module junction box.
- 2.3.2.9 The module mounting structure members would be made of hot dip galvanized MS profiles in case of flat roof-top systems and penetrating anodized Aluminium structures/ballasted non-penetrating rails in case of slant rooftop systems. The minimum thickness of galvanization/anodization shall be at least 80 microns or higher as per IS 4759.
- 2.3.2.10 In case of flat-rooftop systems, choice of selection between GI compact structure and anodized Aluminium structures/ballasted non-penetrating rails shall depend on the load bearing capability of the existing roof, without requiring modification of existing rooftop. If the load bearing capability of existing roof is adequate, established through relevant design calculations, GI compact structure shall be preferred.
- 2.3.2.11 In general, bolts, nuts, shims and other hardware shall be SS 304. The generally applicable engineering principle will be that fasteners equal to or greater corrosion resistance than the most corrosion resistant metals being fastened. Standoff materials shall be used to reduce electrochemical corrosion between galvanically dissimilar metal surfaces such as nylon washers, rubber insulators.
- In case of rooftop systems using aluminium structure, mounting structure components including T slotted rails, End and mid clamps, angle brackets, and T nuts & bolts should all be made out of anodized Aluminium. The rails riveted to metal rooftop structures shall be done with pop rivets.
- 2.3.2.12 In case of metal roofs with available standing seam, modules shall be preferred to be mounted directly to clamps without requiring roof penetration for riveting. The clamps to be used shall be made out of anodized Aluminium.
- 2.3.2.13 In case of tiled roofs, panels shall be mounted directly to rails fastened to hooks fixed to underlying rafters. The rails and clamps shall be made of anodized Aluminium.
- 2.3.2.14 The weight of the complete solar PV system installed on rooftop shall not exceed 30 kg per sq. mt.
- 2.3.2.15 The minimum thickness of channels, angles will be 2mm and for base plate 8mm.
- 2.3.2.16 The minimum clearance of the lowest part of the module structure and the developed/ finished ground level shall not be less than 500 mm in case of ground mounted, 300 mm or minimum height of parapet roof wall, if available, whichever is more, in case of flat roof mounted and 100 mm in case of slant roof mounted.
- 2.3.2.17 The foundation for module mounting structure shall be adopted as per the design basis report certified by IIT/NIT or any Govt. reputed institution of same field approved by EIC. In general, depth of foundation shall be uniform for all the foundation structures and depth shall be finalized considering worst soil conditions where maximum foundation depth is required.
- 2.3.2.18 Foundation bolts, if applicable, shall be used as detailed in the design basis report duly certified by IIT/NIT or any Govt. reputed institution of same field.
- 2.3.2.19 The structure shall support Solar PV modules in portrait orientation, absorb and transfer the

mechanical loads to the ground/roof properly. Welding or complex fixing mechanism shall not be allowed for installation of module mounting structure to the foundation.

2.3.2.20 All mechanical items must be supplied as per approved drawing, BOQ and as per direction of EIC.

2.3.3 On-Grid MPPT Solar String Inverters:

2.3.3.1 The DC power produced by Solar PV Modules shall be fed to the solar string inverters for inverting DC into AC power. Inverter shall use its MPPT (Maximum Power Point Tracking) control to extract maximum energy from solar array and produce true sine wave 415V AC, 3-ph, 50Hz. For sizing of inverter, the contractor shall select String Inverters of appropriate capacity each with DC:AC power capacity ratio as 1:1. The array output shall be well within the input voltage range of the inverter so that the inverter works in MPPT range for most of the solar insolation range. This should be applicable for the whole life of the solar array and needs to be substantiated through design calculations duly approved by DLCSUPVA. Correspondingly, Inverters shall be capable to handle maximum open circuit DC voltage.

2.3.3.2 List of approved makes is given in Annexure-20.

2.3.3.3 The Solar Inverters shall be selected after conformance by IIT/NIT or any Govt. reputed institution of same field for adherence to specifications laid out in the Tender Document. A duly certified conformance certificate from IIT/NIT or any Govt. reputed institution of same field needs to be submitted before placement of purchase order.

2.3.3.4 Codes and Standards

Shall comply to all the relevant standards, but not limited to the following:

Codes	Description
IEC 61727	Photovoltaic (PV) systems - Characteristics of the utility interface
IEC 61683	Photovoltaic systems –Power Conditioners – Procedure for measuring efficiency
IEC 62116-2014	Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures
IEC 62109-1 & 2	Safety of power converters for use in photovoltaic power systems
UL 1741	Standard for Inverters, converters, controllers and interconnection system equipment for use with distributed energy resources
IEEE 929-2000	Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
IEC 62894	Photovoltaic Inverters - Data Sheet and Name Plate
IEC 62910	Utility-interconnected photovoltaic inverters - Test procedure for low-voltage ride through measurements
IEC 62891	Indoor testing, characterization and evaluation of the overall efficiency of photovoltaic grid connected inverters
IEC 61000	Electromagnetic Compatibility
IEC 60068	Environmental Testing
IS 3043/IEEE 80	Code of practice for earthing

For tests like Anti Islanding (IEC 62116) and efficiency measurement (IEC 61683), tests from NABL accredited labs shall be acceptable.

2.3.3.5 The inverter output shall always confirm to the captive load bus (fed through Grid/DG) in terms of voltage and frequency.

2.3.3.6 Technical details required for Inverters to be installed shall be as under

Parameters	Values
Output frequency	50 Hz \pm 0.5% Hz
Maximum Input voltage	1000 V DC
Capacity	Rated capacities of the inverters shall not be less than the solar PV array capacity
Inverter Output Voltage	415 V \pm 1%, three phase, 4-wire output. Nominal voltage could be adjusted \pm 5% via system set points. Inverter should work in extremes of the limits in each phase without getting interrupted.
THD (Current)	Less than 3%
Power factor control range	\geq 0.9 lead or lag
No load losses	<1% of rated power and maximum loss in sleep mode shall be less than 0.05%
Ambient temperature	00C to +550C
Humidity	95% non-condensing
Enclosure(type)	IP 32 or better (Indoor rated) IP 65-68 (Outdoor rated)
Overload Capacity	125% for 10 min 120% at 250C continuous on DC side
DC Injection	Less than 0.5% of nominal load current
Electromagnetic Compatibility	As per IEC 61000
Noise level	Less than 85 dB at 1 mt.

2.3.3.7 The efficiency of the Inverter shall be at least 97% at 75% load. The conversion efficiency for Inverter at different loads – 10%, 25%, 50%, 75%, 100%, 120% shall be specified in the offer. Above efficiencies are when measured without output inverter transformer. The hybrid inverter shall have an efficiency of at least 92% at 75% load.

2.3.3.8 Inverter shall have Low Voltage Ride-Through (LVRT) feature to provide support during grid fault/ disturbance. Inverter should be also synchronized with the DG set installed when the DGs are available and continue to work at different loads of the site without being switched off / damaged.

2.3.3.9 Inverter shall have the facility of recording solar energy (KWh) generated at the output of Inverter in addition to PV voltage, PV current (in Amps), Instantaneous PV power, daily PV power generated & cumulative PV power generated. Inverter shall also have the capability to remotely communicate these data to remote system through cloud network.

2.3.3.10 Maximum Power Point Tracker (MPPT) shall be integrated in the Inverter to maximize energy drawn from the Solar PV array. The MPPT shall be microprocessor based to minimize

power losses. The operating voltage range of Inverter and the MPPT shall be large enough so that it satisfactorily operates for PV modules exposed to the ambient temperature range of -100C to 600C.

2.3.3.11 DC lines shall have suitably rated isolators to allow safe start up and shut down of the system.

2.3.3.12 The Inverter must have the feature to work in tandem with other similar Inverters and to be successively switched "ON" and "OFF" automatically based on solar radiation variations during the day.

2.3.3.13 The Inverter shall have anti-islanding protection as per the relevant IEC standards.

2.3.3.14 Minimum operating temperature range: -100C to (+)600C.

2.3.3.15 Remote as well as local monitoring shall be provided. Built-in data logger (to record all the important operational parameters and all the events) to monitor plant performance through external PC shall be provided. The communication shall be in such a way that the Inverter can be monitored with the help of appropriate software from the centralized system. The Inverter shall have the facility to provide the analysis for reason of tripping, in cases of inadvertent tripping.

2.3.3.16 MOV type surge arrestors shall be provided on all PV inputs for overvoltage protection against lightening induced surges.

2.3.3.17 Inverter shall have feature to be regulated from 0-99% in steps of minimum 1%.

2.3.3.18 Inverter shall include ground lugs for equipment and PV array groundings. The DC circuit ground shall be a solid single point ground connection.

2.3.3.19 Inverter shall have power export control. Inverter shall have the facility to export excess PV power to grid in case consumption of load is less than the generation and net/gross metering is available. The provision should be there to enable and disable this export feature.

2.3.3.20 Inverter shall be tropicalized and design shall be compatible with conditions prevailing at site. Provision for adequate cooling of Inverters shall be available inside the Inverters.

2.3.3.21 Nuts, bolts and the Inverter enclosure shall have to be adequately protected taking into consideration the atmosphere and weather prevailing in the area.

2.3.3.22 Display:

Inverter shall have the facility to display the basic parameters of the system on in-built LED/LCD display on its front panel or on separate data logging/display device to display following or through any other indication means:

- a) DC Input Voltage
- b) DC Input current
- c) AC Output Voltage
- d) AC Output Current
- e) AC Power output (kW)

- f) AC Energy output (KWh)
- g) Frequency
- h) Temperatures (0C)
- i) Inverter ON/OFF
- j) Grid ON/OFF
- k) Inverter over-load
- l) Inverter over-temperature

2.3.3.23 Protections:

Following is an indicative list of protections (the actual scheme shall be finalized at design stage):

- a) Over-voltage both at input and output
- b) Over-current both at input and output
- c) Over/under grid/bus frequency
- d) Over temperature
- e) Reverse polarity protection
- f) Array ground fault protection
- g) Protection against earth leakage faults (DC as well as AC side)
- h) Protection against lightning induced surges
- i) Protection against surge voltage induced at input and output due to external source
- j) Provision for input & output isolation
- k) Inverter shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.

