TENDR DOCUMENT

NEW & RENEWABLE ENERGY DEVELOPMENT CORPORATION OF AP LTD (NREDCAP)

On behalf of

ACHARYA NAGARJUNA UNIVERSITY

Inviting bids for

DESIGN, ENGINEERING, SUPPLY, INSTALLATION, TESTING & COMMISSIONING, OPERATION & MAINTENANCE FOR A PERIOD OF 10 YEARS OF 2MWp (2 x 1 MWp) GRID BASED ROOFTOP SOLAR PV POWER PLANT IN TWO PHASES OF 1 MWp CAPACITY EACH

AT

Acharya Nagarjuna University, Nagarjuna Nagar, Guntur District

(Ref No: NREDCAP/OSD/NM/ANU-2 MW/42-173/2019 dated 15.02.2019)

Issued by

New & Renewable Energy Development Corporation of AP Ltd
12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam road, Tadepalli, Guntur District
Tel: 0863 -2347650 /651/652/653; E-mail: info@nredcap.in; we@nredcap.in

NAME OF FIRM :……

DISCLAIMER

1. The Tender Bid document is not transferable.
2. This Bid document is issued by New & Renewable Energy Development Corporation of AP Ltd (NREDCAP).
3. The Bid document is not a prospectus or offer on invitation to the public in relation to the sale of shares, debentures or securities, nor shall this bid document or any part of it form the basis of or be relied upon in any way in connection with, any contract relating to any shares, debentures or securities.
4. In considering an investment, if any, in the proposed Project, each recipient should make its own independent assessment and seek its own professional, technical, financial and legal advice.
5. Whilst the information in this Bid document has been prepared in good faith, it is not and does not purport to be comprehensive or to have been independently verified. Neither NREDCAP nor any of their officers or employees, nor any of their advisers nor consultants, accept any liability or responsibility for the accuracy, reasonableness or completeness of, or for any errors, omissions or misstatements, negligent or otherwise, relating to the proposed Project, or makes any representation or warranty, express or implied, with respect to the information contained in this document or on which this document is based or with respect to any written or oral information made or to be made available to any of the recipients or their professional advisers and, so far as permitted by law and except in the case of fraudulent misresentation by the party concerned, and liability therefore is hereby expressly disclaimed.
6. The information contained in this document is selective and is subject to updating, expansion, revision and amendment issued before due date. It does not, and does not purport to, contain all the information that a recipient may require. Neither NREDCAP nor any of their officers, employees nor any of its advisors nor consultants undertakes to provide any recipient with access to any additional information or to update the information in this document or to correct any inaccuracies therein which may become apparent. Each recipient must conduct its own analysis of the information contained in this document or to correct any inaccuracies therein that may contained in this document and is advised to carry out its own investigation into the proposed Project, the legislative and regulatory regime which applies thereto and by and all matters pertinent to the proposed Project and to seek its own professional advice on the legal, financial, regulatory and taxation consequences of entering into any agreement or arrangement relating to the proposed Project.
7. This bid document, if includes certain statements, estimates, projections, designs, targets and forecasts with respect to the Project, such statements, estimates, projections, targets and forecasts, designs reflect various assumptions made by the management, officers and employees of NREDCAP, which assumptions (and the base information on which they are made) may or may not prove to be correct. No representation or warranty is given as to the reasonableness of forecasts or the assumptions on which they may be based and nothing in this document is, or should be relied on as a promise, representation or warranty.

Authorised Person: The VC & Managing Director, NREDCAP
Address: 12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam road, Tadepalli, Guntur District
Tel: 0863 -2347650 /651/652/653
Email: info@nredcap.in; we@nredcap.in;
Place: Tadepalli
Date: 15.02.2019

Information pertaining to Bid submission via e-Procurement platform

1. Issue of Bid document

The detailed terms and conditions for qualification of the Bidders and for Bid submission are indicated in the bid document. All those interested in obtaining the bid document may download from https://tender.apeProcurement.gov.in. Please visithttps://tender.apeprocurement.gov.infor details regarding online submission of the bid document

Bidders are required to procure a Digital Signature Certificate from any Certifying Authorities (CA) in India from the list mentioned in the below URL: https://tender.apeprocurement.gov.in/DigitalCertificate/signature.html.The Digital Signature Certificate is mandatory for participation in e-Procurement. The Bids can be submitted only upon logging-in with the Digital Signature Certificate in the e-Procurement portal.

The bidder would be required to register on the e-Procurement market place www.apeprocurement.gov.in or https://tender.apeprocurement.gov.in and submit their bids online.Offline bids shall not be entertained by the Authorized Representative for the tenders published in the e-Procurement platform.

The bidders shall submit their eligibility and qualification details, Technical bid, Financial bid etc., in the standard formats displayed in e-Procurement web site. The bidders shall upload the scanned copies of all the relevant certificates, documents etc., in support of their eligibility criteria/Technical bids and other certificate/documents in the e-Procurement web site. The bidder shall sign on the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity.

2. Receipt and Opening of Bid:

Bid must be submitted at the website mentioned in the Bid document on or before dt. 13.03.2019 (last date of submission of Bid) 17.00 hours (IST). If it is a public holiday on the last date for submission of the Bid, the submission and the receipt of the Bid shall be on the next working day. The Technical Bid and the Financial Bid shall be opened as per the time schedule given in the Bid document.

The Authorized Representative shall abide by the Government Orders G.O. Ms. No. 174, Dt: 01-09-2008, G.O. Ms. No. 11, Dt: 01-07-2003, G.O. Ms. No.4, Dt: 17-02-2005, G.O. Ms. No. 6, Dt: 28-02-2005, G.O. Ms. No. 6, Dt: 11-1-2005 and G.O. Ms. No. Dt: 30-12-2005, while conducting the e-Procurement process. The Bidders are requested to read these orders available at https://tender.apeprocurement.gov.in.

3. Payment of Transaction Fee:

It is mandatory for all the participant bidders from 1st January 2006 to electronically pay a Non-refundable Transaction fee of INR 10,000 to MD APTS.,

the service provider through "Payment Gateway Service on E-Procurement platform". The Electronic Payment Gateway accepts all Master and Visa Credit Cards issued by any bank and Direct Debit facility/Net Banking of ICICI Bank, HDFC, Axis Bank to facilitate the transaction. This is in compliance as per G.O.Ms. 13 dated 07.05.2006. GST of 18% (or as in force) + Bank Charges for Credit Card Transaction of 2.09% on the transaction amount payable to MD APTS. shall be applicable.

4. Nodal Person for enquiries and clarifications

All correspondence, clarifications in respect of the Bid document and submission of the Bid shall be addressed to:

Designation:	The VC & Managing Director,NREDCAP
Address:	12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam road, Tadepalli, Guntur District
Telephone:	0863 -2347650 /651/652/653
E-mail id:	info@nredcap.in; we@nredcap.in

Sl.No	**Description**	
1	Department Name	New & Renewable Energy Development Corporation of AP Ltd (NREDCAP)
2	Office	The VC & Managing Director, NREDCAP
3	Tender Number	NREDCAP/OSD/NM/ANU-2 MW/42-173/2019 dated 15.02.2019
4	Tender Subject	Design, Engineering, Supply, Installation, Testing & Commissioning, Operation & Maintenance for a period of 10 years of 2MWp (2 x 1 MWp) grid based solar PV power plant in two phases of 1 MWp capacity each under Net Metering basis for captive utilization of power by Acharya Nagarjuna University.
5	Tender Type	Open tender
6	Tender Category	Competitive bidding procurement from Solar P.V. Power developers
7	Definitions and	For the purpose of e-Procurement, the following definitions shall apply

	Interpretations	• Tender Inviting Authority shall mean the same as Authorized Representative. • Tender Documents shall mean the same as the Bid document. • Commercial Bid" or "Price Bid" shall mean the same as the Financial Bid. • Bidders shall also upload a checklist of all documents enclosed under Technical Bid and Financial Bid and format as required under the Bid document. • EMD/Bid Security" shall mean the same as the EMD as per the provisions of this Bid document. • Bidder/Tenderer/Contractor shall mean one and the same.
8	Tender Validity Period	90 Days from the Bid deadline date

9	Bid Security /EMD (INR)	As specified in the Bid document as per the prescribed Format, proposals would need to be accompanied by a Bid security in Indian Rupees for an amount of Rs. 10.00 lakhs and valid **upto 30.09.2019.** The bid security shall be kept valid throughout the Proposal Validity Period including any extensions in the Proposal Validity Period and would be required to be further extended if so required by NREDCAP. Any extension of the validity of the Bid Security as requested by NREDCAP shall be provided by the agency a minimum of seven calendar days prior to the expiry of the validity of the Bid Security, being extended.
10	Bid Security/EMD Payable to	Vice-Chairman & Managing Director, NREDCAP
11	Transaction Fee	Transaction fee: All the participating bidders who submit the bids have to pay an amount of INR 10,000/-&applicable service tax as levied by the Govt. of India on transaction fee through online in favour of MD APTS. The amount payable to the MD, APTS is non refundable Bid Processing Fee: The Tenderer shall pay an amount of INR 1,00,000 plus GST 18% (or as in force) by way of Demand Draft in favour of NREDCAP, payable at Tadepalli. The copy of the DD shall be uploaded and the original DD shall be furnished along with the tender document to NREDCAP.
12	Transaction Fee	Payable to the MD, APTS, Vijayawada, through online payment only.
13	Bid Processing Fee	Payable to VC&MD,NREDCAP, Tadepalli by way of Demand Draft.
14	Bid Document Download Start Date	20.02.2019 from 17.00 Hours
14	Bid Document Download End Date	08.03.2019 upto 11.00 Hours

15	Bid closing date	08.03.2019 before 17.00 Hours for uploading technical Bid and Financial-Bid
16	End date for submission of hard copies of Technical bid (scanned) with supporting documents	11.03.2019 before 15.00 Hours
17	Technical Bid Opening date	11.03.2019, 16.00 Hours
18	Financial Bid Opening date	Will be intimated to the technically qualified bidders in advance by notifying in the website.
19	Place of Tender Opening	12-464/5/1, River Oaks Apartment, CSR Kalyana Mandapam Road, Tadepalli, Guntur District, Andhra Pradesh – 522 501.
20	Contact Officer	The VC & Managing Director,NREDCAP, Tadepalli
21	Address/E-mail id	info@nredcap.in; we@nredcap.in
22	Contact Details/Telephone, Fax	Telephone – 0863 -2347650 /651/652/653
23	Procedure for Bid submission	The Bidder shall submit his response through Bid submission to the tender on e-Procurement platform athttps://tender.apeprocurement.gov.inby following the procedure. The Bidder would be required to register on the e-procurement market placehttps://tender.apeprocurement.gov.inand submit their Bids online. Offline Bids shall not be entertained by the Tender Inviting Authority for the tenders published in e-Procurement platform.
		The Bidders shall submit their eligibility and qualification details, EMD, Technical Bid, Financial Bid etc., in the online standard formats displayed in e-Procurement web site. The Bidders shall upload the scanned copies of all the relevant certificates, documents etc., in support of their eligibility criteria/Technical Bid/EMD and other certificate/documents in the e-Procurement web site.