2.3.3.24 In addition, Inverter shall ensure following protection measures:

- a) MCBs/MCCBs shall be provided for systems connected to Inverter (i.e. Solar PV system, Battery System (as per the applicability defined in Clause 39 of Chapter-4), Captive Load System or Mains System).
- b) The Inverter shall include appropriate self protective and self diagnostic feature to protect itself and the PV array from damage in the event of Inverter component failure or from parameters beyond the Inverters safe operating range due to internal or external causes. The self-protective features shall not allow signals from the Inverter diagnostic circuit 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 failure, shall be cleared by the Inverter protective devices.
- c) Automatic reset of all non-critical faults such as overloads, AC over voltage/under voltage, etc. once the fault has been cleared.

2.3.3.25 Operating modes of Inverter:

- a) **LOW VOLTAGE MODE:** The control system shall continuously monitor the output of the solar PV plant. Once the pre-set value is exceeded, Inverter shall automatically “wake up”

- and begin to export power provided there is sufficient solar energy and the Inverter voltage and frequency are in the specified range.
- b) ACTIVE Maximum Power Point Tracking (MPPT) MODE (HIGH POWER MODE): When solar radiation increases further, the Inverter shall enter Maximum Power Point Tracking (MPPT) mode and adjust the voltage of the SPV array to maximize solar energy fed into the grid. When the solar radiation falls below threshold level, the Inverter shall enter in low power mode.
 - c) SLEEP MODE: Automatic 'sleep' mode shall be provided so that unnecessary losses are minimized at night.
- 2.3.3.26 DC side of each inverter shall be earthed to distinct earth pit through adequate size conductor as per IS 3043. The size of conductor shall be as per the maximum fault current on DC side.
- 2.3.3.27 The Inverter shall withstand the environmental tests as per IEC 60068 or equivalent Indian Standard, with the Inverter working at full load for at least last half an hour. Environmental test results in respect of any similar design Inverter for at least 20 KWp SPV systems will be adequate.
- 2.3.3.28 Communication of inverter should have facility to connect via Wi-Fi/GPRS and Modbus RS-485.
- 2.3.3.29 In case of off-grid or hybrid system with battery storage solution (as per the configuration outlined in Clause 2.1.1 of Chapter-5), following minimum features shall be guaranteed in the Inverter:
- a) The MPPT based solar charge controller shall comply with IEC 62093, IEC 62509 and IEC 60068-2.
 - b) Accuracy class 0.5 Ah meter to measure the cumulative charging and discharging status of battery bank.
 - c) The MPPT based solar charge controller shall guarantee following minimum features (if provided battery):
 - i) Battery current limiting feature to avoid over charge into the batteries
 - ii) Optimization of battery life and backup power supply - Design basis document.
 - iii) Battery and PV reverse polarity protection (no use of blocking diodes which reduces overall efficiency of the system).
 - iv) Rated MCCB/ MCB on all PV inputs & battery inputs.
 - v) Facility to communicate with External Monitoring System for all important parameters.
 - vi) Efficiency of Charge Controller $\geq 90\%$
 - vii) Warranty: 10 years (standard)
 - viii) Environmental Testing: IEC 60068 (1, 2, 14, 30)/Equivalent BIS Std. Conformance test certificate to be submitted by successful bidder.
 - d) A bidirectional inverter unit shall be used such that the same circuit elements are used for performing inverting and battery charging (through mains) operation, if required. It should be an IGBT based; microprocessor controlled inverter & should incorporate PWM technology and all the desired safety features for reliable running of Inverter.

Following minimum features should be ensured in such bidirectional inverter unit:

- i) Operation without any derating from 0-50 degrees of ambient temperature
 - ii) Minimum overload capability of 110% for 60 sec, and 125% for 30 sec. iii) Inverter should be able to sustain load imbalance between the phases. It is important as different phases may have different loads and hence it shall be checked/defined to ensure that Inverter is working even if say, R phase has 10% load while Y-phase has 5% load and B-phase has 100% of its rated load.
 - iv) Automatic reset of all non-critical faults such as overloads, AC over voltage/ under voltage etc. once the fault has been cleared.
 - v) Facility to export excess PV power to grid in case consumption of load is less than the generation. Provision should be there to enable & disable this export feature. However load should remain and be supplied from the solar power and only balance power exported.
- e) The mains based battery charger should incorporate following minimum features:
- i) Facility to bypass grid to loads and charge batteries at the same time.
 - ii) Should be IGBT based for rugged operation.
 - iii) Should use AC supply of all the three phases and not single phase.
 - iv) Should have a peak efficiency of at least 85% for AC to DC conversion.
 - v) 3 stage (float, boost and equalize) battery charging for long life of the battery.
 - vi) Facility to enable/disable charging of battery through mains by controlling the import power from mains.
 - vii) Facility to communicate with External Monitoring System for all critical parameters such as Inverter voltage/current/frequency, Mains voltage/current/frequency and current, as well as all active faults.

2.3.4 AC LT Breaker Feeder/ AC Switchgears

2.3.5.1 The scope shall include standard load distribution boards/panels complete with cubicles, protection, metering, bus-bar system, cabling, wiring and other accessories, the quantities/ratings of which shall be finalized during detail engineering, duly certified by IIT/NIT or any govt. reputed institution approved by client and approved by EIC.

2.3.5.2 All the above boards/panels shall be metal enclosed, 415V switchgear type, complete with suitably rated:

- a) Surge Protection Devices
- b) Required no. of MCCBs and ELCBs
- c) Numerical Relays, with the provision of in-built event logger
- d) Required no. of Multifunction meters
- e) Bus bars
- f) Local control switches
- g) Indicators (LED type) as per requirement
- h) All necessary auxiliaries for control and supervisory circuits, and other relays as required

- i) All secondary wiring, terminal blocks, labelling and nameplates, sockets etc.
- j) Cubicle lighting including lighting fixtures and power and communication sockets
- k) Space Heaters, if applicable
- l) Coordination and provision of necessary contacts and/or ports for integration with External Monitoring system
- m) Any other item(s) not mentioned specifically but necessary for the satisfactory completion of system will be in scope of supply.

2.3.5.3 Technical Requirements:

Location	Indoor
No. of bus bars, 3-phase	1
Rated voltage , V	As per the system configuration requirement
Rated frequency Hz	50 ± 0.5 Hz
Rated circuit breaker short circuit breaking capacity	50 KA
Protection Class	Min. IP 32 or better as per requirement of location (indoor) Min. IP 65 or better (outdoor)
Control voltage, DC	Uninterrupted supply through power pack/UPS with voltage level as per system requirement
Auxiliary AC supply, 3 phase	415 ± 10 %
Material of Bus bar	Aluminum alloy / copper
Type of Earthing	Solidly earthed

2.3.5.4 List of approved makes is given in Annexure-20.

2.3.5.5 The Switchgear(s) shall be selected after conformance by specification certified by OEM for adherence to specifications laid out in the Tender Document and duly certified conformance certificate needs to be submitted before placement of purchase order.

2.3.5.6 Codes and Standards

Shall comply to all the relevant standards, but not limited to the following:

Codes	Description
IS/IEC 60529	Degrees of protection provided by enclosures (IP Code)
IEC 60439 / IS 8623	Low-voltage switchgear and control gear assemblies
IEC 60364	Low-voltage electrical installations
IS/IEC 60947	Low-voltage switchgear and control gear
IS 3072	Code of practice for installation and maintenance of Switchgear
IS 3231	Electrical relays for power system protection
IS 13703 / IEC 60269	Low voltage fuses for voltage not exceeding 1000 V AC or 1500 V DC - specification
IEC 61643	Low-voltage surge protective devices
IS 3043/IEEE 80	Code of practice for earthing

IS 14697	AC Static Transformer Operated Watt-hour and VAr-hour Meters - Class 0.2 S and 0.5 S - Specification
IS 13010	AC Watt-hour Meters - Class 0.5, 1 and 2 - Specification

2.3.5.7 Power bus-bars and insulators shall comply with specifications as given in standards/codes, ensuring adequate operational and safety features. Calculations establishing the adequacy of bus bar sizes for specified current ratings shall be submitted for approval of EIC before placing the order/start of construction of LT Switchgear unit.

2.3.5.8 Adequate protection measures shall be ensured through means of Circuit Breakers, MCCBs, Contactors, Surge Protection Devices and Fuses. The design selection of such components shall be ensured as per the system requirement and adequate design calculations/basis duly self-certified shall be submitted for approval of EIC before placing the order/start of construction of LT Switchgear unit.

All the necessary test certificates shall be submitted to establish the compliance of these protection equipment(s)/components to the operational requirements outlined in the respective codes and standards.

2.3.5.9 It shall be ensured that the equipment offered will carry the required load current at site ambient conditions specified and perform the operating duties without exceeding the permissible temperature as per standards and codes. Continuous current rating at 550C ambient in no case shall be less than 90% of the normal rating specified. The derating factors, if any employed for each component and the basis for arriving at these derating factors shall be clearly specified, duly considering the specified current ratings and ambient temperature of 550C.

2.3.5.10 Internal wiring shall be ensured through proper sizing wire, the design current carrying capacity of which shall be less than 2A/mm² for flexible copper cables/wire. All the internal wiring shall be done through properly chosen color coded wires and neatly dressed for easy identification.

2.3.5.11 The protection coordination and interlocks shall be ensured. The schematics for the same duly self-certified shall be submitted for approval of EIC before final configuration.

2.3.5.12 Following drawings and manuals shall be submitted:

- a) General arrangement of panel showing overall dimensions with foundation plan, terminal location, total weight, sectional views, operating mechanism, and Bill of materials
- b) Schematic and wiring diagram for control logic/circuitry
- c) Closing and Opening timing charts of main and auxiliary contacts
- d) Manufacturing schedule and test schedule
- e) Instruction manual along with O&M manual and individual components' catalogue

2.3.5.13 There should be provision for measurement and display of Solar Power being fed to the load bus. System should also have the capability to display the minimum, maximum and average solar power being fed to the system on daily/monthly/yearly basis.

2.3.5.14 The metering facility of the system shall comply following minimum specifications:

- a) Solar system metering should work accurately for the complete range of energy, voltage, current, frequency and power factor envisaged for this installation. Cumulative KWH will

be indicated continuously by default & other parameters through push-button flashing LED visible from the front.

- b) In case the state in which the project is planned has net/gross metering facility and as per the applicability defined in Clause 39 of Chapter-4, installation of necessary meters (net meters with accuracy class 0.2S, or as prescribed by State Regulatory Authorities) shall be ensured.
- c) Applicable standards for energy meters (as per the accuracy class requirement):
 - ✓ IS 14697 – For Class 0.2 and 0.5
 - ✓ IS 13010 – For Class 0.5, 1 and 2
- d) Accuracy Class Index of communicable multi-function energy meter: 1 or better.
- e) Memory: Non volatile memory independent of battery backup, memory should be retained up to 1 year in case of power failure.
- f) Software and Communication Compatibility: Shall be compatible to communicate and transfer all types of instantaneous and cumulative energy metering data with the Microprocessor based Data Logger System through RS-485 port. All types of necessary software and hardware to connect the meter with Microprocessor based Data Logger System shall also be supplied.
- g) Climatic Condition: The meter should function satisfactorily in India within temperature range of 0°C to 50°C and humidity up to 95%.
- h) The switchgear selected and to be installed shall be compatible for synchronization with existing captive load bus system.

2.3.6.1 Earthing and Lightning Protection

2.3.6.1 The photovoltaic modules, mounting structure, Balance of system (BOS) and other components of power plant require proper grounding for protection against any serious earth faults.

2.3.6.2 Redundant earthing methodology with two independent earth connections from each system has to be ensured for all the systems and equipment as given in the standards.

2.3.6.3 Technical Requirements:

- a) The earthing system shall consist of minimum two parallel conductors interconnected together. The detailed earthing design and calculation duly self-certified shall be submitted for EIC approval. All the necessary statutory approvals, if any required, for the system shall be taken from nodal agencies.
- b) There shall be separate earthing provision for:
 - All outdoor power electrical equipments, if any.
 - Inverters
 - Module Mounting Structure
 - Lightning arrestor
- c) All the electronic earthing shall be done through insulated cable from equipment to earth grid.
- d) The earth conductors shall be free from pitting, laminations, rust, scale and other electrical,

mechanical defects.

- e) The material of the earthing conductors shall be as follows:
- Conductors above ground level - Galvanized Iron Flat Strip/Rod (GI or Copper bonded rod)
 - Conductors buried in earth -Mild steel rod or Copper bonded rod
 - Earth electrodes -Mild steel rod
- f) Each continuous laid lengths of cable tray shall be earthed at minimum two places by G.S. flats to earthing system. The distance between earthing points shall not exceed 30 meter. Wherever earth mat is not available, necessary connections shall be done by driving an earth electrode in the ground.
- g) Connections between earth leads and equipment shall normally be of bolted type. Contact surfaces shall be thoroughly cleaned before connections. Equipment bolted connections after being tested and checked shall be painted with anti-corrosive paint/compound. In case, the bolt type configuration is not able to ensure sufficient contact, the same shall be ensured through additional welding between the two. Portion of galvanized structure which undergoes welding at site shall be coated with two coats of cold galvanizing and anti-corrosion paint afterwards.
- h) Connections between equipment earthing leads and between main earthing conductors shall be of welded type. For rust protection, welds should be treated with red lead compound and afterwards thickly coated with bitumen compound. All welded connections shall be made by electric arc welding. In case of Copper bonded rods, necessary bonding mechanism as prescribed by OEM to be ensured.
- i) The welded joint needs to be painted with Cold GI paint (eg. Zinc cote, etc.) according to the manufacturer's specification for paint thickness (16 mm rod – minimum 75 microns, and 10 mm rods – minimum 65 microns) applied either through spray mode or direct liquid application. In case the weld joints are coming in the portion buried under earth, an additional layer of Enamel paint needs to be applied on the weld joint.
- j) Earth pit shall be constructed as per IS:3043. Electrodes shall be embedded below permanent moisture level. Earth pits shall be treated with salt and charcoal if average resistance of soil is more than 20 ohm meter. On completion of installation, continuity of earth conductors and efficiency of all bonds and joints shall be checked. Earth resistance at earth terminations shall be measured and recorded. All equipment required for testing shall be furnished by contractor. Earth pit inner diameter to be of minimum 300 mm.
- k) In general industrial practice, the standard philosophy of providing redundancy by facilitation of two point contacts between structure and grid, or structure/equipment and earth pits (GEP or NEP), or structure and structure has to be ensured.
- l) **Solar Array Earthing**

Each Module Mounting Structure (MMS), SPV Module frames, Metallic Junction Boxes, Metal frames/Panel, Metallic Pipes of the solar array, etc. shall be effectively earthed by two separate and distinct connections to earthing system. Earthing system for solar array shall consist of earth mat/Earth grid to be laid at the minimum depth of 600 MM below the ground. Earth mat shall be a mesh of interconnected Galvanizing

Steel (GS) flat/MS rod laid in the solar farm for the purpose of earthing/grounding. Equipment and structure in the solar farm shall be earthed in compliance to the IS: 3043 (Code of Practice for Earthing) and Indian Electricity Rules/Acts.

- m) The detailed design and calculations to determine the number of earth pits and size of earth mat conductor duly certified by Independent Chartered Electrical Engineer shall be submitted for EIC approval.
- n) The earthing resistance must not exceed the limits generally in practice for such applications i.e. 4Ω .

2.3.6.4 The Earthing/Lightning Protection System shall be selected after conformance by self-certified for adherence to specifications laid out in the Tender Document. A duly certified conformance certificate needs to be submitted before placement of purchase order.

2.3.6.5 Codes and Standards:

Shall comply to all the relevant standards, but not limited to the following:

Codes	Description
IS 3043	Code of practice for Earthing
IEEE 80	IEEE guide for safety in AC substation grounding
IEEE 142	IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
IS 2309	Code of Practice for the protection of building and allied structures against lightning
IEC 62305	Protection against Lightning
IS 4736	Hot-dip Zinc coatings on MS Tubes
Other Relevant Codes/Guidelines/Acts	
Indian Electricity Act	
Indian Electricity Rules	

2.3.6.6 The source of over voltage can be lightning or other atmospheric disturbance. Lightning Protection System (LPS) i.e. lightning conductors or mesh shall be provided so as to prevent direct lightning strike into the PV modules. It is to be ensured that adequate separation distance is kept between the LPS and PV modules. Main aim of over voltage protection is to reduce the overvoltage to a tolerable level before it reaches the PV or other sub-system components.

2.3.6.7 The Station/Intermediate Class Early Streamer Emission (ESE) technology Lighting Arrestor (LA) has to be designed as per applicable standards so that whole of the Solar PV Plant is protected. Design basis report duly self-certified has to be submitted prior to finalization of drawings for approval of EIC.

2.3.6.8 Down conductors for lightening protection shall be as short and straight as practicable and shall follow a direct path to earth electrode. Each down conductor shall be provided with a test link at 1000 mm above ground level for testing but it shall be inaccessible to interferences. No connections other than the one direct to an earth electrode shall be made below a test point. All joints in the down conductors shall be welded type.

2.3.6.9 Each LA shall have to be earthed through suitable size earth bus with separate earth pits.

2.3.6.10 Necessary concrete foundation or any other arrangement for holding the lightning conductor in position is to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.

2.3.6.11 The lightning conductor and structures shall be earthed through flats as per applicable standards with earth pits. Each lightning conductor shall be fitted with individual earth pit as per required standards including accessories, and providing masonry enclosure. Else, a matrix of lightning conductors is to be created which will be required to be connected to an earth.

2.3.6.12 The scheme, drawings and detailed specifications of the PV array lightning protection equipment and earthing arrangement duly certified by IIT/NIT or any Govt. reputed institution of same field approved by DLCSUPVA shall be submitted for EIC approval.

2.3.5 Cabling:

2.3.9.1 The DC Cable shall be 1.1kV (DC) grade, heavy duty, compacted copper conductor, XLPE insulated, PVC inner-sheathed, galvanized steel wire/strip armored, fire/flame retardant low smoke FRLS PVC outer sheathed. The cables shall in general conform to IS 7098 (Part-I). The cable from SMUs to Inverters shall be ozone-resistant according to EN50396, UV-resistant according to UNE-HD 605:2008 (HD605/A1).

2.3.9.2 The power cable shall be 1.1kV grade, heavy duty, stranded aluminium/copper conductor, UV resistant (for outdoors) PVC type-A insulated, galvanized steel wire/strip armored, fire/flame retardant low smoke (FRLS) extruded PVC type ST-1 outer sheathed. The cables shall, in general, conform to IS 1554 Part-I&II and other relevant standards.

2.3.9.3 Control Cables: The cable shall be 1.1kV grade, heavy duty, stranded copper conductor, PVC type-A insulated, galvanized steel wire/strip armored, flame retardant low smoke (FRLS) extruded PVC type ST-1 outer sheathed. The cables shall, in general, conform to IS 1554 Part-I & other relevant standards.

2.3.9.4 Technical Requirements:

- a) Solar cables must have TUV certification
- b) Straight through joints should be avoided.
- c) The cables shall have an ambient operating temperature range of 00C to +500C.
- d) Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.
- e) The cables shall be adequately insulated for the voltage required and shall be suitably color coded for the required service.
- f) All power cables shall be tested at the site as per the standard in front of EIC/nominated officer present at the site. The Cables shall also confirm to IEC 60189 for test and measuring methods and they should be UV Protected. No cable should be left open.
- g) Data sheets of individual cable sizes shall be submitted. Drum numbers and drum length details shall be submitted with each consignment.
- h) Cables must be selected so as to minimize the risk of earth faults and short- circuits. All exposed DC cables must be flexible single core and must satisfy the above

criteria.