		The Bidder shall sign on the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity. The Bidder shall upload the entire required documents specific to the Bid document in the e-tender platform duly signing each and every document. The bidder shall invariably submit the hard copies of the Technical bid to the Authorised Representative either personally or through courier or post before the timelines as indicated in this tender document. Non-submission of Technical bid along with relevant documents shall lead to rejection of tender.
24	Registration with e-Procurement platform	For registration and online Bid submission, Bidders may contact Procurement platform. HELP DESK of Vupadhi Techno Services Pvt. Ltd, Flat No:407, 4th Floor, Sreeram's Sneha Avenue,Near aravinda School, Kunchanpalli, Tadepalli Mandal, Guntur district-522501.Phone: 08645-243670/71/72/73/74
		https://tender.apeprocurement.gov.in.
		1. Digital Certificate authentication: The Bidder shall authenticate the bid with his Digital Certificate for submitting the Bid electronically on e-Procurement platform and the Bids not authenticated by Digital Certificate of the Bidder will not be accepted on the e-Procurement platform.
		(OR)
		Any other Registration Authority in India. The City-wise list of RAs is available by clicking the link "Apply for a Class-2 Certificate" under "Enroll"section in the web site: www.tcs-ca.tcs.co.in/mca21/index.jsp"
		2. Hard Copies:
		Bidders shall submit hard copies of EMD and Bid Processing fee to the address mentioned in the respective clause of this Bid document before tender dead line. Bidders shall also upload scanned copies of these **documents**(DD/PO towards processing fee and EMD) as a part of the Qualification criteria of bid on the e-Procurement platform.
		All the Bidders shall invariably upload the scanned copies of DD/BG/PO in e-procurement system and this will be one of the key requirements to consider

		the bid responsive.
		The Authorized Representative will not take any responsibility for any delay in receipt/non-receipt of original, Certificates/Documents from the successful Bidder before the stipulated time. On receipt of documents, the department shall ensure the genuinity of certificates/documents uploaded by the Bidder in e-Procurement system, in support of the qualification criteria before concluding the agreement.
		3. GO. Ms. No. 174 -I&CAD dated: 1-9-2008: i. Deactivation of Bidders: If any successful Bidder fails to submit the original hard copies of uploaded certificates/documents, within stipulated time or if any variation is noticed between the uploaded documents and the hardcopies submitted by the Bidder, the successful Bidder will be suspended from participating in the tenders on e-Procurement platform for a period of 3 years.
		ii. The e-Procurement system would deactivate the user ID of such defaulting Bidder based on the trigger/recommendation by the Authorized Representative in the system.
		iii. Besides this, the Authorised Representative shall invoke all processes of law including criminal prosecution of such defaulting Bidder as an act of extreme deterrence to avoid delays in the Bid process for execution of the development schemes taken up by the NREDCAP. Other conditions as per the Bid document are applicable.
		iv. The Bidder is requested to get a confirmed acknowledgement from the Authorized Representative a proof of Original Hard copies submission to avoid any discrepancy.
		4. Bid document:
		i. The Bidder is requested to download the Bid document and read all the terms and conditions mentioned in the Bid document and seek

		clarification if any from the Authorized Representative. Any offline Bid submission clause in this Bid document could be neglected.
		ii. The Bidder has to keep track of any changes by viewing the Addendum/ Corrigenda issued by the Authrorised Representative on time-to-time basis in the e-procurement platform. The Authorized Representative inviting Bids shall not be responsible for any claims/problems arising out of this.
		5. Bid Submission Acknowledgement: The Bidder shall complete all the processes and steps required for Bid submission. The system will generate an acknowledgement with a unique Bid submission number after completing all the prescribed steps and processes by the Bidder. Users/Bidders may also note that the Bids for which an acknowledgement is not generated by the e-Procurement system are treated as invalid or not saved in the system. Such invalid Bids are not made available to the Authorized Representative for processing the Bids. The NREDCAP, Government of AP and Vupadhi Techno Services Pvt. Ltd are not responsible for incomplete Bid submission by the Bidders/users.
25	Rights reserved with the department	Authorized Representative reserves the right to accept or reject any or all of the tenders received without assigning any reasons thereof.
26	General Terms and Conditions	As per the Bid Documents.
27	Other informati on	Bidders shall contact Vupadhi Techno Services Pvt. Ltd for all queries related to bid submission on the e-Procurement platform. HELP DESK of Vupadhi Techno Services Pvt. Ltd, Flat No:407, 4th Floor, Sreeram's Sneha Avenue,Near aravinda School, Kunchanpalli, Tadepalli Mandal, Guntur district-522501.Phone: 08645-243670/71/72/73/74
28	e-Procurement Conditions	1: We, the undersigned, examined the Conditions of Contract, Specification, Special Conditions of Contract, Basic Parameters of the proposed Scheme and subsequent Addendums for the above mentioned works. We have

		examined, understood and checked these documents and have ascertained that there is no ambiguity in the Procurer's requirements. We accordingly offer to complete the work in conformity with such documents for the price as given in the Financial Bid submitted and attached at the commercial stage. 2: Note: Financial Bid attached at commercial stage will be considered for commercial evaluation. 3: As per the conditions in the folder management, we have extracted the file uploaded and verified the contents of the Zipped files to avoid disqualifications. 4: We have also read the Note in the folder management; the documents attached to the commercial bid stage will be encrypted and stored. Documents uploaded in Common folder and attached to the technical bid stage shall not be encrypted.
29	Uploading	1. Financial Bid shall be uploaded at the commercial stage available on the e-Procurement platform which has an encryption facility. 2. The Bidder SHALL AVOID zipping two versions of the same Financial Bid into a single folder. 3. In case the Authorized Representative finds multiple versions of the same Financial Bid in a single zip folder, such Bids are liable for rejection by the Authorized Representative.

CHAPTER-1

1 Introduction and Background

1.1 Introduction

1.1.1 NREDCAP on behalf of Acharya Nagarjuna University, Nagarjuna Nagar, Guntur district invites competitive Bids for Design, Engineering, Supply, Installation, Testing, Commissioning, Operation & Maintenance for a period of 10 Years of 2 MWp (2 X 1 MWp) Grid based Solar PV Power Plant in Acharya Nagarjuna University campus, Nagarjuna Nagar, Guntur District .

1.1.2 It is proposed to utilize the power generated from 2 MW solar power plant to meet the captive power requirement of Nagarjuna University under Net Metering basis.

1.1.3 The Solar power plant to be selected will be for aggregate capacity of 2 MWp.In the solar power plant, Mono Crystalline silicon modules shall only be used under the project. Only commercially established and operational technologies can be used, to minimize the technology risk and to achieve the timely commissioning of the Projects.

1.1.4 The Rooftop Solar Power Project shall be implemented in two phases of 1 MWp capacity each. On successful completion of Phase I project of 1 MWp capacity, NREDCAP and/or Nagarjuna University will consider to expand the capacity by another 1 MWp capacity in the second phase.

1.1.5 SITE DATA: The Base Line study Report describing the site particulars is attached to this tender document. However, the Bidders should undertake their own detailed study to assess the generation based on the solar radiation at the site. The bidders may contact the University authority Sri. N. Venkateswara Rao, Divisional Engineer for necessary permission to visit the site (Phone: 9441494007)

1.4 BROAD SCOPE OF WORK:

a) Design & Engineering of the solar modules & arrays with associated system comprising of DC system (cables &JBs), inverters, transformation to the required voltage for necessary synchronisation at suitable voltage level, switchgears along with adequate protection and monitoring facilities upto the sychronisation point. Augmentation at the interconnection point, if required if any shall also be a part of the project.

b) Optimum design and engineering of suitable mounting structures for mounting the modules with anti-corrosion feature so as to have minimum maintenance requirements during operational years of the plant.

c) Supply and erection of all the components including structures with necessary packaging & forwarding, transportation, loading, unloading and site-storage required for successful implementation of the project upto the inter connection point.

d) Integrated microprocessor based SCADA with required software & hardware for control& monitoring of SPV plant as per best standards.

e) Design & implementation of scheme with compatible software &hardware for accessing the SCADA data remotely at a location.

f) All associated electrical works required for interfacing at 11 KV line(i.e., transformer, breakers, isolators, LA,HT/LT switchgears, protection systems, cables, metering, bi-directional meter, earthling, etc.,) as per proposed scheme duly approved.

g) Design, supply, erection, commissioning & testing of 11 KV line / cabling & associated equipment for connecting into 11 KV switchyard as per technical specification.

h) All associated civil engineering works like:

   i. Construction of foundation & mounting structures for SPV panels.
   ii. Construction of control room, inverter rooms, miscellaneous facilities including office, toilet etc.
   iii. Arrangement for water supply for module washing.
   iv. The life of the project shall be minimum 25 years after commercial production with degradation in guaranteed efficiency / output not reducing below 90% during the first ten year.
   v. Developing and maintaining necessary infrastructure for site office, electrification arrangements, water supply arrangements,lighting etc.,

i) The work shall include laying of suitable electric lines of desired Voltage with suitable protection and metering yard and suitable transformers as per Indian Electricity Act.

j) The EPC agency shall under take the operation & maintenance with necessary labour, spares, consumables etc., during the operation period of 10 years from the date of commissioning of the project. The operating agency shall procure and use necessary spares, consumable and maintenance tools for trouble free operation including spare parts during the operation period.

k) The operating agency shall Supply, erect and commission step-up transformers and associated electrical works and fencing around the transformers and electric lines up to the metering yard and development of metering yard duly providing tested and accepted metering equipment with required protection as per the approved standards of APSPDCL / Competent authority.

l) The power shall be injected at the existing transformer which is available in the campus and/or by installing required transformer and metering arrangement as per the statutory requirements and guidelines of APSPDCL under net metering policy.

m) The Solar plants installed shall be in conformity with BIS standards and the Ministry of New & Renewable Energy resources guidelines. All necessary approvals/ clearances/ statutory approvals from all the concerned like APSPDCL or any other Govt./ Semi Govt./ Local Authority shall be obtained by the agency at their cost. NREDCAP will extend necessary assistance in obtaining all clearances and approvals to enable the operating agency to perform the work.

n) The operating agency shall operate the solar plants in consonance with the Indian Electricity Act, various Labour laws and regulations of Govt of AP/Govt of India, AP Transco, AP Discoms and NREDCAP.

CHAPTER-2

1 Bid information and instructions to Bidders :

2.1 Obtaining the Bid document:

2.1.1 All those interested in the Bid document can download the Bid document from the website https://tender.e-apeprocurement.gov.in.All information related to submission of response to this Bid document and the Bid shall be available at the aforementioned website

2.1.2 Notwithstanding anything to the contrary contained in this Bid document, the Authorised Representative shall open the Technical Bid of the Bidder, only upon receipt of the above non-refundable processing fee on or before the Bid Deadline.

The Authorised Representative reserves the right to change the above Bid process timelines. However the Authorised Representative shall notify prospective Bidders through email/notification on website/e-Procurement platform regarding changes to the above timelines

2.2 Qualification Requirements

Evaluation of Bids will be based on meeting the financial and technical qualification requirements. Any Bidder who meets the Qualification Requirements stated herein shall be "Qualified Bidder" for the purpose of evaluation under this Bid document.

2.2.1 Eligibility criteria:

(i) BIDDER:

The Bidder should be a Public limited company or Private limited company or Consortium. The company /companies should be registered in India. The term 'Bidder' used hereinafter would therefore apply to both a single Bidder and/ or the Consortium.

The Bid submitted by a Consortium should comply with the following additional requirements failing which shall result in disqualification.

- Number of members in a Consortium should be limited to three (3).
- The Bid should contain the information required for each member of the Consortium
- Each Consortium must nominate a lead member/prime bidder of the Consortium and must submit the Power of Attorney by all members of the Consortium in favour of the lead member/prime bidder.
- Any Company applying as a sole Bidder cannot at the same time be

member of any Consortium applying for this Project. Further, a member of a particular Consortium cannot be member of any other Consortium applying for this Project. Any Bidder who submits or participates in more than one Bid for this Project will be disqualified and will also lead to disqualification of the Consortium of which it is a member.

- Members of the Consortium shall enter into a memorandum of understanding (MoU) specific to this Project which shall be submitted with the Tender document. The MoU shall, inter alia:

  - Convey the intent to form a Consortium, with commitments in accordance with the Tender Document, which would enter into the Project Agreement and subsequently carryout all the responsibilities as Implementing Agency in terms of the Project Agreement, in case the Project is awarded to the Consortium.

  - Clearly outline the proposed roles and responsibilities of each member at each stage.

The members of the Consortium shall be jointly liable for the execution of the Project in accordance with the terms of the tender document; however NREDCAP will interact with lead member who shall own all liability and responsibility on behalf of consortium.

The Consortium as a whole must be a sound entity both technically and financially.

The change in composition of the Consortium (i.e. Insertion or deletion of new/existing members) will not be allowed after the submission of the Bid.

(ii) The company shall be in the field of solar power systems for at least 5 years. In the case of consortium of companies, the lead member shall fulfill this criterion.

(iii) The Company shall be one of the registered empanelled suppliers in category of Grid Connected Solar Rooftop systems with NREDCAP.

(iv) The Company or consortium Group cumulative annual turnover of at least INR 50 crores during the last three (3) financial years ending with March 2018 duly certified by the Charted Accountant/ Audited Accounts.