- i) XLPE insulation shall be suitable for a continuous conductor temperature of 900C and short circuit conductor temperature of 2500C.
- j) PVC insulation shall be suitable for continuous conductor temperature of 700C and short circuit conductor temperature of 1600C.
- k) All the cables of size 50 mm² or higher shall be armored, to fetch mechanical protection of sheath, insulation and conductor.
- l) If the data transmission length is more than 100m distance or as required, Optical Fiber cable shall be used.
- m) De-rating factors for various conditions of installations, including the following but not limited to, shall be considered while selecting the cable sizes:
 - Variation in ambient temperature for cables laid in air
 - Grouping of cables
 - Variation in ground temperature and soil resistivity for buried cables
- n) Following minimum marking shall be provided on the outer sheath -
 - Cable size and voltage grade
 - Word 'FRLS' at every 5 mt
 - Sequential marking of length of the cable in mt at every 1 mt

In addition, the printing shall be progressive, automatic, in line and marking shall be legible and indelible.
- o) Cables are to be routed neatly in standard manner through GI perforated cable trays & cable marker to be placed for future identification. For array wiring, suitable cable tray or metal conduit with proper support shall be provided and fastened in accordance with relevant standards, industry codes and Indian Electricity Grid Code.
- p) Cable trays shall have standard width of 150 mm, 300 mm & 600 mm and standard lengths of 2.5 meter. Thickness of mild steel sheets used for fabrication of cable trays and fittings shall be minimum 2 mm. The thickness of side coupler plates shall be minimum 3 mm.
- q) For protection of unarmored cables, suitable conduits shall be provided.
- r) The switches/circuit breakers/connectors required should conform to IEC 60947 (Part-I, II & III) or IS 60947 (Part-I, II & III) EN 50521.

2.3.9.5 List of approved makes is given in Annexure-20.

2.3.9.6 The Cables shall be selected after conformance by self-certification for adherence to specifications laid out in the Tender Document. A duly certified conformance certificate needs to be submitted before placement of purchase order.

2.3.9.7 Codes and Standards:

Codes	Standards
TUV specification 2 Pfg 1169/08.2007	DC cable for photovoltaic system

IS 1554 (Part-I)	Specification for PVC insulated (Heavy Duty) electric cables: for working voltages up to and including 1100V
IS 1554 (Part-II)	Specification for PVC insulated (Heavy Duty) electric cables: for working voltages from 3.3kV up to and including 11kV
IS 3961	Recommended current rating for cables
IS 3975	Low carbon galvanized steel wires, formed wires and tapes for armouring of cables – Specifications
IS 5831	PVC insulation and sheath of electrical cables
IS 7098 (Part-I)	Specification for Cross linked polyethylene insulated PVC sheathed cables for working voltage up to and including 1100V
IS 7098 (Part-II)	Cross linked polyethylene insulated thermoplastic sheathed cables for working voltages from 3.3kV up to and including 33kV
IS 7098 (Part-III)	Cross linked polyethylene insulated thermoplastic sheathed cables for working voltages from 66kV up to and including 220kV
IS 8130	Conductors for insulated electrical cables and flexible Cords
IS 10810	Methods of test for cables
IEC 754	Test on gases evolved during combustion of materials from electric cables
IEC 332	Tests on electric cables under fire conditions. Part-3: Tests on bunched wires or cables (Category-B)
IS 10418	Specification for drums for electric cables
ASTM-D 2843	Standard test method for density of smoke from the burning or decomposition of plastics
ASTM-D 2863	Standard method for measuring the minimum oxygen concentration to support candle like combustion of plastics (Oxygen Index)

2.3.9.8 Cabling on DC side of the system shall be as short as possible to minimize the voltage drop in the wiring. Voltage drop on the DC side from array to the inverter should not be more than 2%. In the light of this fact, the cross-sectional area of the cable should be so chosen such that the voltage drop introduced by it shall be within 2% of the system voltage at peak power. Necessary design calculations in this regard duly certified by IIT/NIT/NABL Lab or any Govt. reputed institution approved by university shall be submitted to EIC for approval.

2.3.9.9 For the AC cabling from inverter to Feeder Bus, armored PVC insulated cables shall be used.

2.3.9.10 The sizing of cables for entire Solar Plant shall be based on the maximum load flow considering the total voltage drop (DC and AC) within the permissible limit of 4% (DC – 2% and AC – 2%) and maximum short-circuit withstand capability. The design calculations for sizing of the cable duly certified by IIT/NIT/NABL Lab or any Govt. reputed institution approved shall be submitted for EIC approval. The complete cable shall be laid through trench or tray (including preparation of trenches and trays with manpower and material, if required) and proper arrangement shall be made for end termination, glanding and lugging

with supply of material.

2.3.9.11 Overload protection is to be provided. Design Overload capacity of 125% of continuous rating for 10 sec has to be ensured. The principle aim for this protection is to reduce the over voltage to a tolerable value before it reaches the PV or other subsystem components. The source of over voltage can be lightning or any other atmospheric disturbance or internal system disturbance.

2.4 If any ambiguity found in technical specifications then the specifications with latest amendment of MNRE /SECI will be applicable.

Chapter-6
GENERAL CONDITIONS OF CONTRACT

Attached, separately

Chapter-7
ANNEXURES

LIST OF ANNEXURES

(TO BE FILLED AND FURNISHED ALONG WITH THE BID WITH RELEVANT ENCLOSURES)

Annexure No.	Details of information/documents to be submitted by bidder
Annexure – 1	FORMAT OF THE COVERING LETTER
Annexure – 2	BIDDERS GENERAL INFORMATION
Annexure – 3 (A)	FORM OF TENDER (TECHNO-COMMERCIAL BID)
Annexure – 3 (B)	FORM OF TENDER (PRICE BID)
Annexure – 4	PERFORMA OF DECLARATION OF BLACK LISTING/De-barring
Annexure – 5	UNDERTAKING FOR NON-ENGAGEMENT OF CHILD LABOUR
Annexure - 6	DECLARATION ABOUT THE RELATIONSHIP, IF ANY, WITH DLCSUPVA'S DIRECTOR
Annexure - 7	PERFORMA OF CERTIFICATE FOR NON-INVOLVEMENT OF AGENT
Annexure - 8	UNDERTAKING BY THE BIDDER(S) TO COMPLY NON-TAMPERING OF TENDER FORMS & ELECTRONIC DATA
Annexure - 9	LETTER OF WAIVER OF CONDITIONS / DEVIATIONS
Annexure – 10	FORM OF BANK GUARANTEE FOR EMD
Annexure – 11	FORM OF BANK GUARANTEE FOR SECURITY DEPOSIT
Annexure – 12	FORMAL AGREEMENT WITH DLCSUPVA
Annexure – 13	FORMAT FOR GIVING CONSENT AND BANK DETAILS
Annexure - 14	CHECKLIST FOR BID SUBMISSION
Annexure – 15	LIST OF CONNECTED LOADS AND DG DETAILS (INCLUDING NUMBERS AND RATINGS OF EACH)
Annexure – 16	INDICATIVE SITE LAYOUT
Annexure – 17	PERFORMANCE GUARANTEE TEST / YEARLY PERFORMANCE EVALUATION – FOR SOLAR PV SYSTEM)
Annexure – 18	PERFORMANCE GUARANTEE TEST / YEARLY PERFORMANCE EVALUATION – FOR BATTERY SYSTEM)
Annexure – 19	LIST OF MAJOR TAGGED ITEMS
Annexure – 20	LIST OF APPROVED MAKES
Annexure – 21	LIST OF APPROVED THIRD PARTY INSPECTION (TPI) AGENCIES
Annexure – 22	GLOSSARY OF TERMS

Annexure-1

**FORMAT OF THE COVERING LETTER
(On Company's / Firm's letterhead)**

To, Registrar,
DLCSUPVA
Rohtak

Dear Sir,

Date:

Place:

Subject: Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

Please find enclosed our bid for Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

We hereby confirm the following:

The bid for the subject tender is being submitted by _____ (Name of the Bidder) who is the Bidder in accordance with the conditions stipulated in the Tender document.

We _____ (name of the Bidder), as the Bidder, would be responsible for completion and performance of the anticipated Scope of Work.

We have examined in detail and have understood, and abide by, all the terms and conditions stipulated in the Tender document issued by DLCSUPVA and in any subsequent communication sent by DLCSUPVA. Our bid for the subject tender is consistent with all the requirements of submission as stated in the Tender document or in any of the subsequent communications from DLCSUPVA. The information submitted in our bid for the subject tender is complete, is strictly as per the requirements as stipulated in the Tender document and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our bid for the subject tender. If any information, document or declaration submitted in/with our bid for the subject tender, is found to be incorrect at a later date, we indemnify DLCSUPVA against any loss due to this and DLCSUPVA may take any action as deemed fit.

The Bidder designate Mr./Ms. _____ (mention name, designation, contact address, phone no. fax no. etc), as our Authorized Signatory and Contact Person who is authorized to perform all tasks including, but not limited to providing information, responding to enquiries, entering into contractual commitments on behalf of the Applicant etc. in respect of our bid for the subject tender.

Signed for and on behalf of

(Sign. & Seal of Authorized Signatory)

Annexure-2

BIDDER'S GENERAL INFORMATION

1	Bidder Firm / Company Details	
1.1	Full Legal Name of Bidder's Firm / Company	
1.2	Structure of the Bidder's Firm / Company	Public Ltd. Co. / Pvt. Ltd. Co. / Partnership / Proprietorship
1.3	CIN	
1.4	Registration No.	
1.5	Year of Registration	
1.6	Registered Office Address	
1.7	Telephone Number	
1.8	Fax Number	
1.9	e-mail Address	
1.10	PAN	
1.11	EPF Registration No.	
1.12	ESIC Registration No.	
1.13	Principal Place of Business	
1.14	GSTIN	
2	Details of Personnel authorized for signing Application	
2.1	Name	
2.2	Designation	
2.3	Address	
2.4	Mobile Number	
2.5	e-mail ID	

Annexure-3
Annexure-3(A)

(To be uploaded with techno-commercial part of the tender document)

FORM OF TENDER
(To be filled up by the Tenderer)
For Techno-Commercial Bid

Serial No.