(v) The company should have designed, supplied, erected, commissioned SPV-based grid connected/ interactive power plants of cumulative installed capacity of 5MWp or above (at one or more projects) during the last five years. Further, the company should have designed, supplied, erected, commissioned of SPV-based grid connected Solar Rooftop power plants of cumulative installed capacity of 5MWp or above (at one or more projects), during last 5 years, with at least one project of minimum 300 KWp capacity at single location. In the case of consortium, the lead member shall fulfill this criterion.

(vi) The company should have installed a minimum 500 KWp capacity Grid / Off grid solar systems in the State of Andhra Pradesh.

(vii) The bidder should have minimum Net Worth of Rs. 10 Cr. The bidder shall have the prescribed Net Worth for the year 2017-18 (or) the bidder shall submit the latest Solvency Certificate of the credit facilities from the bankers for a minimum amount of Rs. 10 crores.

The computation of **Net Worth** shall be based on unconsolidated audited annual accounts of the company. The company would be required to submit annual audited accounts for the financial year 2017-18 along with a certificate from the Chartered Accountant to demonstrate the fulfilment of the criteria.

Net Worth	:	Paid up share capital
Add	:	Reserves
Subtract	:	Revaluation Reserves
Subtract	:	Intangible Assets
Subtract	:	Miscellaneous Expenditures to the extent not written off and carry forward losses.

The bidder shall furnish the relevant documents fulfilling the qualifying criteria along with his bid, otherwise the bid is liable for rejection. Therefore, the bidder is advised to study all terms and conditions of the tender including technical specifications for submitting complete and comprehensive tender. Failure to comply with any of the terms and conditions or instructions of the offer with insufficient particulars which are likely to render fair comparison of tender as a whole impossible may lead to rejection even if otherwise it is a competitive offer/ tender.

(viii) The applicant / its collaborator, as applicable, should have adequate technical expertise in the area of structural design as per applicable codes and standards in solar/ power/ steel/ industries.

(ix) The company/consortium groups should not have been black listed/debarred /disqualified by any Govt. Entity or any International Agency for non-delivery or noncompliance or corrupt/fraudulent practices. The company should give self-declaration to this effect and the onus will be on the applicant.

MEMORANDUM OF UNDERSTANDING OF CONSORTIUM PARTNERS:

Members of the Consortium shall submit a Memorandum of Understanding (MoU) for the purpose of submitting the Proposal. The Memorandum of Understanding (MoU) shall be furnished on a non-judicial stamp paper of Rs. 100/-, duly attested by notary public.
The MoU shall, inter alia:
Convey the intent to form a Special Purpose Vehicle with shareholding commitment(s) explicitly stated.

The MoU shall communicate the willingness of the Consortium to subsequently carry out all the responsibilities as in terms of the Agreement, in case the Project is awarded to the Consortium.

Clearly outline the proposed roles and responsibilities of each member at each stage.

Clearly state those members of the Consortium shall be liable jointly for the execution of the Project in accordance with the terms of the Agreement and a statement to this effect shall be included in the MoU.

Should be accompanied by the Board Resolutions (in case of corporate members) and/or undertakings (in case of individual members) of the Consortium, giving authority/undertaking to enter into an MoU with other members for undertaking the Project and, if successful, to participate and undertake the Project and in case of corporate members nominating and authorizing an authorised representative of the member to sign and enter into the MoU and execute Power of Attorneys for the Project.

Should be accompanied by a certified true copy of the Memorandum and Articles of Association (in case of corporate members) and Sales tax registration number/PAN/TAN/GST.

A copy of the MoU duly notarized, should be submitted along with the Proposal. The MoU entered into among the members of the Consortium should be specific to this Project and should contain the above requirements failing which, the Application shall be rejected as non-responsive. The MoU should be governed by the laws, rules and regulations of India and should be subject to jurisdiction of Indian Courts only.

The Proposal shall be signed by the duly authorized signatory of the Lead Member and shall be legally binding on all the members of the Consortium.

All witnesses and sureties shall be persons of status and probity and their full names, addresses and telephone numbers/mobile numbers shall be stated below their signature. All signatures in the Proposal documents shall be dated.

2.3 Bid Preparation cost

The Bidder shall be responsible for all the costs associated with the preparation of Bid and participation in discussions and attending pre-bid meeting(s), etc. Authorised Representative shall not be responsible in any way for such costs, regardless of the conduct or outcome of the bid process.

2.4.1 Bidders' Responsibilities:

The Bidder is expected to examine carefully, the contents of all the documents provided. Failure to comply with the requirements of bid document will be at the Bidders' own risk. It would be deemed that prior to the submission of the Proposal, the Bidder has:

(i) Made a complete and careful examination of requirements and other information set forth in this document;

(ii) Received all such relevant information as it has requested from NREDCAP and

(iii) Made a complete and careful examination of the various aspects of the Project including but not limited to:

a) The Project site
b) Existing facilities and structures
c) The conditions of the access roads and utilities in the vicinity of the Project Site
d) Conditions affecting transportation, access, disposal, handling and storage of the materials
e) Power evacuation facilities in the neighborhoods for evacuating power .
f) All other matters that might affect the Bidder's performance under the terms of this document
g) NREDCAP shall not be liable for any mistake or error or neglect by the Bidder in respect of the above.
h) Each Bidder shall submit only one Proposal. Submission of more than one Proposal by any Bidder shall be sufficient grounds for disqualification of the Bidder. In case, any entity is part of more

than one Bidder (either a sole Bidder or a Consortium), shall lead to disqualification of all the Bidders in which such an entity is participating.

2.5Amendment of Tender

NREDCAP may modify the bid document by issuing an Addendum before Proposal Due Date.

Any Addendum thus issued shall be part of the bid document and will be published in NREDCAP website www. nredcap.in and also uploaded in e-procurment website.

To give prospective Bidders reasonable time in which to take Addendum into account in preparing their bids, NREDCAP may, at its sole discretion, extend the Proposal Due Date.

Authorised Representative reserves the right to reject any or all of Bids or cancel the Bid process without assigning any reasons whatsoever and without any liability.

2.6 Details of Financial Bid

Bidder shall submit their Financial Bid as per Format of this Bid document.

The bidders shall quote in their proposals a firm lump sum price for the entire scope of supplying and erecting the equipment (covered under the Technical Specification) including maintenance period.

The above lump sum price shall be as on the date of opening of the bid and shall include all taxes and duties like GST and any other taxes/duties, works contract tax, Income Tax, surcharge on Income Tax and other corporate taxes. However, the taxes, duties etc., shall also be indicated.

2.7 **Earnest Money Deposit (EMD)**

Earnest Money Deposit (EMD): Proposals would need to be accompanied by a Bid security in Indian Rupees for an amount of **Rs.10.00 lakhs and valid for a period upto 30.09.2019.** The bid security shall be kept valid throughout the Proposal Validity Period including any extensions in the Proposal Validity Period and would be required to be extended and further extended if so required by NREDCAP.

Any extension of the validity of the Bid Security as requested by NREDCAP shall be provided a minimum of seven calendar days prior to the expiry of the validity of the Bid Security, being extended. When an extension of the Bid Validity Period is requested, Bidders shall not be permitted to change the terms and conditions of their Bids. NREDCAP reserves the right to reject the Proposal submitted by any Bidder who fails to extend the validity of the Bid Security in line with the provisions of this clause.

The Bid Security shall be in the following form:

A DD/ irrevocable Bank Guarantee issued by a Bank in favour of the Vice-Chairman & Managing Director, NREDCAP, as per the format attached. For the purpose of providing Bid Security, the "Bank" shall mean

(i) Any Nationalized Bank.
(ii) Any scheduled Commercial Bank.
(iii) The Bank Guarantee issued by a Cooperative Bank shall not be accepted.

2.8 Forfeiture of Bid Security:

a) The EMD shall be forfeited, if

i. Bidder withdraws the bid before expiry of its validity.

ii. Successful bidder does not accept the order/LOI or fails to enter into a contract agreement within the specified period.

iii. Successful bidder fails to furnish Contract performance security within 30 days, or within the period specified, from the date of issue of P.O/ LOI.

iv. The offer is disqualified for the reasons stated in the bid documents, for example, where the EMD is super-scribed on the tender cover as if it was furnished, but not found within or found insufficient, etc.

b) EMD of the Successful Bidder shall be returned within ten (10) days of receipt of Performance Guarantee.

c) EMD of all Bidders who don't qualify for opening of Financial Bids i.e. who are declared as non-responsive as applicable will be returned within ten (10) days of opening of Financial Bid.

d) The Successful Bidder at the time of issuing of LOI is precluded from withdrawing from the bid process. The Authorized Representative shall forfeit the EMD in the event of such withdrawal.

2.9 Performance Bank Guarantee (PBG):

a) The successful bidder shall furnish within one month from the date of issue of LOI/PO, the contract performance security equal to 10 % of EPC value of purchase order/contract (including Taxes and Duties) for proper fulfillment of the terms and conditions of the contract till full execution of the plant and fulfillment of terms and conditions thereof. The amount of Contract Performance Security shall be forfeited to the extent of financial loss suffered by the Corporation, if supplier fails to execute the order and fulfill its terms and conditions.

b) Contract performance Security shall be furnished in the shape of Demand Draft drawn on any nationalized bank in favour of, NREDCAP payable at Hyderabad or in the form of bank guarantee from any nationalized bank in the prescribed proforma.

c) The Bank guarantee should be valid for a period of two years initially and shall be extended from time to time as per requirement, if any.

d) Contract Performance Security shall be returned to the contractor after two years of successful commercial operation of the solar plant provided,

i. the contractor has fulfilled all contractual obligations,
ii. the contractor has proven the satisfactory performance of the plant as per the terms and conditions set out in the contract,
iii. the contractor has submitted the contract performance security deposit for O&M period set out herein below,
iv. and there is nothing outstanding either against the contract or any other purchase orders/contracts placed by the corporation on the Contractor.

2.10 Contract performance Security – For O&M contract:

a). The successful bidder shall furnish within one month from the date of taking over of the plant after successful commissioning, the contract performance security for O&M, equivalent to 15 % of the net present value of the O&M charges for 10 years payable to the contractor.

The amount of Contract Performance Security shall be forfeited to the extent of financial loss suffered by the University, if supplier fails to operate and maintain the plant properly and fulfil terms and conditions.

b) Contract performance Security shall be furnished in the shape of Demand Draft drawn on any nationalized bank in favour of NREDCAP payable at Tadepalli or

in the form of bank guarantee from any nationalized bank in the prescribed proforma.

c) The Bank guarantee should be valid for a period of ten years initially and shall be extended from time to time as per requirement.

d) Contract Performance Security shall be returned to the contractor after ten years of successful operation & maintenance of the solar plant provided,

i. the contractor has fulfilled all contractual obligations,
ii. the contractor has maintained the plant properly to generate maximum power by the plant as per the terms and conditions set out in the contract,
iii. and there is nothing outstanding either against the contract or any other purchase orders/contracts placed by the corporation on the Contractor.

2.11 Bid Validity period and Extension of Proposal Validity period

The Bidder shall submit its Bid in response to Bid document which shall remain valid up to ninety (90) days from the Bid Deadline ("Bid Validity"). Authorised Representative reserves the right to reject Bid which does not meet the aforementioned validity requirement.

In exceptional circumstances, prior to expiry of the original Proposal Validity Period, NREDCAP may request the Bidders to extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing. NREDCAP reserves the right to reject the Proposal submitted by any Bidder who fails to extend the period of validity of its Proposal in line with the provisions of this clause.

The Bid Validity Period of the Successful Bidder shall be automatically extended till the date on which the Agreement is signed and is in force.

The Bidder shall furnish the Bank Guarantee from any Nationalised/Scheduled Commercial Bank to Authorised Representative of NREDCAP as applicable.

The format of the Bank Guarantees prescribed shall be strictly adhered to and any deviation from the above formats may result in rejection of the EMD/PBG and consequently, the Bid.

The Bank Guarantees have to be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to the place of execution. The Bank Guarantees have to be in the name of the Bidding Company / Lead Member of Bidding Consortium.

All expenditure towards execution of Bank Guarantees such as stamp duty etc. shall be borne by the Bidders.