Date:

From:

To,
Registrar
DLCSUPVA Rohtak

Dear Sir,

Having examined the Tender Documents consisting of the Short Tender Notice, Notice inviting tender, Instructions to Bidder, Special Conditions of Contract, Job Specifications, General Conditions of Contract, Special Instructions to bidders for participation in e-tendering, Specifications, Layout Plan (enclosed with tender), Drawings (enclosed with tender), Time Schedule, Form of Contract, Form of Schedule of Rates, and Addendum(s), if any to the Tender Documents, and having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of DLCSUPVA. relative to the work tendered for in connection with the _____ (Name of the Project) and having conducted a thorough study of the job site(s) involved, the site conditions, the climatic conditions, labour, power, water, material and equipment availability, the transport and communication facilities and temporary office accommodation and all other facilities and things whatsoever necessary for or relative to the formulation of the tender or the performance of work, I/we hereby submit my/our tender offer for the performance of proposed work in accordance with the terms and conditions and within the time mentioned in the Tender Documents.

I/We hereby further state that I/We/None of us (in the case of partnership firm) and none of our Directors (in the case of a Company) was/were employed in DLCSUPVA., during the period of 2 (two) years immediately preceding the date hereof OR I/We hereby declare that I/Shri _____ one of our partners (in the case of partnership firm/Directors in the case of a Company) was employed in DLCSUPVA., during the period of 2 (two) years immediately preceding the date hereof and that I/Shri _____ have/has obtained previous permission of DLCSUPVA. to make this tender.

I/We have annexed to this Bid all the annexure mentioned in ITB Clause 6.4.

I/We hereby undertake that the statements made herein/information given in the Annexures referred above are true in all respects and that in the event of any such statement or information being found to be incorrect in any particular, the same may be construed to be a misrepresentation entitling DLCSUPVA. to avoid any resultant contract.

I/We further undertake as and when called upon by DLCSUPVA. to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

I/We confirm having deposited Earnest Money of Rs. (Rupees _____) online on e-tender website.

(Signature(s) of the Tenderer(s))

Name & Designation of authorized person signing the Tender on behalf of the Tenderer (s)

Full Name and address of the Bidder(s)

Witness:

Signature:

Name:

Occupation:

Annexure-3(B)

(To be uploaded with price bid part of the tender document and not with techno-commercial part)

FORM OF TENDER
(To be filled up by the Tenderer)
For Price Bid

Serial No.

Date:

From

To

Registrar

DLCSUPVA, Rohtak

Dear Sirs,

Having examined the Tender Documents consisting of the Short Tender Notice, Notice inviting tender, Instructions to Bidder, Special Conditions of Contract, scope of work and technical specifications, General Conditions of Contract, special instructions to bidders for participation in e-tendering, Specifications, Layout Plan (enclosed with tender), Drawings (enclosed with tender), Time Schedule, Form of Contract, Form of Tender, Form of Schedule of Rates, and Addendum(s), if any to the Tender Documents, and having understood the provisions of the said Tender Documents and having thoroughly studied the requirements of DLCSUPVA. relative to the work tendered for in connection with the (Name of the Project) and having conducted a thorough study of the job site(s) involved, the site conditions, the climatic conditions, labour, power, water, material and equipment availability, the transport and communication facilities and temporary office accommodation and all other facilities and things whatsoever necessary for or relative to the formulation of the tender of the performance of work, I/we hereby submit my/our tender offer for the performance of proposed work in accordance with the terms and conditions and within the time mentioned in the Bid Documents at the rate(s) quoted by me/us in the accompanying Schedule of Rates based on the Form of Schedule(s) of Rates included within the Tender Documents and arrived at a total contract value of Rs. (To be submitted with price part and not with techno-commercial part) (Rupees To be submitted with price part and not with techno-commercial part only) based on an application of the rates tendered in the accompanying Schedule(s) of Rates to the relative quantities indicated in the Form Schedule(s) of

Rates forming part of the Tender Documents.

If the work or any part thereof is awarded to me/us, I/ We undertake to perform the work in accordance with the Contract Documents as defined in the Form of Contract forming part of the Tender Documents and accept the terms and conditions of Contract as laid down therein and undertake within 15 (fifteen) days of receipt of acceptance of Tender to pay to and/or deposit with DLCSUPVA a sum which together with the amount of earnest money deposited by me/us in terms hereof, shall make () of total contract value as specified in the Acceptance of Tender for the purpose of security deposit, by any one or more of the modes of payments specified in this behalf in the General Conditions of Contract, and to commence work at each job site(s) involved within 15 (fifteen) days of handing over the job site or any part thereof to me/us, and to sign the formal Contract in the terms of the form of contract forming part of Tender Documents, within 21 (fifteen) days of receipt of Letter of Award from and on behalf of DLCSUPVA., in this behalf failing which DLCSUPVA., shall be at liberty, without reference to me/us and without prejudice to any of its rights or remedies, to terminate the Contract and/or to forfeit the earnest money deposited in terms hereof.

I/We further undertake to keep my/our tender offer valid for a period of not less than 4 (Four) months from the scheduled date of opening of Tenders as specified in the General Instructions to Tenderer forming part of the Tender Documents.

I/We have annexed to this Bid the documents mentioned in ITB Clause 6.5.

I/We hereby undertake that the statements made herein/information given in the Annexures referred to above are true in all respects and that in the event of any such statement or information being found to be incorrect in any particular, the same may be construed to be a misrepresentation entitling DLCSUPVA. to avoid any resultant contract.

I/We further undertake as and when called upon by DLCSUPVA. to produce, for its inspection, original(s) of the document(s) of which copies have been annexed hereto.

(Signature(s) of the Tenderer(s))

Name & Designation of authorized person signing the Tender on behalf of the Tenderer (s)

Full Name and address of the Bidder(s)

Witness:

Signature:

Name:

Occupation:

Annexure-4**PERFORMA OF DECLARATION OF BLACK LISTING/De-barring**

Name of Job: Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s. _____ which is submitting the accompanying Bid/Tender nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a Managing Partner have been placed on black list or holiday list declared by DLCSUPVA or any other Public Sector Undertaking (PSU), or the State or Central Government, except as indicated below:

(Here give particulars of blacklisting or De-barring, and in absence thereof state “NIL”)

In the case of a Partnership Firm:

We hereby declare that neither we, M/s. _____, submitting the accompanying Bid/Tender nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern have or has been placed on blacklist or holiday list declared by DLCSUPVA. or any other Public Sector Undertaking (PSU), or the State or Central Government, except as indicated below:

(Here give particulars of blacklisting or De-barring and in the absence thereof state “NIL”)

In the case of Company:

We hereby declare that we have not been placed on any holiday list or black list declared by DLCSUPVA or any other Public Sector Undertaking (PSU), or the State or Central Government, except as indicated below:

(Here give particulars of black listing or De-barring and in the absence thereof state “NIL”)

It is understood that if this declaration is found to be false in any particular, DLCSUPVA, it shall have the right to reject my/our bid, and if the bid has resulted in a contract, the contract is liable to be terminated.

Place:

Signature of Bidder:

Date:

Name of Signatory:

UNDERTAKING FOR NON-ENGAGEMENT OF CHILD LABOUR

I/We hereby declare that:

- a) We are committed to elimination of child labour in all its forms.
- b) Neither we nor any of our nominated sub-contractor(s) are engaging Child Labour in any of our work(s) in terms of the provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable laws.
- c) We as well as our nominated sub-contractor(s) undertake to fully comply with provisions of The Child Labour (Prohibition and Regulation) Act, 1986 and other applicable labour laws, in case the work is awarded to us.
- d) It is understood that if I/We, either before award or during execution of Contract, commit a transgression through a violation of Article b/c above or in any other form, such as to put my/our reliability or credibility in question, the DLCSUPVA is entitled to disqualify us from the Tender process or terminate the Contract, if already executed or exclude me/us from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the DLCSUPVA. Such exclusion may be for a period of 1 year to 3 years as per the procedure prescribed in the guidelines for De-barring of the DLCSUPVA.
- e) I/We accept and undertake to respect and uphold the DLCSUPVA's absolute right to resort to and impose such exclusion.

Place:

Signature of Bidder:

Date:

Name of Signatory:

Annexure-6

**DECLARATION ABOUT THE RELATIONSHIP, IF ANY, WITH DLCSUPVA'S
DIRECTOR**

For the purpose of Section 297/299 of the Companies Act, 1956, we certify that to the best of my/our knowledge:

- (i) I am not a relative of any employee of DLCSUPVA;
- (ii) We are not a firm in which a Director of DLCSUPVA or his relative is a partner;
- (iii) I am not a partner in a firm in which employee of DLCSUPVA or his relative is a partner;
- (iv) We are not a private company in which employee of DLCSUPVA is a Member or Director;
- (v) We are not a company in which employee DLCSUPVA hold more than 2 % of the paid-up share capital of our company or vice-versa.

(STAMP & SIGNATURE OF TENDERER)

Annexure-7

PERFORMA OF CERTIFICATE FOR NON-INVOLVEMENT OF AGENT

This is to certify that we have not engaged / involved any Agent/ Representative/ BIDDER/ Retainer/ Associates who is not an employee of _____(name of your company) on payment of any remuneration in India or abroad for this Project. Therefore, no agent's/ Representative's/ BIDDER's/ Associate's commission is payable in India or abroad against this Contract.

Yours faithfully,

For

Annexure-8

(On company letterhead)

**UNDERTAKING BY THE BIDDER(S) TO COMPLY NON-TAMPERING OF
TENDER FORMS & ELECTRONIC DATA**

**Name of Work: Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid
Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi
Chand State University of Performing and Visual Arts, Rohtak (Haryana).**

I/We have downloaded the tender form from the internet site <https://dlcsupva.ac.in> or <http://etenders.gov.in> and I/we have not tampered with / modified the tender forms and electronic data contained therein in any manner. In case, if the same is found to be tampered with / modified, I / we understand that my / our tender will be summarily rejected and full Earnest Money Deposit will be forfeited and I/we am/are liable to be banned from doing business with DLCSUPVA and/or prosecuted.