Before signing of agreement with the Successful Bidder, Authorised Representative will verify the documents furnished by the Bidder at the time of Bid submission and the shareholding of the Project Company along with a copy of complete documentary evidence supported with the original documents. Authorised Representative at this stage may also ask the Bidders to furnish the audited balance sheet of the previous month along with complete Bank Statement starting from Bid submission date till date along with a copy of the documents submitted with ROC which became due during this period. If at this stage it is found that the documents furnished by the Bidders are false / misleading or misrepresented in any way then the relevant provisions contained in this Bid document will be applicable.

Before signing of agreement the Authorised Representative shall check for fulfilment of all obligations of Successful Bidder specified in this Bid document and Authorised Representative shall have the right to forfeit the EMD in case the Successful Bidder does not fulfil any of the obligations.

2.12 Submission of Bid by the Bidder

The Bidder shall send EMD and processing fee in the form of DD/ Bank Guarantee, in original, on or before the Bid Deadline, to the address mentioned below:

The VC & Managing Director, New & Renewable Energy Development Corporation of AP Ltd., 12-464/5/1, /River Oaks Apartments, CSR Kalyana Mandapam Road, Tadepalli, Guntur District, Andhra Pradesh – 522 501.

The Bidder shall submit his response through Bid submission to the Bid document on e-Procurement platform at www.apeprocurement.gov.in by following the procedure given below.

The Bidder would be required to register on the e-procurement market place www.apeprocurement.gov.in or https://tender.apeprocurement.gov.in and submit their Bids online. Offline bids shall not be entertained by the Authorised Representative for this Bid document.

The Bidder shall upload Prequalification Bid, Technical Bid and the Financial Bid on the website. The information pertaining to Technical Bid and the Financial Bid shall be scanned and uploaded by the Bidder as per the formats specified.

The Bidders shall upload the scanned copies of all the relevant certificates, documents etc., in support of their Qualification Requirement and other certificate/documents in the www.apeprocurement.gov.in website. Each format has to be duly signed and stamped by the authorised signatory of the Bidder. The scanned copy of such signed and stamped format shall be uploaded by the Bidder on the website specified.

Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures/pamphlets. Non-adherence to formats and/or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder. The scanned copy of such signed and stamped format shall be uploaded by the Bidder on the website specified.

The Bidder shall furnish documentary evidence in support of meeting Qualification Requirements set forth in the Bid document to the satisfaction of the Authorised Representative.

2.13 Important notes and instructions to Bidders

Wherever information has been sought in specified formats, the Bidders shall fill in the details as per the prescribed formats and shall refrain from any deviations and referring to any other document for providing any information required in the prescribed format.

The Bidders shall be evaluated based on the declarations and/or information and/or documents provided by them in relevant schedules of Bid document. The information and/or documents submitted along with the Bid may be verified before signing of agreement.

If the Bidder/ Member in a Bidding Consortium conceals any material information or makes a wrong statement or misrepresents facts or makes a misleading statement in its Bid, in any manner whatsoever, Authorised Representative reserves the right to reject such Bid and/or cancel the Letter of Intent, if issued and the EMD provided up to that stage shall be encashed. Bidder shall be solely responsible for disqualification based on their declaration in Bid.

If the event specified above is discovered after the Effective Date of the agreement, consequences specified in agreement shall apply.

Bids submitted by the Bidder shall become the property of the Authorised Representative and the Authorised Representative shall have no obligation to return the same to the Bidder. However, the EMDs submitted by

unsuccessful Bidders shall be returned as specified.

All pages of the Bid submitted must be initialled by the person authorised by the board, on behalf of the Bidder.

No change or supplemental information to the Bid will be accepted after the Bid Deadline. The Authorised Representative may, at its sole discretion, ask for additional information/document and/or seek clarifications from a Bidder after the Bid Deadline, inter alia, for the purposes of removal of inconsistencies or infirmities in its Bid. However, no change in the substance of the Quoted Tariff shall be sought or permitted by the Authorised Representative. Delay in submission of additional information and/or documents sought by the Authorised Representative shall make the Bid liable for rejection

All the information should be submitted in English language only.

Bidders shall mention the name of the contact person and complete address of the Bidder in the covering letter.

Bids that are incomplete, which do not substantially meet the requirements prescribed in this Bid document, will be liable for rejection by Authorised Representative. Bids not submitted in the specified formats will be liable for rejection by Authorised Representative. Non submission and/or submission of incomplete data/ information required under the provisions of Bid document shall not be construed as waiver on the part of Authorised Representative of the obligation of the Bidder to furnish the said data/information unless the waiver is in writing.

The Qualified Bidder will be required to continue to maintain compliance with the Qualification Requirements specified in this Bid document throughout the bidding process and till the execution of the agreement. Where the Bidder is relying on affiliate/parent/ultimate parent for qualification, the Bidder shall continue to maintain this financial relationship till the execution of the agreement. Failure to comply with the aforesaid provisions shall make the Bid liable for rejection at any stage.

This Bid document includes statements, which reflect the various assumptions arrived at by the Authorised Representative in order to give a reflection of the current status in the Bid document. These assumptions may not be entirely upon by the Bidders in making their own assessments. This Bid document does not purport to contain all the information each Bidder may require and may not be appropriate for all persons. Each Bidder should conduct its own investigations and analysis and should check the accuracy,

reliability and completeness of the information in this Bid document and obtain independent advice from appropriate sources.
Only Andhra Pradesh Courts shall have exclusive jurisdiction in all matters pertaining to this Bid document.

2.14 Bid evaluation methodology and selection

A. 1st Step – Prequalification (PQ)

B. 2st Step – Technical evaluation

C. 3rd Step – Financial Bid evaluation

2.14.1 1st Step – Prequalification (PQ)

The Bidder shall submit the scanned copies of EMD in a separate folder in htwww.apeprocurement.gov.in platform. The Original of the same shall be submitted to the Authorised Representative before the Bid Deadline.

The Bidder shall submit processing fee and original documents pertaining to EMD as specified. Bids not accompanied by EMD as per the terms of the tender document shall be summarily rejected and no further evaluation will be carried out in respect of such Bids/Bidders.

Any of the following conditions shall cause the Bid to be "Non-responsive":

i. Non submission of EMD in acceptable form/amount along with the bid.

ii. Bids not received by the Bid Deadline.

2.14.2 2nd Step- Technical evaluation

Bids received after the Bid Deadline and Bids submitted without the EMD will be summarily rejected. Subject to above, all the formats, documents and/or information submitted by the Bidder as a part of the Technical Bid, except Financial Bid will be opened and evaluated at this stage.

The Bid submitted by the Bidder shall be scrutinized to establish technical eligibility as per Qualification Requirements of the tender.

Any of the following conditions shall cause the Bid to be "Non-responsive":

(i) Non submission of EMD in acceptable form/amount along with the response to tender.

(ii) Bids not received by the Bid Deadline.

(iii) Bid has been submitted by a Consortium and is not accompanied the Consortium Agreement.

(iv) Any indication of the Quoted amounts in any part of Bid, other than in the Financial Bid

(v) Subject to above, Authorised Representative will examine all the documents submitted by the Bidders and ascertain meeting of eligibility conditions prescribed in the tender. During the examination and evaluation of Bids, Authorised Representative may seek clarifications / additional documents / Rectification of errors / Discrepancies if any in the documents submitted etc. from the Bidders if required to satisfy themselves for meeting the eligibility conditions by the Bidders. Bidders shall be required to respond to any clarifications/additional documents sought by Authorised Representative within the timeline intimated by the Authorised Representative.

(vi) It shall be the responsibility of the Bidder to ensure that all the documents have been successfully uploaded on the eprocurement platform. No reminders in this case shall be sent. It will be the sole responsibility of the Bidders to remove all the discrepancies/infirmities and upload/furnish additional documents as requested by Authorised Representative, to the satisfaction of Authorised Representative. Authorised Representative shall not be responsible for rejection of any Bid on account of the above.

(vii) Bids meeting the Technical eligibility criteria and the Qualification Requirements specified in this tender shall be declared technically responsive and the corresponding Bidder shall be declared as the Qualified Bidders.

2.14.3 3rd Step – Financial Bid Opening and Bid evaluation

The price bids of the bidders meeting the technical eligibility criteria will only be opened and considered for evaluation.

The selection of the successful bidder is based the lowest turnkey EPC price quoted.

NREDCAP considers the following parameters, other than the parameters offered by the bidders for calculating the levellized tariff:

i. Cost of funds : 12.5%
ii. Life of the project : 25 years
iii. Loan repayment period : 12 years
iv. O&M expenditure :

a) The bidder has to quote the O&M charges for 1st year and escalation factor for next 10 years.

b) The 10th year value of O&M charges of the bidder will be escalated @ 5.72% for 11th to 25th year of operation by NREDCAP for evaluation purpose.

v. Discount factor : 10.62%
vi. IDC : 2.8% of EPC value

The bids will be evaluated based on the above parameters and the quoted values of EPC price, O&M charges and its escalation and guaranteed energy of the bidders.

The total EPC price offered by the bidder and NPV of discounted O&M expenses for 25 years O&M and thus arrived value will be considered as the project cost. The project cost and guaranteed energy by the bidder with the financial parameters mentioned above will be utilized for evaluation of levellised tariff and thus the lowest bidder.

A sample calculation sheet is enclosed as ANNEXURE to the bid document for guidance of the bidders.

The lowest tender by itself will not confer any right or will not amount to accept in favour of lowest bidder, as the same is subjected to acceptance by competent authority.

Notwithstanding anything to the contrary contained herein, the Authorised Representative, has the right to reject any or all of the Bids, at any stage during the bid process, if the Quoted amounts are not aligned to the prices at which the University would be willing to execute solar Power Plant after opening of the Financial Bids.

2.14.4 AWARD OF L.O.I AND OTHER PROCESSES:

The successful bidder will be awarded with a Letter of Intent (L.O.I). within 30 days from the issue of LOI, the Bidder would be required to enter into the formal Agreement. The Agreement shall be executed between the Bidder and NREDCAP.

The Authorized Representative reserves the right to change the required capacity without assigning any reasons whatsoever.

After completion of selection of the Successful Bidder as per the process outlined above, Letter of Intent will be sent to the Successful Bidder accompanied by the finalized Financial Bid clearly indicating the finalized Quoted Tariff for the purposes of the agreement.

The Successful Bidder shall unconditionally accept the LoI, and record on one (1) copy of the LoI, "Accepted Unconditionally", under the signature of the authorized signatory of the Successful Bidder and return such copy to the Authorized Representative within seven (7) days of issue of LoI.

2.14.5 Power to Remove Difficulties

If any difficulty arises in giving effect to any provision of the Bid document guidelines or interpretation of the Bid document guidelines or there is a requirement to modify the Bid document guidelines for better implementation, the matter may be considered by the Authorised Representative for this purpose and its decision will be final.

CHAPTER-3

SCOPE OF WORK:

1. Acharya Nagarjuna University desires to take up installation of 2MWp (2 X 1 MWp) Grid Connected Rooftop Solar PV Plants in the building rooftops within Nagarjuana University Campus at Nagarjuna Nagar, Guntur District as per the specification & approval given by NREDCAP to utilize the power generated from the project to meet the captive power requirement of Nagarjuna University under Net Metering basis.

2. Nagarjuna University will permit the agency to set up a Solar Rooftop PV Power Plants on the buildings rooftops .

3. It is intended that work of Commissioning of plant (1st phase) shall be completed within four (4) months from the date of handing over of roofs or date of conclude of agreement whichever is later. The second phase shall be completed within 4 months from the date of issue of clearance by the competent authority.

4. The selected bidder shall Design, Supply, Erection, Testing, Commissioning and Operation for 10 years period of 2 MWp Grid connected Solar Photo Voltaic Plant with seasonal tracking facility system, including evacuation of the power generated at desired voltage level as per the statutory requirement along with facilities for utilization of power under Net Metering basis.

5. Design & implementation of integrated micro processor based SCADA with required software & hardware for control & monitoring of solar plant as per best standards.

6. The bidder shall have the responsibility of obligation to make available the spares, servicing facilities etc., of the equipments for the entire life span of the project i.e., for a period of 25 years from the date of commissioning of the project. The choice of using the services of operating agency or otherwise vests with Nagarjuna University, on completion of 10 years operation period.

7. Necessary metering arrangements and other infrastructure requirements at delivery points shall be in the scope of the bidder to avail the net metering facility as per the policies / regulations / guidelines.

8. The bidder will be permitted to install Solar P.V. Power plant for agreed capacity only in the allotted rooftops. After commissioning the plant, any modification/ alterations/ to the plants/ infrastructure shall be with prior written approval of the competent authority of Nagarjuna University only. No other activities should be allowed to be carried out at the project location by the agency.

9. The bidder shall make his own project cost estimate with the latest technology. Any further expansion over the agreed capacity shall be with the written approval of competent authority NREDCAP/University, as per the terms decided by University / NREDCAP.

10. The developer shall be wholly responsible for arranging transmission access from the station switchyard of the Project up to the Interconnection Point. The Project should be designed for interconnection with the distribution network of APSPDCL at desired voltage level.

11. The interconnection line from Project switchyard to the Location has to be constructed and maintained by the agency at his cost. The entire cost of transmission, construction of lines, metering equipment, losses, supervision charges etc., from the Project up to the Interconnection Point shall be borne by the bidder and shall not be reimbursed by NREDCAP or University.

12. The bidder shall adhere to the "scope of work" as per the offer document submitted. The selected bidder shall maintain the quality and standards as per the offer document. A third party i.e., either the consultant of NREDCAP/University and / or nominee of NREDCAP/University shall have the right to inspect the works while assembling the equipment or shall be permitted to inspect at the Agency's works before dispatch of material to site.

13. The Agency has to prepare / design suitable equipment duly designing the evacuation facilities as per the specification of India Electricity Act/CEA and get the approval of competent authority.

14. The security, watch and ward during the construction period and also during the operation of the plant is the responsibility of the bidder.

15. Supply, erection and commissioning of step-up transformers and associated electrical works, and fencing around the transformer and internal cables up to the metering yard and preparation of metering yard duly providing tested and accepted metering equipment with protections as per the approved standard of APSPDCL / competent authority is the responsibility of the bidder. The bidder as per the standards and approval of APSPDCL shall also undertake the evacuation arrangement at his own cost.

16. The responsibility of obtaining connectivity with the distribution system will lie with the bidder. Delivery of power to the point of inter-connection where the metering is done shall be the responsibility of the bidder at its own cost. The installation of equipment for metering will be the responsibility of the bidder as per the prevailing statutory norms.

17. The bidder at his cost shall obtain all necessary statutory approvals as are necessary and required from APSPDCL, NREDCAP or any other Govt. / Semi Govt. / Local authority for the project. The NREDCAP/University shall render reasonable assistance to the Agency in obtaining all clearances and approvals to enable the agency to perform the work.

18. The Agency shall train Engineers / staff of NREDCAP and University on operation and maintenance at free of cost.

19. The Agency will be permitted to construct some temporary labour camps at work site, which would be kept for a maximum period of four(4) months from the date of commencement of construction and shall also be permitted to construct permanent site office cum storage building for operation and maintenance of the plant at the site as approved by the NREDCA/University. However, the Agency shall take prior approval of University.

20. The Agency, its assignee or any financial institution would have no lien, right to mortgage or any other type of right of title on the project locations provided by the University for the project.

21. The Agency shall designate a representative (who shall normally be project manager) who shall acts as a single point of contract for the operating agency.

22. The Agency and its employees and representatives shall, at all times, abide by the general code of conduct set forth by the University, during their stay at site.

23. The bidders are free to adopt their own technology and quote their rate. They shall furnish the detailed methodology and technical parameters along with the Bid.

24. Safety Measures:
    The Agency shall, in the course of execution of the work, take all necessary precautions for the protection of all persons and property. The Contractor shall take adequate measures to protect the persons from accident during the work / operation of plant including necessary insurances of men, materials, plants etc., as per statutory requirements.

    In the event of any accident to any person or persons or damage or injury of any description to any person or property due to failure on the part of the contractor in taking in proper precautionary measures, the contractor shall be responsible and must make good the loss/ the damage at his own cost to the satisfaction of the department; and the department shall be indemnified from all claims or liabilities arising there from or any expenses incurred on account thereof.

25. (a) Before commencement of work, the agency shall submit work schedule of different events like, i) Construction period, ii) Commission period, iii) Production period.

    (b)The agency shall inform all statutory conditions to be followed; a) during construction stage, b) during operation &maintenance stage. (c) The agency shall furnish the generation and maintenance schedules every year, during peak and non-peak season.

26. The agency has no right to claim the any damages/ claims / Insurance and other incidental charges from NREDCAP or University.

27. The agency has to make their own arrangements for procuring the required water at their own cost. However, in case water is available at the near by point, University will provide water to the extent of availability.

28. The agency has to maintain the premises and surroundings neatly, Hygienic & Tidy at their cost.

29. Construction of accommodation quarters to their staff/ workers at proposed site is strictly prohibited.

30. The Agency has to cut trees as per minimum requirement with prior permission of the University authorities.

31. The Agency can raise funds for the project work from financial agencies / banks. However, the operating agency or its assignee or any financial institution would have no lien, right to mortgage or any other type of right of title on the project locations provided by the University for the project.

32. The Agency shall not encumber, assign or mortgage project assets except for getting finance for execution of the project.

33. The NREDCAP/University render all cooperation and help and to do all acts and deeds as are necessary to the agency for obtaining necessary statutory permissions, approval from Govt. agencies / bodies / departments as are required under various laws, bye-laws, rulings and regulations in force from time to time and give assistance in liaison with various departments and office.

34. The Agency has to maintain the Project in accordance with established Prudent Utility Practices.

35. The Agency has to carry out the operation, maintenance, overhaul of the plant, equipment, works, switch yard and cables and equipment up to the interconnection Point of the Project in coordination with the APSPDCL/University officials.

36. The agency is responsible for all payments on account of any taxes, cess, duties or levies imposed by any government or competent statutory authority on the equipment, material or works of the Project or on the energy generated or consumed by the Project Developer or the Agency or on the income or assets of the Agency.

37. The agency is responsible in obtaining necessary approvals, permits or licenses for operation of the Project and under the provision of the relevant laws.

38. The agency shall comply with the provisions of the Grid Code. Notwithstanding any provision in this Agreement, the Agency shall comply with the state Grid Code, dispatch practices, performance standard, protection & safety as required as per the rules & regulations in force as applicable from time to time in the State of AP.

39. The agency shall obtain necessary approval of APSPDCL in respect of Interconnection Facilities and synchronization of the Project with grid and equipment required to avail net metering facility.

40. The agency shall maintain necessary spares to replace damaged parts in the plant without delay.

41. The Agency shall not dismantle and take away Project machinery and Interconnection Facilities during the Term of the Agreement.

42. Governing Law: All the correspondence shall be in the English language and shall be governed by law of Republic of India.

43. Settlement of disputes:
In case of disputes, the decision of VC & MD, NREDCAP is final and binding.

44. JURISDICTION: For the purpose of this agreement all the transactions shall be deemed to have taken place within the state of ANDHRA PRADESH and the courts in ANDHRA PRADESH shall have jurisdiction over the matters arising under or out of this agreement.

45. Insurance**:** The agency shall obtain necessary insurance coverage for the solar plants at his cost for construction stage and operating period of 10 years. Necessary insurance in respect of work force and third party shall also be obtained and maintained by the agency at his cost.

46. Taxes & Duties

(a) The prices shall be inclusive of all taxes & levies including Service Tax etc.
(b) The taxes quoted should include GST, etc. duties and any other levy attracted to the item applicable from time to time. No extra taxes & duties will be paid apart from the amount quoted.
(c) NREDCAP / University shall be authorized to deduct any tax as applicable from the bidder. Deduction of all statutory and necessary Tax from each bill will be made as per Government Orders prevailing at the time of payment. Necessary tax deduction certificate will be issued on demand by the Company.
(d) All future increase in taxes, duties and levies on energy generated will have tobe borne by the Agency.

47. Assured power generation:

(a) The Agency/Bidder shall indicate the generation guarantee in kWh annually for 2 MW capacity solar power project installed at the interconnection point under this contract. The guaranteed generation has indicated in the financial bid will be considered for evaluation of tenders.

(b) In case of failure to deliver the power guaranteed on annual basis except for reasons contributory to Act of GOD and / or Force majeure, the rate of compensation would be the cost of power per unit purchased by University from APSPDCL for each of unit of power fall short of guaranteed generation.

(c) In case of short fall in generation, the bidder shall pay necessary remedial measures at his cost for achieving the guaranteed generation.

CHAPTER -4

TECHNICAL SPECIFICATION

4.1 Plant requirements and general specification for supply and erection &commissioning:

S.No.	Description		
1.	Capacity of Solar PV plant	:	**2 MWp (2 X 1 MWp) at multiple roofs.**
2.	Type of SPV Module	:	**Mono Crystalline**
3.	Rating of SPV Module	:	**300Wp or higher rating**
4.	Power Conditioning Units (Inverters)	:	**String Inverters (As per site conditions)**
5.	SCADA System	:	**Complete Plant Equipment**
6.	Step up Power Transformers	:	**1.25MVA with 10% over load capacity & secondary voltage rating of 11 kV**
7.	Switchgear	:	**LT & HT**

i. Module Mounting Structures
ii. Junction boxes.
iii. Cables and accessories.
iv. Earthling and Lightning protection.
v. AC and DC Distribution Boards containing LT Switchgear & metering.
vi. Control and protective Relaying Equipment.
vii. 11KV Switchgear i.e., Vacuum Circuit Breaker, CTs, Air Break Isolator, LAs, PTs including Double/Four Pole Structure along with 0.2 class accuracy metering at HT outgoing feeder in control panel.
viii. Control Room for each 1 MWp at specified location.
ix. DC Battery Bank with suitable voltage rating, Battery Charger, DC Distribution Board & UPS System with suitable backup battery for SCADA/HMI.
x. Equipment for continuous measurement of Solar Radiation, ambient temperature, Humidity, DC power, AC power and all other electrical parameters.
xi. SCADA system and the equipment required for online control & performance monitoring of the plant and remote monitoring & control.
xii. Illumination System & internal Wiring for Solar Power Plant.
xiii. Module cleaning system.

xiv. Fire fighting systems.
xv. Comprehensive Maintenance of the equipment including plant insurance, spares & consumables for 10 years from the Date of commissioning.

4.2 The building rooftops required for the project will be provided by University. The bidder is advised to visit the site to acquaint the site conditions, before submission of his bid.

4.4 The bidder shall clearly specify the **guaranteed output (DC Input at PCU and AC output at HV side of the Transformer)**, both minimum and maximum for the site conditions and all other technical parameters, expected electricity generation from the plant, overall performance ratio of the plant, the applicable correction factors/curves, model calculations for performance testing, etc along with their bid. The bidder shall also indicate the estimated generation from the plant month wise and basis for arriving such assessment viz., solar insolation, correction factors, etc. In case of non-submission of the data, it is the discretion of the NREDCAP whether to consider the least values of all the other bids for comparison or total rejection of the bid. NREDCAP will not entertain post-tender correspondence with any bidder.

4.5 a) Total Solar Plant shall be guaranteed for satisfactory performance of 10 Years.

b) Further the bidder shall guarantee the

- Performance of solar P.V. Modules and PCU/inverters as mentioned in detailed Technical specification of the respective components.

- Availability of Spares for 25 Years for PCU from the date of Commissioning of Plant

4.6 The bidder shall provide supporting documents i.e., model test reports, etc for arriving to the stated guaranteed energy at the HV side of the transformer.

4.7 **Technical Parameter of PV Module and various other components for use in Grid Connected Solar Power Plants**

The Solar PV plant must be in conformity with the Ministry of New and Renewable Energy (MNRE) guidelines. The valid type approval is to be provided or otherwise self-certification as per the guidelines of MNRE shall be provided.

Technology Selection: The SPD shall set up Solar PV Plant including the transmission network up to the Interconnection Point, at its own cost and in accordance to the provisions of this Bid document.

The Projects to be selected under this Bid document shall deploy PV Technology . However, the selection of Projects would be technology agnostic within PV technology and crystalline silicon can be installed.

All components of the PV plant shall be in accordance with technical specifications given in relevant BIS/IEC Standards. The design and commissioning also shall be as per latest IEC/BIS standards. The following are some of the technical measures required to ensure quality of the major components used in grid connected solar power Projects.

4.8 PV Module Qualification

1.1 The PV modules used in the grid connected solar power Projects must qualify to the latest edition of any of the following IEC PV module qualification test or equivalent BIS standards.