SIGNED FOR AND ON BEHALF OF

(Name of Bidder)

Seal & Signature of Bidder

Date:

Place: —

NOTE:

This declaration should be signed by the Bidder's authorized representative who is digitally signing the Bid, On Company Letterhead, and scanned copy to be uploaded.

Annexure-9

Date

On company's letterhead

LETTER OF WAIVER OF CONDITIONS / DEVIATIONS

Name of Job: Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

We M/s. _____ hereby agree to fully comply with, abide by and accept without variation, deviation or reservation all technical, commercial and other conditions whatsoever of the Bidding documents and all Addendum / Corrigenda / Amendments issued by DLCSUPVA.

We further hereby waive, withdraw and abandon any and all deviations, variations, objections or reservations whatsoever hereto set out, given or indicated in our offer, clarifications, correspondence, communications or otherwise with a view that the final price bid submitted may be treated to confirm in all respects, with the terms and conditions of the said Bidding documents including all Addendum / Corrigenda / amendments.

We further hereby confirm that the currencies of price in the price bid are as per the provisions of the Bidding documents and there is no deviation to the provisions in the final price bid.

(STAMP & SIGNATURE OF BIDDER)

Place:

Date:

Annexure-10

FORM OF BANK GUARANTEE FOR EMD

Earnest Money will be deposited/submitted online only. Earnest Money in shape of Bank Guarantee will not be accepted.

Annexure-11

FORM OF BANK GUARANTEE FOR SECURITY DEPOSIT

Earnest money as bid security will be deposited online on e-tender only.

FORMAL AGREEMENT WITH DLCSUPVA**Agreement Form**

Agreement

This agreement, made the _____ day of _____ between _____ (name and address of Employer) [hereinafter called “the Employer] and _____ (name and address of contractor) hereinafter called “the Contractor” of the other part.

Whereas the Employer is desirous that the Contractor execute _____ (name and identification number of Contract) (hereinafter called “the Works”) and the Employer has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein, at a cost of Rs. _____

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying the defects wherein Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
4. The following documents shall be deemed to form and be ready and construed as part of this Agreement viz.
 - i) Letter of Acceptance
 - ii) Notice to proceed with the works;
 - iii) Contractor’s Bid
 - iv) Condition of Contract: General and Special
 - v) Contract Data
 - vi) Additional condition
 - vii) Drawings
 - viii) Bill of Quantities and
 - ix) Any other documents listed in the Contract Data as forming part of the Contract.

In witnessed whereto the parties there to have caused this Agreement to be executed the day and year first before written.

The Common Seal of _____

Was hereunto affixed in the presence of:

Signed, Sealed and Delivered by the said _____

in the presence of:

Binding Signature of Employer _____

Binding Signature of Contractor _____

**FORMAT FOR GIVING CONSENT AND BANK DETAILS
ON LETTERHEAD**

Date:

To
Registrar
DLCSUPVA
Rohtak

Dear Sir,

With reference to the P.O / W.O. / Contract ref. no. _____ dated _____ awarded to us by DLCSUPVA, we hereby give our consent to accept the related payments of our claims/bills on DLCSUPVA through Cheques or Internet based online e-payments system at the sole discretion of DLCSUPVA. Our Bank account details for the said purpose are as under:

S. No.	Particulars	Details
1	Name and address of the Beneficiary	
2	Account Number of Beneficiary	
3	Account Classification (CA/CC-11 or 29) & SB-10 as per cheque leaf.	
4	Name & Address of the Bank Branch (where payments are to be sent by DLCSUPVA)	
5	The 09 Digit MICR code of the Branch (as appearing on the MICR cheque)	
6	IFSC Code of the bank Branch	
9	Any other Particulars (to be advised by beneficiary for the e-payments purposes)	
10	Vendor Code (to be filled by DLCSUPVA's Deptt Only)	
11	PERMANENT ACCOUNT NUMBER	
12	Mobile number (for SMS alerts)	

Please attach a blank copy of the cancelled cheque/photocopy of the cancelled cheque issued by your bank relating to the above account number for verifying the accuracy of bank account is enclosed.

A Copy of PAN Card duly attested by authorized signatory for verifying the accuracy of the PAN is enclosed.

I/We hereby declare that the particulars given above are correct and complete.

Signature Of account Holder
With Company Stamp (if a
company)

Date:

Place:

(Encl: one cheque/photocopy of cheque duly cancelled & copy of PAN card)

*** We hereby confirm that the above bank account details of beneficiary are correct in all respects and the account of beneficiary (DLCSUPVA Vendor) is maintained at out bank branch

(Name of the Bank & Branch)

Authorized signatory

*** Verification required only in case

- a) Vendors not providing a cancelled cheque leaf or if vendors name is not printed/appearing on the cancelled cheque leaf submitted to DLCSUPVA office.
- b) Change in existing bank details.

CHECKLIST FOR BID SUBMISSION

Bidders are requested to duly fill in the following checklist. This checklist gives only certain important items to facilitate the bidder to make sure that the necessary data / information as called for in the Bid Document has been submitted by them along with their offer. This, however, does not relieve the bidder of his responsibilities to make sure that his offer is otherwise complete in all respects.

Please ensure compliance and tick (√) against following points:

S. No.	Particulars	Submitted	Enclosed at page number of the tender
1.	Offer complete in all respects with pages in sequential order, original Bid Document including drawings, Annexures, addendum(s) (if any)		
2.	Confirm that the following details have been submitted in the Unpriced part:		
i	Annexure-1 : Covering Letter digitally signed by the authorized signatory along with Power of Attorney or any other proof of authority, in favour of the person who has signed the tender (or a copy thereof duly attested by a Gazetted Officer)		
ii	Annexure-2: Bidders General Information		
iii	Annexure- 3(A) and 3(B) : Form of tender		
iv	Annexure-4 : Performa of declaration of black listing/De-barring		
v	Annexure-5 : Undertaking for non-engagement of child labour		
vi	Annexure-6 : Declaration about the relationship, if any, with DLCSUPVA's Director		
vii	Annexure-7 : Performa of certificate for non-involvement of agent		
viii	Annexure-8: Undertaking by the bidder(s) to comply non-tampering of tender forms & electronic data		
ix	Annexure-9 : Letter of Waiver of Conditions / Deviations		
xi	Annexure-13 : Bank details		

S. No.	Particulars	Submitted	Enclosed at page number of the tender
xii	Tender document along with Addendum/ Corrigendum/Amendment, if any, issued for the tender duly stamped and signed on each page		
xiii	Annexure-22 Bid security Declaration		
xiv	Annexure-23 Country of origin and percentage of local content		
xv	Annexure-25 PEROFORMA FOR DECLARATION ON NCLT		
3.	Confirm that the Price Bid (in requisites formats strictly complying with the requirements) has been duly filled in for each item & digitally signed and Annexure-3(B) Form of Tender has been submitted along with price bid		
4.	Confirm that all forms are enclosed with the bid duly digital signed by authorized person(s)		
5.	Proof of online EMD deposited and tender fee		

Place:

Signature of Bidder:

Date:

Name of Signatory:

Annexure-15

LIST OF CONNECTED LOADS AND DG DETAILS (INCLUDING NUMBERS AND RATINGS OF EACH)

Contract demand: 2000 KVA

Transformer:

1. 2000 KVA- 3 No. (in parallel operation)

DGs: (Sr. no. 1 & 2, 3&4 are in parallel operation)

1. 1500 KVA- 2 Nos

2. 750 KVA- 1 No.

3. 125 KVA- 3 No.

4. 140 KVA- 1 No.

5. 63.5 KVA- 1 No.

Existing solar system:

1. 164kWp on rooftop on design department

INDICATIVE SITE LAYOUT



Annexure-17

**PERFORMANCE GUARANTEE TEST / YEARLY PERFORMANCE EVALUATION
(FOR SOLAR PV SYSTEM)**

For successful establishment of Performance Guarantee Test at the end of 12 months and 24 months from the project commissioning, following minimum energy generation guarantee for Solar Power System shall be met:

Average GHI Index (A)	Capacity of y kWp Solar Power Plant in kWp considering the first year degradation of solar PV modules (B)	Minimum Annual Generation* Guarantee for PGT (A x B x 365 x 0.9) (in kWh)
X	y*99%	

* Note : Solar Energy generation shall be measured at the input side of the inverter(s).

The respective degradation of solar PV modules will be taken care as per specification during 2nd year.

X	y*98.6%	
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Energy losses attributable to following events shall not be considered for performance guarantee evaluation:

- Shut-downs caused by factors not controlled by the Contractor or its subcontractors
- Force Majeure
- Vandalism or theft.
- Modifications at the site or its surroundings due to factors out of control of the Contractor (i.e. shadowing due to new installations on the site or next to the site, etc).

LIST OF MANDATORY SPARES

Sl. No.	Item Description	UDNITs
1	Solar PV Modules	0.5% of total nos. of new SPV Modules installed
2	String Inverter(s)	1 nos.

LIST OF APPROVED MAKES

S. No.	Description of material	Make
1	N-Type Topcon Bifacial	Waaree/Vikram Solar/Tata Power Solar/Adani/Future
2	Inverter	ABB/SMA/Sungrow/Havell's/Siemens/K-Solar
3	Cables	KEI/Havell's/RR/LAPP
4	Connectors	Lumberg/Bizlink/Multi Contact/COYO/Staubli
5	Fuse, MCB, MCCB, Terminal Block, ELCB	ABB/Schneider/L&T/Havell's/Mitsubishi/Bussman/Ferraz
6	AC Switchgear	ABB/Areva (Schneider)/C&S/L&T/CG/Siemens
7	CT/PT	Mehru/CGL/ Alstom/ or Equivalent Make or State Electricity Authority Approved make
9	Lightning Arrestor ESE	LPI/Ellipse/Indelec/Erico
10	Net Meters	State Electricity Authority Approved make
11	Steel Structure	Hot Dip GI TATA/JINDAL/RINL/SAIL

For Solar PV Module, Inverter/PCU, Cables, SMBs, Switchgear, CTs/PTs and MMS, the OEM must have a manufacturing with testing facility in India.