	IEC
Crystalline Silicon Solar Cell Modules	61215

1.2 In addition, PV modules must qualify to IEC 61730 for safety qualification testing @1000 V DC or higher. The PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701.

4.9 Power Conditioners/ Inverters

The Power Conditioners/Inverters of the SPV power plants conform to the latest edition of IEC/ equivalent BIS Standards as specified below:

Efficiency Measurements	IEC 61683
Environmental Testing	IEC 60068-2
Electromagnetic Compatibility (EMC)	IEC 6500 series-relevant parts
Electrical Safety	IEC 62109-1&2
Protection against Islanding of Grid	IEEE1547/UL1741

4.10 Other Sub-systems/Components

Other subsystems/components used in the SPV power plants (Cables, Connectors, Junction Boxes, Surge Protection Devices, etc.) must also conform to the relevant international/national Standards for Electrical Safety besides that for Quality required for ensuring Expected Service Life and Weather Resistance (IEC Standard for DC cables for PV systems is under development. It is recommended that in the interim, the Cables of 600-1800 Volts DC for outdoor installations

should comply with the draft EN50618 for service life expectancy of 25 years).

4.11 Authorised Test Centres

The PV modules/ Power Conditioners deployed in the power plants shall have valid test certificates for their qualification as per above specified IEC/ BIS Standards by one of the NABL Accredited Test Centres in India. In case of module types/ equipment for which such Test facilities may not exist in India, test certificates from reputed ILAC Member Labs abroad will be acceptable.

4.12 Warranty

PV modules used in grid connected solar power plants must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

4.13 Identification and Traceability

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

a. Name of the manufacturer of PV Module

b. Name of the Manufacturer of Solar cells

c. Month and year of the manufacture (separately for solar cells and module)

d. Country of origin (separately for solar cells and module)

e. I-V curve for the module at Standard Test Condition (1000 W/m^2, AM 1.5, 25^0C)

f. Wattage, Im, Vm and FF for the module

g. Unique Serial No. and Model No. of the module

h. Date and year of obtaining 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 9000

Site owners would be required to maintain accessibility to the list of Module IDs along with the above parametric data for each module.

4.14 Performance Monitoring

All grid Solar PV Power Plants must install necessary equipment to continuously measure solar radiation, ambient temperature, wind speed and other weather parameters and simultaneously measure the generation of DC power as well as AC power generated from the plant. They will be required to submit this data to NREDCAP/University or any other designated agency on line and/or through a report on regular basis every month for the entire duration of agreement. In this regard they shall mandatorily also grant access to NREDCAP/University or any other designated agency to the remote monitoring portal of the power plants on a 24X7 basis.

4.15 Safe Disposal of Solar PV Modules:

The SPD will ensure that all Solar PV modules from their plant after their 'end of life' (when they become defective/ non-operational/ non-repairable) are disposed in accordance with the "e-waste (Management and Handling) Rules, 2011" notified by the Government and as revised and amended from time to time.

The Project shall be designed, engineered and constructed and operated by or on behalf of the Agency with reasonable diligence subject to all applicable Indian laws, rules, regulations and orders having the force of law from time to time;

The Project proposed shall be connected to nearest interconnection point for easy power evacuation, as approved by the APSPDCL, within the time frame stipulated at their cost of the developer.

The Agency shall deploy commercially established technologies for generation of Solar Power.

All future increase in taxes, duties and levies on energy generated will have to be borne by the Solar Power Developer.

The Agency shall own, operate and maintain Interconnection Facilities from Project to grid interfacing point from time to time and necessary expenditure shall have to be borne by the Solar Power Developer.

The Agency shall deploy components/equipment for the STP/SPV complying with approved/minimum technical standards as per International Electro technical Commission ("IEC") & Bureau of Indian Standards ("BIS") or technical standards that are as specified by Ministry of New and Renewable Energy ("MNRE") as

amended from time to time at the cost of the Agency.

4.16 Acceptance/Performance Test

Prior to synchronization of the Project, the contractor shall be required to get the Project certified for the requisite Acceptance/Performance test as may be laid down by CE/APTRANSCO/APSPDCL or an agency identified by APSPDCL/NREDCAP to carry out testing and certification for the Solar Power Projects.

4.17 Verification by NREDCAP/University

The contractor shall be further required to provide entry to the site of the project free of all encumbrances at all times during the Term of the Agreement to NREDCAP and/ or University for inspection and verification of the works being carried out by the Agency at the site of the Project.

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

4.18 Synchronization, Commissioning and Commercial Operation

The Solar Power Developer shall give written advance intimation to the concerned APSPDCL,University and NREDCAP and obtain necessary permissions to synchronize the Project to the grid system.

The synchronization equipment shall be installed by the bidder at its generation facility of the Project at its own cost. The Solar Power project shall be synchronized with the Grid System only after the approval of synchronization scheme is granted by the appropriate authority and checking/verification is made by the concerned authorities.

The bidder shall commission the Project within four (4) Months of the date of issue of Letter of Intent and handing over of site whichever is later, if there are delays penalties will be imposed as per the tender conditions.

CHAPTER-5

5.1 TERMS OF PAYMENT

A. EPC contract:

a) 70% of the purchased value on installation, testing and commissioning of the total system including net metering facility and on handing over of the system to the user organization.

b) 20% payment will be released after 30 days of successful performance and on receipt of performance report from user organization/district office, NREDCAP.

c) Balance 10% of the contract value shall be released at the end of the 5 years on completion of the warranty period and on submission of satisfactory performance report from the user organization or against performance bank guarantee.

B. Operation & Annual Maintenance Charges:

Annual maintenance charges will be paid on pro-rata basis half yearly after completion of satisfactory maintenance of the plant.

NOTE:

1 The payment will be processed only after submission of contractor's commercial invoice along with required documents like test certificates, inspection reports, bank guarantees, etc.

2. Payments shall be made through account payee cheques only.

5.2 Liquidated Damages:

In case the bidder fails to achieve the successful commissioning of the plant within the due date for completion as indicated in these bid documents, then the Corporation shall levy the liquidated damages on the contractor at the rate of 1% (one percent) of the contract price per week of delay or part thereof subject to a maximum of 10% of total contract price. Liquidated Damages so levied will be recovered from the supply /erection bills of the bidder.

5.3 Pre-Commissioning Trails and Initial Operations

The pre-commissioning trails and initial operations of the equipment supplied by the contractor shall be the responsibility of the contractor. The contractor shall provide, in addition, any special instruments/ calibrating devices, etc., if required for the successful performance of these trials.

5.4 Commissioning Report

During trail operations all readings shall be jointly maintained and signed by the Contractor, University and NREDCAP. On successful completion of trail operations, a report shall be jointly prepared and signed indicating results of all the tests / checks and trail operation readings.

5.5 Raising of Invoice / Bills

After completion of works, the contractor shall raise bills / invoices in triplicate along with the delivery challans for arranging release of payment as per the terms of the contract. The bills / invoices shall be certified by the officials of NREDCAP.

5.6 Handing Over

Upon successful completion of erection, testing and commissioning in respect of all equipments under the scope of the specification, the Contractor shall handover the project to University Authorities and a handing over certificate duly counter signed by the official of NREDCAP, as a proof of final acceptance of the equipment shall be submitted. Such certificate shall not unreasonably be held up on account of minor omission or defects, which does not affect the commercial operation or do not constitute any serious risk to the equipment. The contractor shall undertake to make good such omissions and defects at the earliest possible time. The estimated amount as decided by the NREDCAP for making good such omissions or defects or deficiency in observed performance over the assessed or guaranteed performance shall be deducted from the invoice of the contractor and the amount deducted shall be paid as soon as the omissions or defects are rectified or made good the financial loss, etc to the satisfaction of NREDCAP. The handing over certificate however shall not relieve the contractor of his obligation which otherwise survive by the terms and conditions of the contract after issuance of such certificate.

CHAPTER-6

FORCE MAJEURE

6.1 FORCE MAJURE CONDITIONS

i. The supplier shall not be liable for any delay or failure to supply the materials /equipment for reasons of Force Majeure such as Acts of God, Acts of War, Act of Public Enemy, Natural calamities, Fires, Floods, Frost, Strikes, Lockouts etc. Only those causes which have duration of more than 7 days shall be considered for force majeure.

ii. The contractor shall within 10 days from the beginning of such delay notify to the Corporation in writing the cause of delay. The corporation shall verify the facts and grant such extension of time as facts justify.

iii. No price variation shall be allowed during the period of force majeure and liquidated damages would not be levied for this period.

iii. If the performance in whole or part by the contractor or any obligation under the Contract is prevented or delayed by "Force Majeure' conditions for a period exceeding 60 days, the NREDCAP may at his option terminate the contract by notice in writing.

6.2 **Cancellation of Order**:

NREDCAP reserves the right to cancel the contract in part or in full by giving two weeks notice there by, if

- ✓ The bidder fails to comply with any of the terms of the contract.
- ✓ The bidder becomes bankrupt or goes into liquidation.
- ✓ The bidder make general assignment for the benefit of the creditors and
- ✓ Any Receiver is appointed for the property owned by the contractor.

6.3 **Jurisdiction**:

All and any dispute or difference arising out of or touching the contract shall be decided only by the courts or Tribunals situated in AP. State Jurisdiction.

FORMATS OF SECURITIES

PROFORMA

BANK GUARANTEE FOR EARNEST MONEY DEPOSIT

WHEREAS …….. (Name of the Contractor) (here in after called "the Tenderer") has submitted his tender response to NIT No……. dated:…… for the work " …… ……..." (Name of work) (hereinafter called "the tender").

KNOWN ALL MEN by these present that we ……..…… ……. (Name and Address of Bank) ……. (hereinafter called "the Bank" are bound unto …… / (Vice-Chairman & Managing Director, NREDCAP, Tadepalli,Guntur District) in the sum of * …… …….. for which payment will and truly to be made to the said Department, the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the Bank this …….. day of ……..200……

THE CONDITIONS of this obligation are:-

(1) If after Tender opening the tenderer withdraws or modifies his Bid during the period of bid validity specified in the Form of Tender.

(2) If the Tenderer having been notified of the acceptance of his bid by the Department during the period of validity.
   (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Tenderers, if required; or
   (b) fails or refuses to furnish the performance Security in accordance with the instructions of Tenderers.

We undertake to pay to the Department up to the above amount upon receipt of his first written demand, without the Department having to substantiate his demand, provided that in his demand the Department will note the amount claimed by him is due to him owning to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date** …… after the dead line for submission of Tenders as such deadline is stated in the Instructions to Tenders or as it may be extended by the Department,

notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE……. SIGNATURE OF THE BANK ……..

WITNESS…….. SEAL……..

(Signature, Name and Address)

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* The Tenderer should insert the amount of the EMD in words and figures denominated in Indian Rupee. This figure should be the same as shown in the NIT.

** 6 months for the deadline date for submission of Tender. Date should be inserted by the Department before the Tender documents are issued.

Format for Performance Bank Guarantee

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

In consideration of the ----- [*Insert name of the Bidder*] (hereinafter referred to as selected Agency) submitting the response to Bid document inter alia for selection of the agency for Design, Supply, Erection, Testing, Commissioning and operation of 2 MWp (2 X 1 MWp) Grid connected solar power plant at acharya Nagarjuna University, Nagarjuna Nagar, Guntur District, Andhra Pradesh, in response to the Bid document dated…… issued by NREDCAP (hereinafter referred to as Authorised Representative) having its Registered Office at Tadepalli, Guntur district,Andhra Pradesh and Authorised Representative considering such response to the Bid document of ……[*insert the name of the selected Agency*] (which expression shall unless repugnant to the context or meaning thereof include its executers, administrators, successors and assignees) and the Agency and issuing Letter of Intent No ------- to (*Insert Name of selected Agency*) as per terms of Bid document and the same having been accepted by the selected agency.