For Solar PV Modules and Inverter/PCU, the contractor shall ensure that the OEM is 100% Indian Origin with maximum local content and having testing facility in India and Approved List of Module Manufacturer of SECI/MNRE.

If Contractor chooses equipment/system/components of an equivalent make, Contractor shall submit for DLCSUPVA approval a conformance certificate generated/certified from any of the Third Party Inspection Agency/Laboratory (list given in Annexure-21) certifying that the selected model of a particular make is compliant to the specifications outlined for that particular equipment/system/components in this Tender Document, before placement of Purchase Order for that equipment/system/components to an equivalent make manufacturer.

Annexure-20

List of TPI Agencies

1. The all material will be inspected by expert committee constituted by DLCSUPVA for said purpose.

Annexure-21

Format of Bid Security Declaration from bidders in lieu of Earnest Money Deposit (On Bidders' Letter Head)

I/We, the authorized signatory of M/s _____, participating in the subject Tender for the job of _____, do hereby declare that:

We understand that according to the conditions of this Tender Document, the bid must be supported by a Bid Securing Declaration In lieu of Bid Security.

We unconditionally accept the conditions of this Bid Securing Declaration. We understand we shall stand automatically suspended from being eligible for bidding in any tender in DLCSUPVA for 1 year from the date of opening of technical bid of this tender if we breach our obligation(s) under the tender conditions if we:

- 1) withdraw/ amend/ impair/ derogate, in any respect, from our bid, within the bid validity; or
- 2) being notified within the bid validity of the acceptance of our bid by DLCSUPVA:
 - (a) refuse to or fail to produce the original documents for scrutiny or the required Performance Security within the stipulated time under the conditions of the Tender Document.
 - (b) Fail or refuse to sign the contract.

Signature and seal of authorized signatory of bidder
Name of authorized signatory:

Annexure-22

**Declaration on Country of Origin and Percentage of Local content
(To be submitted on letterhead)**

I/ We hereby declare that all Items mentioned in uploaded Purchase Requisition (PR) towards technical estimate are of Indian Origin with 100% Local Content except following Line items for which Country of Origin and Percentage of Local content is mentioned below :

S. no.	Each tender line item (B)	Country of origin (C)	Percentage of local content (D)
1	Solar Modules		
2	Module Mounting Structure		
3	PCU/Inverter		
4	DC Cables		
5	AC Cables		
6	Evacuation Infrastructure on Plant and S/S side with power evacuation cable		
7	Balance of Supplies		
8	Civil, Mechanical and other associated works as per scope of Work		
9	Plant Installation		

Bidders Signature with stamp

Place:

Date:

SAFETY DECLARATION

I/We hereby declare and confirm that;

1. I/we shall strictly adhere to safety standards stipulated in the Safety Practices during construction stipulated without exception.
2. I/we shall provide, without any exception, safety helmets & safety shoes to all our employees/workmen/labourers working at DLCSUPVA location for the purpose of rendering services to DLCSUPVA under the subject Contract
3. I/ We shall provide, without any exception, Safety Belts to all our workmen/ labourers working at heights (Including building roof top, canopy roof top etc) for the purpose of rendering services to DLCSUPVA under the subject Contract
4. I/We have read and understood the provisions of Clause 16 of the Special Terms & Conditions of Contract regarding safety at worksites.
5. I/We shall be bound to pay a penalty of Rs. 5000/- for every incident of non-provision of safety shoes/ safety helmet/ safety belts occurring during the pendency of the contract.
6. I/We shall take safe height working permit for working at heights.
7. I/We shall be solely responsible for any accident resulting from unsafe practices or due to non-adherence to safety standard. Any injury / loss of life resulting from the above shall be solely at our risk & cost and we shall bear and pay solely and absolutely all costs, charges and expenses including legal charges incurred in this connection.
8. That DLCSUPVA is not bound to be responsible, legally or otherwise, for any acts and/or consequences of unsafe practices during execution of works during the pendency of the contract.
9. The person signing this declaration is the authorized signatory.

Signature:

Name:

Address:

Date:

Annexure-24

**PERFORMA FOR DECLARATION ON NCLT/ NCLAT/ DRT /DRAT /COURT RECEIVERSHIP/
LIQUIDATION) {to submitted in Bid Documents}**

Bidder Name:

I/ We hereby declare that I/We /M/s., declare that :

(i) I / We am/are not undergoing insolvency resolution process or liquidation or bank corrupt proceeding as on date.

Or,

(ii) I / We am/are undergoing insolvency resolution process or liquidation or bankruptcy proceeding as on date as per details mentioned below.

(Attached detail with technical bid)

Note :- Strike out which is not applicable.

It is understood that if this declaration is found to be false, DLCSUPVA shall have the right to reject my/our bid, and forfeit the EMD. If the bid has resulted in a contract, the contract will be liable for termination without prejudice to any other right or remedy (including black listing or Debarring) available to DLCSUPVA.

Place:

Dale:

Signature of Bidder Name of Signatory

GLOSSARY OF TERMS:

A / Amp	Ampere
AC	Alternating Current
ACDB	Alternating Current Distribution Board
ASTM	American Society for Testing and Materials
BG	Bank Guarantee
BIS	Bureau of Indian Standards
BoQ	Bill of Quantity
BSF	Back Surfaced Field
CAD	Computer Aided Drafting
CEIG	Chief Electrical Inspector to Government
CT	Current Transformer
CVT	Capacitor Voltage Transformer
DC	Direct Current
DG	Diesel Generator
DSC	Digital Signature Certificate
DWF	Drawing Web Format
EIC	Engineer In-Charge
EMD	Earnest Money Deposit
ESE	Early Streamer Emission
EPC	Engineering, Procurement and Construction
FLRS	Flame Retardant Low Smoke
FGL	Finished Ground Level
F.O.R.	Freight on Road
FY	Financial Year
G.I.	Galvanized Iron
GCC	General Conditions of Contract
GHI	Global Horizontal Irradiance
GTP	Guaranteed Technical Particulars
HRC	High Rupturing Capacity
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
DLCSUPVA	Dada Lakhmi Chand State University of Performing and Visual Arts
IP	Ingress Protection
IR	Infra Red
Isc	Short Circuit Current
ISO	International Organization for Standardization
ITB	Instructions to Bidders
JV	Joint Venture
km	kilo meter
KV	Kilo Volt

kVA	kilo Volt Ampere
kW	kilo Watt
kWh	kilo Watt hour
kWp	kilo Watt peak
LA	Lightning Arrestor
LoA	Letter of Award
LPS	Lightning Protection System
LSTK	Lumpsum Turnkey
LT	Low Tension
LV	Low Voltage
MCB	Miniature Circuit Breaker
MCCB	Moulded Case Circuit Breaker
MDR	Major District Roads
MMS	Module Mounting Structure
MNRE	Ministry of New and Renewable Energy
MoU	Memorandum of Understanding
MPPT	Maximum Power Point Tracker
MS	Mild Steel
MSME	Micro Small and Medium Enterprises
NEFT	National Electronics Funds Transfer
NH	National Highway
DNIT	Detailed Notice Inviting Tender
NOC	No Objection Certificate
NSIC	National Small Industries Corporation
O&M	Operation and Maintenance
OFC	Optical Fibre Cable
PAN	Permanent Account Number
PCU	Power Conditioning Unit
PDF	Portable Document Format
PERT	Program Evaluation and Review Technique
PG	Performance Guarantee
PID	Potential Induced Degradation
PMC	Project Management Consultant
PO	Purchase Order
PR	Performance Ratio
PT	Potential Transformer
PV	Photo-voltaic
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Check
RAR	Roshal Archive File Format
RCC	Reinforced Cement Concrete

REC	Renewable Energy Certificate
RFID	Radio Frequency Identification
RLDC	Regional Load Dispatch Centre
ROW	Right of Way
RTGS	Real Time Gross Settlement
SCC	Special Conditions of Contract
SH	State Highway
SLDC	State Load Dispatch Centre
SOR	Schedule of Rates
SPD	Surge Protection Device
SPV	Solar Photo-voltaic
SS	Stainless Steel
TIN	Taxpayer Identification Number
UV	Ultra Violet
VCB	Vacuum Circuit Breaker
Voc	Open Circuit Voltage
VT	Voltage Transformer
W	Watt
XLPE	Cross Linked Polyethylene

Chapter – 8 UNPRICED PRICE BID

DO NOT QUOTE PRICE HERE

Schedule of Rates (SOR) - Not to be quoted (online only)

Engineering, Procurement, Construction (EPC) of 400 KWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in Dada Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana).

Sr. No.	Description	Qty	Unit	Quoted Unit Rate including all taxes	Total Amount including all taxes
1.	<p>HSR:- 32.70.3 Supply Installation testing commissioning of Solar Photovoltaic grid connected roof top Plant conforming to MNRE specifications as amended, consisting of Mono Crystalline (N-Type Topcon Bifacial as latest technology) solar cells, net metering facility, necessary protections, earthing, mounted on Aluminium/GI structure of suitable strength with following components complete as required:-</p> <p>(a) Solar Photovoltaic Module manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730-Part-1, IS/IEC 61730-Part2. Solar Photovoltaic Module conversion efficiency shall not be less than 21% (As per latest technology). PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, degradation should be less than 1% at the end of 1st year and 0.4% p.a. from 2nd to 25 years.</p> <p>(b) Power Conditioning Unit (PCU) of 1000 V DC Input voltage range and 400 V AC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC (c) Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degrees</p> <p>(c). The PCU shall adjust the voltage and frequency level to suit grid frequency</p> <p>(d) Data Monitoring System complete with accessories.</p> <p>(e) Fixing of Array junction box & Main junction box with IP 65-68 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required.</p>	400	kWp		

	<p>(f) Lightning and surge voltage protection.</p> <p>(g) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1 kV grade armoured power and control cables between solar modules, main power cable to grid supply PCU unit along with supplying & fixing of necessary channel/conduit lugs and other accessories etc. as required.</p> <p>The above scope of work is indicative only. The work will be carried out complete in all respects as per detailed scope of work, specifications, terms and conditions mentioned in standard bid documents up to entire satisfaction of engineer in-charge.</p>				
2.	<p>NS Item:-supply and fixing of Water Motor Pump 1HP, Single Phase 180-240V, Brass Impeller, Copper winding, Mead 6-32, 59-30LPM Flow Rate, Cast Iron Body, Self-Priming , head 06 to 32 Meter along with all necessary electrical connections with material and sanitary fittings along with necessary material complete in all respect upto entire satisfaction of engineer-in-charge. Make:- Kirloskar , Crompton , CRI, Taxmo, Havell's</p>	05	No.		
3	<p>NS Item:-Supply of hose pipe 13mm, 100% Rubber, all weather flexibility, Polyester Braided Reinforcement, Ozone and UV Resistant, working pressure 10BAR, Burst Pressure 30BAR complete in all respect upto entire satisfaction of engineer-in-charge. Make:- Nosimon, Zephyr</p>	450	Meter		
4	<p>NS Item:- supply and fixing of Heavy-Duty Auto-Retractable Water Hose Reel 18-Guage Steel Construction, Powder Coated Steel to resist corrosion, adjustable outlet arm, ceiling, floor, wall mounting options with 20meter hose pipe 13mm, 100% Rubber, all weather flexibility, Polyester Braided Reinforcement, Ozone and UV Resistant, working pressure 10BAR, Burst Pressure 30BAR upto entire satisfaction of engineer-in-charge Make:- Nosimon, Zephyr</p>	05	No.		

DNIT for Engineering, Procurement, Construction (EPC) of 400 kWp On-Grid Roof Mounted Solar Power Plant on Rooftop of Various Building in DADA Lakhmi Chand State University of Performing and Visual Arts, Rohtak (Haryana)
Approx. Amount: Rs. 1,92,25,377/-
Earnest Money: For Contractor/Agency Rs. 3,84,510/- / For Registered Societies Rs. 1,92,260/-
Time Limit = 04 Months

Sr. No.	Description of Item	Qty.	Unit	Unit Rate to be Quoted (Including GST and all taxes)
1.	<p>HSR:- 32.70.3:- Supply Installation testing commissioning of Solar Photovoltaic grid connected roof top Plant conforming to MNRE specifications as amended, consisting of Mono Crystalline (N-Type Topcon Bifacial as latest technology) solar cells, net metering facility, necessary protections, earthing, mounted on Aluminium/GI structure of suitable strength with following components complete as required:-</p> <p>(a) Solar Photovoltaic Module manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730-Part-1, IS/IEC 61730-Part2. Solar Photovoltaic Module conversion efficiency shall not be less than 21% (As per latest technology). PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, degradation should be less than 1% at the end of 1st year and 0.4% p.a. from 2nd to 25 years.</p> <p>(b) Power Conditioning Unit (PCU) of 1000 V DC Input voltage range and 400 V AC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC (c) Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degrees</p> <p>(c). The PCU shall adjust the voltage and frequency level to suit grid frequency</p> <p>(d) Data Monitoring System complete with accessories.</p> <p>(e) Fixing of Array junction box & Main junction box with IP 65-68 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required.</p> <p>(f) Lightning and surge voltage protection.</p> <p>(g) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1 kV grade armoured power and control cables between solar modules, main power cable to grid supply PCU unit along with supplying & fixing of necessary channel/conduit lugs and other accessories etc. as required.</p> <p>The above scope of work is indicative only. The work will be carried out complete in all respects as per detailed scope of work, specifications, terms and conditions mentioned in standard bid documents up to entire satisfaction of Engineer in-Charge.</p>	400	kWp	
2.	<p>NS Item:- Supply and fixing of Water Motor Pump 1HP, Single Phase 180-240V, Brass Impeller, Copper winding, Mead 6-32, 59-30LPM Flow Rate, Cast Iron Body, Self-Priming , head 06 to 32 Meter along with all necessary electrical connections with material and sanitary fittings along with necessary material complete in all respect upto entire satisfaction of</p>	05	No.	

	engineer-in-charge. Make:- Kirloskar , Crompton , CRI, Taxmo, Havell's			
3.	NS Item:- Supply of hose pipe 13mm, 100% Rubber, all weather flexibility, Polyester Braided Reinforcement, Ozone and UV Resistant, working pressure 10BAR, Burst Pressure 30BAR complete in all respect upto entire satisfaction of Engineer-in-Charge. Make:- Nosimon, Zephyr	450	Meter	
4.	NS Item:- Supply and fixing of Heavy-Duty Auto-Retractable Water Hose Reel 18-Guage Steel Construction, Powder Coated Steel to resist corrosion, adjustable outlet arm, ceiling, floor, wall mounting options with 20meter hose pipe 13mm, 100% Rubber, all weather flexibility, Polyester Braided Reinforcement, Ozone and UV Resistant, working pressure 10BAR, Burst Pressure 30BAR upto entire satisfaction of engineer-in-charge Make: Nosimon, Zephyr	05	No.	

Note:-

1. The contractor/agency shall quote the rates (of all items i.e. HSR item & N.S. Item), including all the taxes, GST etc. complete and no extra amount will be paid on this account. The contractor who does not quote the rates, the tender of that contractor shall be rejected out rightly.
2. Within 21 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Registrar a Performance Security in the shape of Bank Guarantee/ FDR of Nationalized Bank for an amount equivalent to 5% of the Contract price. The performance security will be valid upto Defect liability period + Completion Time Period + 45 Days.
3. Defect liability period will be 24 months after satisfactorily completion of work. However, the product warranty of SPV Module will be 12 years and performance warranty will be 25 years. Warranty of inverter will be 10 years. The contractor has to submit the warranty certificate from OEM for SPV Module and Inverters.
4. The work shall be allotted to the contractor on overall lowest basis.
5. No material shall be supplied by the University.
6. The conditional tender and the tender in variation of the tender documents shall out rightly be rejected.
7. Quantity/amount can be increased or decreased as per site requirement.
8. The contractor/agency who fulfills the requirement of the documents as per technical document sheet, is eligible for purchase/filling the tender.
9. The validity of tender shall be 120 days.
10. There is no exemption of EMD and tender fee for MSME/HEW portal registered agency.
11. Bidders are advised to visit the site of work at DLCSUPVA, Rohtak for assessing the quantum of work, No. of inverters of appropriate capacity, steel structure, cabling etc. before quoting their rates
12. The contractor/agency who fulfills the following technically conditions will be considered as eligible:-

TECHNICAL DOCUMENTS

Sr. no.	Description	Copy Enclosed (Yes/No)
1.	Bidder should be empanelled vendor of MNRE/SECI or must have registration on MNRE/SECI website. The copy of enlistment/empanelment or proof of registration should be attached.	
2.	The minimum annual turnover during the preceding three financial years (i.e. FY 2020-21, 2021-22 and 2022-23) should be at least 2.0 crores. The bidder should attach turnover certificate, audited balance sheet, profit and loss A/c statement duly signed by CA. the documents signed by CA must have registration number of authorized CA and its seal	
3.	The bidder must have executed works of similar nature of following value in last 5 years as on last date of tender: - One Work Order of executed work (80% of estimated value of work)	

Sr. no.	Description	Copy Enclosed (Yes/No)
	<p style="text-align: center;">Or</p> <p>Two Work Orders of executed work (each work order of 50% of estimated value of work)</p> <p style="text-align: center;">Or</p> <p>Three Work Orders of executed work (each work order of 40% of estimated value of work).</p> <p>The work order and completion certificate should be certified/issued by the officer not below the rank of Executive Engineer in case of work done on any govt. department/PSU. Work Orders from Private Parties- Certificate from CA certifying value of work done with TDS certificates/bank statement shall be required as corroborative evidence only.</p>	
4.	Copy of PAN card	
5.	Copy GST Registration Certificate (GSTIN no.)	
6.	Partnership deed or Certificate of Incorporation with Memorandum & Articles of Association	
7.	<p>Power of Attorney (POA) (on non-judicial stamp paper of appropriate value duly notarized):</p> <p>Authority of the person uploading the bids with his DSC, shall be required to be submitted in the bids.</p> <p>Document required shall be as given below.</p> <p>In case of proprietary concern: If the bid is submitted by the proprietor, no POA is required. However, he will have to upload undertaking (on letter head) certifying that he is sole proprietor, as per format given in the tender.</p> <p>In case of company: Certified copy of Board Resolution authorising the person submitting the bid on behalf of the company OR</p> <p>POA and the supporting Board Resolution authorising the person submitting the bid on behalf of the company.</p> <p>In case of Partnership Firm/LLP: POA along with Deed of Partnership/LLP Agreement.</p> <p>In case of Cooperative Society: Copy of resolution passed as per Society Rules authorizing the person submitting the bid on behalf of the Society.</p>	
8.	Affidavit of Non-blacklisting/debar on NJSP not older than one month.	
9.	Undertaking (on letter head) for Acceptance of Tender Terms and Conditions as per format attached separately	
10.	Undertakings and Declarations “Country of Origin and Percentage of Local Content” as per annexure.	
11.	The bidder should have also a valid ISO 9001:2015 Certificate issued from any NABCB accredited certification body in the field of quoted item and copy of valid ISO 9001:2015 Certificate must be attached with offer.	
12.	Submission of online payments i.e. Earnest Money Deposit, Tender Document Fee & e - Service Fee and scanned copies of supporting documents.	
13.	Copy of authority letter from Original Equipment Manufacturer specially for SPV and Inverters. In case bidder is manufacturer of SPV, authority letter from manufacturer of inverter is required.	