As per the terms of the Bid document, the _____ *[insert name & address of bank*] hereby agrees unequivocally, irrevocably and unconditionally to pay to the NREDCAP, Tadepalli, Guntur district forthwith on demand in writing from Vice-Chairman & Managing Director, NREDCAP or any Officer authorised by it in this behalf, any amount upto and not exceeding Rupees ----- [*Total Value*] only, on behalf of M/s _____ [*Insert name of the selected Agency / Project Company*]

This guarantee shall be valid and binding on this Bank up to and including…….. and shall not be terminable by notice or any change in the constitution of the Bank or the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our Guarantee shall remain in force until…….[*Insert date corresponding to the Bid document*] shall be entitled to invoke this Guarantee till ……[*Insert date corresponding to thirty (30) days after the validity of the Performance Bank Guarantee.*

The Guarantor Bank hereby agrees and acknowledges that …….[*Insert name of the NREDCAP with which Agreement will be signed*] shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by ……., made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to …… The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by ----------[*Insert name of the selected Agency / Project Company as applicable*] and/or any other person. The Guarantor Bank shall not require [*Insert name of the NREDCAP with which Agreement will be signed*], to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against

…….[*Insert name of the NREDCAP with which Agreement will be signed*] in respect of any payment made hereunder

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Andhra Pradesh shall have exclusive jurisdiction.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.
This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and Accordingly,

NREDCAP shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against the selected Agency / Project Company, to make any claim against or any demand on the selected Agency / Project Company or to give any notice to the selected Agency / Project Company or to enforce any security held by NREDCAP or to exercise, levy or enforce any distress, diligence or other process against the selected Agency / Project Company .

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to NREDCAP and may be assigned, in whole or in part, (whether absolutely or by way of security) by NREDCAP to any entity to whom NREDCAP is entitled to assign its rights and obligations under the Agreement.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. _____ (Rs. _____ only) and it shall remain in force until ……..

…….[*Insert date corresponding to the Bid document*]. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if …….[*Insert name of the NREDCAP with which Agreement will be signed*]

serves upon us a written claim or demand.

Signature _____
Name _____ , Power of Attorney No. _____

For
_____[Insert Name of the Bank]_____, Banker's Stamp and Full Address.

Dated this ____ day of _____ , 20__
Witness:

1. …….

Signature
Name and Address
2. ……..

Signature
Name and Address

Notes:

1. The Stamp Paper should be in the name of the Executing Bank and of appropriate value.

2. The Performance Bank Guarantee shall be executed by any of the Bank from the List of Banks enclosed.

FINANCIAL BID

NIT No: NREDCAP/OSD/NM/ANU-2 MW/42-173/2019 dated 15.02.2019

Name of Work: Design, Supply, Erection, Testing, Commissioning and Operation for 10 years period of 2 MWp (2 X 1 MWp) Grid connected Rooftop Solar Photo Voltaic Plants on the Rootops of buildings in Acharya Nagarjuna University, Nagarjuna Nagar, Guntur District under Net Metering basis for captive utilization of power

We declare that following are our prices for "Design, Supply, Erection, Testing, Commissioning and Operation for 10 years period of 2 MWp (2 X 1 MWp) Grid connected Rooftop Solar Photo Voltaic Plants on the rooftops of buildings in Acharya Nagarjuna University, Nagarjuna Nagar, Guntur District under Net Metering basis for captive utilization of power by the University as per the bid document along with grid connecting equipment and associated Civil works on EPC Basis. These prices are for the entire scope of work as indicated in the tender document, terms and conditions mentioned in Bid Documents.

EPC:

Sl. No.	Item Description	Rates in Rupees	
		For 1 MWp Capacity	For 2 MWp capacity (2 X 1 MWp)
1.	Ex-works Price including GST		
2.	Packing and forwarding charges including GST		
3.	Transit and Storage cum Erection insurance charges inclusive of GST		
4.	Third party inspection charges inclusive of GST		
5.	Freight charges inclusive of GST		
6.	Installation & commissioning Charges inclusive of GST		
7.	Any other Taxes and duties		
8.	Total (in Figures)		
10	Total (in Words)		

O&M:

Sl. No.	Item Description	Rates in Rupees	
		For 1 MWp Capacity	For 2 MWp capacity (2 X 1 MWp)
1.	O&M Charges for 1st Year including GST		
2,	Yearly escalation required on O&M charges.	…….%	……. %

Sl. No.	Item Description	Guaranteed Energy (MU) for 2 MW capacity	
		In Figures	In Words
1	Energy guaranteed in the 1st year (per year/MW of installation)		

Signature of the Bidder with Seal

Certified that:

1. Above rates are in accordance with specifications of various terms & conditions mentioned in the tender document.
2. In the event of any discrepancy between the values entered in figures and in words, the values entered in words shall be considered.
3. The Tax particulars shall be indicated in a separate sheet for each item

Authorised Signature:

Name:

Designation:
Name & Address of the Company/Consortium

TECHNICAL BID

STATEMENT – I

Details of year wise Turnover of the company or group of the companies in the case of consortium during the last three (3) financial years by the Tenderer from 2015-16 to 2017-18.

Sl. No.	Financial Year	Value in Rs.
1.		
2.		
3.		

a) Attach certificate from Chartered Accountant supported with Annual Balance Sheet tallying with I.T. Clearance certificate.

b) Net worth certificate from Chartered Accountant shall also be attached.

Signature of the Tenderer

STATEMENT – II

Details of solar power plants designed, supplied, erected, commissioned grid connected / interactive Solar PV power plant executed by the Tenderer during the last five financial years from 2013-14 to 2017-18.

Sl. No	Name of the work	Capacity (MW)	Client details	Agreement No. & dated.	Value of Contract	Stipulated period of completion	Actual date of completion	Total value of work done.
1	2	3	4	5	6	7	8	9

Please give year wise financial breakup of each project. Also attach certificates issued by the competent authority as a proof of the above.

Signature of the Tenderer

STATEMENT – III

Supporting details of having designed, supplied, erected, commissioned of SPV-based grid connected Solar Rooftop power plants of cumulative installed capacity of 5MWp or above (at one or more projects), during last 5 years from 2013-14 to 2017-18, with at least one project of minimum 300 KWp capacity at single location.

Sl. No	Name of the work	Capacity (KWp / MWp)	Client details	Agreement No. & dated.	Value of Contract	Stipulated period of completion	Actual date of completion	Total value of work done.
1	2	3	4	5	6	7	8	9

Please attach certificates issued by the competent authority as a proof of the above.

Signature of the Tenderer

STATEMENT – IV

Supporting details of having designed, supplied, erected, commissioned of SPV-based grid / Off grid Solar power plants of cumulative installed capacity 500 KWp or above (at one or more projects), with in the State of Andhra Pradesh.

Sl. No	Name of the work	Capacity (KWp)	Client details	Agreement No. & dated.	Value of Contract	Stipulated period of completion	Actual date of completion	Total value of work done.
1	2	3	4	5	6	7	8	9

Please attach certificates issued by the competent authority as a proof of the above.

Signature of the Tenderer

STATEMENT – V

Availability of Key Personnel

Qualification and experience of Key Personnel proposed to be deployed for execution of the Contract.

Sl. No	Name	Designation	Qualification	Total Experience	Working with the Tenderer since.
1	2	3	4	5	6

Signature of the Tenderer

STATEMENT - VI

Information on litigation history in which Tenderer is the Petitioner.

S. No	Case No. / Year	Court where filed.	Subject Matter / Prayer in the case.	Respondents i.e., SE / CE	Present Stage.
1	2	3	4	5	6

Signature of the Tenderer

STATEMENT – VII

DECLARATION

I / WE ……. have gone through carefully all the Tender conditions and solemnly declare that I / we will abide by any penal action such as disqualification or black listing or determination of contract or any other action deemed fit, taken by, the Department against us, if it is found that the statements, documents, certificates produced by us are false / fabricated.

I / WE hereby declare that, I / WE have not been blacklisted / debarred / Suspended / demoted in any department in Andhra Pradesh or in any State due to any reasons.

Signature of the Tenderer

CHECK LIST

S.No	Description	Submitted	Page No
1	2	3	
(a)	Name of the Applicant:	Uploaded online	
(b)	Full address (Registered Office) with Phone/ Fax/ Email	Uploaded online	
(c)	Head office (if different from Regd. Office)with Phone/ Fax/ Email details	Uploaded online	
(d)	Name of the contact person with designation and Phone/ Fax/ Mobile No/ Email	Uploaded online	
(e)	Type of the organization : (Public Sector/Limited/Private Limited Partnership/Proprietary /Society/Others.)	Uploaded online	
(f)	In case of Consortium submit Memorandum of Understanding (MoU) on a non-judicial stamp paper of Rs.100/- duly attested by a notary public.	Uploaded online	
(g)	Chief of the organization (s)	Uploaded online	
(h)	Registration details Registration certificate with MOCA/ Memorandum of articles of association	Uploaded online	
2	PAN No (Enclose copy of the certificates)	Uploaded online	
3	GST registration Certificate	Uploaded online	
4	Service Tax, EPF & GST Registration (Enclose certificates)	Uploaded online	
5	Activities of the Company – Enclose Company profile/ Brochures etc	Uploaded online	
6	Documents for meeting the qualification criteria (Experience, Financial and NREDCAP empanelment particulars, capacity installed in AP State)	Uploaded online	

7	Bid Processing Fee of Rs.1,00,000 by way of DD		
8	Documentary Proof that they are in Solar plants field for past 5 years.	Uploaded online	
9	EMD for Rs. 10.00 lakhs in favour of VC & Managing Director, NREDCAP, Tadepalli by way of DD / Bank Guarantee in any Nationalized / Scheduled Banks of Govt	Uploaded online	
10	Statement-I : – Details of Annual turnover of the company or consortium, during last three (3) financial years shall not be less than Rs.50.00 Crore (i.e., 2015-16 to 2017-18) along with net worth certificate	Uploaded online	
11	Statement-II :- Documentary proof for Designed, supplied, erected, commissioned Solar PV Power Plants of cumulative installed capacity of 5 MW or above, during last 5 years. (i.e., 2013-14 to 2017-18). Please furnish the details of installations (Name of the clients, contact person, address in Telephone No. Title of the Project, Cost of the Project, Duration of the Project, Technology used, Project synchronisation certificates etc.,)	Uploaded online	
12	Statement-III:- Documentary proof for Designed, supplied, erected, commissioned Grid connected Rooftop Solar PV Power Plants of cumulative installed capacity of 5 MW or above (at one or more projects), during last 5 years (i.e., 2013-14 to 2017-18), with at least one project of minimum 300 KWp capacity at single location. Please furnish the details of installations (Name of the clients, contact person, address in Telephone No. Title of the Project, Cost of the Project, Duration of the Project, Technology used, Project synchronisation certificates etc.,)	Uploaded online	
13	Statement –IV - SPV-based grid / Off grid Solar power plants of cumulative installed capacity 500 KWp or above (at one or more projects), with in the State of Andhra Pradesh.		
14	Statement – V :- Details of key personnel available	Uploaded online	
15	Statement – VI :- Details of information on litigation history in which Tenderer is the Petitioner	Uploaded online	
16	Statement – VII :- Declaration	Uploaded online	

17	The bidder should scan / furnish the detailed technical brochures, certifications etc., for the technology proposed to be adopted by him.	Uploaded online	
18	Proposed Technology: Detailed methodology, proposed technology shall be provided. Details of No. of Solar PV Plant etc., shall be furnished	Uploaded online	
19	Any other information the applicant wants to furnish	Uploaded online	

Note:-

a. In the case of consortium, the details of the all the group members shall be furnished.

b. All the pages of the document, enclosures shall be signed by the Bidder.

BASE LINE STUDY REPORT

NOTE**:** The Bidders should undertake their own detailed site study to assess the generation based on the solar radiation at the site

I. SOLAR PV PROJECT SITE EVALUATION

a) Site Location Details

The proposed site is located at in the northern part of Guntur city and well connected by rail and road. Acharya Nagarjuna University is sited in Chennai- Kolkata National Highway, 22 kms from Vijayawada Railway Station and 39 kms from Vijayawada Airport. The university campus area having excellent infrastructure and on-campus facilities of total 50 buildings spread across along with Auditoriums, Hostels, and Play fields which was marked in figure 1 below.

Figure 1 ANU Site Location (Proposed 2 MWp Solar rooftop)

The PV Plant is to be installed on rooftops of various buildings of the institute which was scattered in across and each building name, location, internal distribution transformers and connected substation locations are shown in APPENDIX A.

We have shown in the figure 1 about the main substation location having metering points at HT level (11 KV) and area of two control rooms for stepping up of power through transformers and transmitted via overhead/underground cables to synchronize the solar power with the grid.

The following table [1] which describes the site location and concerned connected substation of APSPDCL details.

Table 1 :ANU Site Details

Site Name	**Acharya Nagarjuna University**
Address	NH-16, Nagarjuna Nagar, Guntur, Andhra Pradesh-522510
Latitude & Longitude	16.374 °N, 80.525 °E
No. of Existing Buildings/Blocks	50
Evaluated Buildings	45
Type of Roofs	RCC Roof
Name of Substation	33/11 KV Nambur S/S
Transformer Exists	5 MVA- 2 Nos
S/S Maintained by	Andhra Pradesh Southern Power Distribution Company Ltd (APSPDCL)

The following 45 buildings are identified and measured to find out suitable for solar PV power plant installations and shown in table [2] along with total roof area of each building (including constructed rooms, water tanks, trees etc.) connected load, type of load and operational time of load. The total available roof area before considering shadow effects of trees, staircase roofs and water tanks is 58,267 m^2.

Table 2 ANU Buildings Roof and Load Details

S. No.	Name of the Building	Latitude	Longitude	Any Shadow Exists	Total Roof Area (m^2)	Total Connected Load (kW)	Type of Load	Time of Operation
1	Administrative Building	16°22'27.19"N	80°31'36.05"E	Water Tanks	1059	100	53 Tons Central AC, 10 Tons Individual	Day
2	Amaravati Hostel	16°22'55.71"N	80°31'56.70"E	Water Tanks	805	50	Fans & Lighting Loads	Night

3	Andhra Bank	16°22'37.09"N	80°31'33.28"E	Water Tanks	564	100	AC & Lighting Loads	Day
4	Animal House	16°22'39.10"N	80°31'51.25"E	Trees	500	15	Fans & Lighting Loads	Day
5	Architectural College	16°22'39.10"N	80°31'51.25"E	Trees	500	40	Fans & Lighting Loads	Day
6	Arts Block-I	16°22'39.01"N	80°31'44.21"E	Trees, Rooms	1715	60	AC & Lighting Loads	Day
7	Arts Block-II	16°22'41.47"N	80°31'38.25"E	Trees, Rooms	1703	60	AC & Lighting Loads	Day
8	Arts & Science Principle Office	16°22'27.32"N	80°31'42.61"E	Trees, staircase roofs	562	30	AC & Lighting Loads	Day
9	Ashoka Hostel	16°22'55.06"N	80°32'0.20"E	Water Tanks	1000	50	Fans & Lighting Loads	Night
10	Auditorium	16°22'38.76"N	80°31'34.61"E	Shadow Free	830	50	170 Tons of AC & 30 kW Lighting Load	Day
11	B. Tech Boys Hostel	16°22'17.89"N	80°31'38.61"E	Water Tanks	4350	55	Fans & Lighting Loads	Night
12	Dept of Bio-Technology	16°22'39.18"N	80°31'37.45"E	Trees, staircase roofs	400	100	Laboratories	Day
13	Canteen	16°22'44.79"N	80°31'41.29"E	Shadow Free	400	15	Fans & Lighting Loads	Day & Night
14	Center for Distance Education	16°22'33.90"N	80°31'27.79"E	Trees, staircase roofs	4685	100	AC & Lighting Loads	Day
15	Central Block	16°22'22.89"N	80°31'37.51"E	Water Tanks	2775	60	AC & Lighting Loads	Day

16	Civil and Mechanical Block	16°22'27.57"N	80°31'32.59"E	Water Tanks	5730	100	Laboratories	Day
17	Computer Bhavan	16°22'39.82"N	80°31'38.61"E	Trees	461	50	Computers, AC, Lighting Loads	Day
18	Dept of Chemistry	16°22'36.99"N	80°31'46.07"E	Trees	551	40	Laboratories	Day
19	Dept of Nano Technology	16°22'29.35"N	80°31'43.07"E	Trees	540	30	AC & Lighting Loads	Day
20	Dept of Statistics	16°22'37.26"N	80°31'37.26"E	Trees, Tower	1907	60	AC & Lighting Loads	Day
21	DMC Building	16°22'36.73"N	80°31'54.36"E	Trees	425	30	AC & Lighting Loads	Day
22	Fitness Centre	16°22'50.49"N	80°31'42.81"E	Trees	300	15	Fans & Lighting Loads	Night
23	Guest House	16°22'35.28"N	80°31'21.85"E	Water Tanks	1520	70	Air Conditioners	Day & Night
24	HRM Bhavan	16°22'31.61"N	80°31'43.96"E	Trees, Water Tanks	300	30	AC & Lighting Loads	Day
25	Indoor Stadium	16°22'49.68"N	80°31'43.64"E	Shadow Free	500	60	Flood Lights 40 kW	Night
26	International Students Hostel	16°22'23.68"N	80°31'43.94"E	Water Tanks	2768	50	AC & Lighting Loads	Night
27	Jainism Building	16°22'38.07"N	80°31'54.57"E	Trees	551	30	AC & Lighting Loads	Day
28	Library	16°22'39.10"N	80°31'51.25"E	Trees, Rooms	300	70	AC & Lighting Loads	Day & Night
29	Mechanical Workshop	16°22'24.99"N	80°31'31.82"E	Water Tanks	1577	40	lathe machines, Immersion	Day

							Machines	
30	NDRF	16°22'39.10"N	80°31'51.25"E	Trees	300	30	Fans & Lighting Loads	Day
31	NID & EEE Block	16°22'23.65"N	80°31'34.65"E	Water Tanks	4669	100	Machines and Motors etc.	Day
32	NSS Building	16°22'39.10"N	80°31'51.25"E	Trees	300	15	Fans & Lighting Loads	Day
33	Pariksha Bhavan	16°22'35.40"N	80°31'49.18"E	Staircase Roofs	2437	70	AC & Lighting Loads	Day
34	Pharmacy & Technology Bhavan	16°22'30.90"N	80°31'50.54"E	Staircase Roofs	2686	120	Laboratories	Day
35	Power House	16°22'28.46"N	80°31'38.90"E	Water Tank	250	5	Fans & Lighting Loads	Day
36	Rural Development Block	16°22'39.05"N	80°31'55.21"E	Trees	170	30	AC & Lighting Loads	Day
37	Satavahana Hostel	16°22'52.99"N	80°31'55.91"E	Water Tanks	500	55	Fans & Lighting Loads	Night
38	Scholars Hostel	16°22'49.07"N	80°31'54.14"E	Water Tanks	600	50	Fans & Lighting Loads	Night
39	Sports Hostel	16°22'54.33"N	80°31'52.92"E	Water Tanks	800	60	Fans & Lighting Loads	Night
40	Students Center	16°22'44.79"N	80°31'41.29"E	Trees	400	30	Fans & Lighting Loads	Day
41	Univ Ladies Hostel-I	16°22'29.75"N	80°31'26.81"E	Trees	759	50	Fans & Lighting Loads	Night

42	Univ Ladies Hostel-II	16°22'26.64"N	80°31'25.76"E	Trees	1339	50	Fans & Lighting Loads	Night
43	Vanijya Bhavan	16°22'34.24"N	80°31'44.55"E	Water Tank	2146	35	AC & Lighting Loads	Day
44	Vice Chancellor Bhavan	16°22'32.32"N	80°31'32.20"E	Staircase Roofs, Rooms	1333	60	AC & Lighting Loads	Day
45	Vikas Bhavan	16°22'44.79"N	80°31'41.29"E	Trees	300	30	Fans & Lighting Loads	Day

Note: The total 25 number of buildings were self-sufficient for designing and implementing of 2 MWp grid interactive solar PV power plant which includes Academic Buildings, Laboratories, Office Buildings and Hostels. Most of the hostels are not considered because of having access by students on roofs.

Complete evaluation of buildings is measured and analyzed the shadow effects of each building and chosen the shadow free area to design the solar PV plant on roofs which were shown in Appendix B.

b) Existing Electrical Infrastructure Particulars

ANU receives two separate 11 KV feeders (ANU Feeder & KAZA Industrial Feeder) which supplies from the 33/11 KV Numbur Substation having 2 Nos of 5 MVA Step down transformers maintained by Andhra Pradesh Southern Power Distribution Company Ltd (APSPDCL). The site is having load with contract demand of 800 KVA and 300 KVA on ANU Feeder Service No GNT769 and KAZA Industrial Feeder Service No GNT3920 respectively.

In the Internal LT Distribution system of the university, one 11 KV ANU Feeder has metering point at substation and connected to six internal distribution transformers with the total capacities of 1930 KVA and another 11 KV KAZA Industrial Feeder has metering position near Indoor Stadium which is supplying to four distribution transformers with the total capacities of 910 KVA listed in the table [3]. The 11KV power line stepped down to 415 Volts with the help of step-down transformers and distributed through different Power Houses to various building loads.

Table 3 ANU Electrical details

Service No	GNT769	GNT 3920
Name of 11 KV Feeder	11 KV ANU Feeder	11 KV KAZA Industrial Feeder
Category	HT - Cat-IIA	HT - Cat-IIA
No. of S/S Transformers	5 MVA	5 MVA
Current Carrying Limit	150 A	150A
Total DTR Capacity in KVA	Ladies Hostel 250 KVA + Power House (250 KVA & 100 KVA) + ISH 350 KVA + Arts Block 160 & 160 KVA + Auditorium 160 KVA + SBI 500 KVA = 1930 KVA	Indoor Stadium 500 KVA + Canteen 160 KVA + Boys Hostel 250 KVA = 910 KVA
Contract Demand	800 KVA	300 KVA
Max Load reached on feeder	40 A	110 A
Diesel Generators	2 Nos 250 KVA & 125 KVA	2 Nos 500 KVA & 750 KVA
Type and Size of Conductor	AAAC & 55 Sq.mm	AAAC & 55 Sq.mm
Avg Electricity Bills per Month in ₹	196420	92746
Total annual consumption in ₹	2357043	1112958
No of Buildings	25	20
The proposed Solar PV Capacity	1000 kWp	1000 kWp

The ANU feeder has more than 25 buildings are connected and having spacious roofs are available to set up solar PV power Plants. The KAZA Feeder has 20 buildings connected which consists of hostels, play fields and pump sets. The campus is having new constructions which leading to higher electricity consumption and demand in near future.

Currently ANU feeder has annual electricity consumption of 23 Lac Units and monthly average consumption of 2 Lac Units and Kaza Industrial Feeder has annual consumption of 11 Lac Units and monthly average consumption of 1 Lac Units. The annual consumption of each feeder line is shown below in figure 2 and 3.

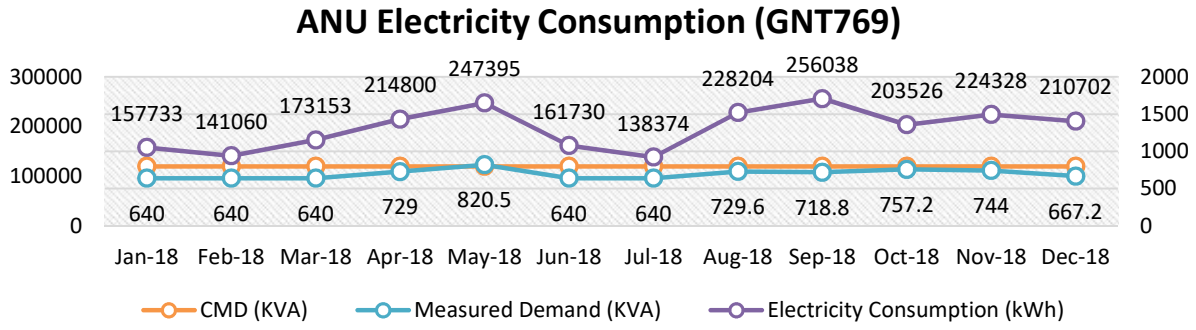


Figure 2 ANU Feeder annual electricity consumption in 2017-18.

The Right-hand side of the figure 2 and 3 shows the KVA demand having representation of contract demand and measured demand from the month of January 2018 to December 2018. ANU feeder has 800 KVA contract demand and peak demand has seen of 820 KVA in the month of May in the FY of 2018-19. The left hand of graph shows the consumption pattern of each month. For interconnection of 1 MWp solar PV power plant, contract demand should increase to 1 MVA by paying additional charges and taxes.

KAZA feeder has dedicated load of hostel buildings and pump sets which are running during night times and additionally play field lighting also supplied through this feeder regularly. CMD of the feeder is at 300 KVA which needs to increase to install 1 MWp Solar PV power plant through 11 KV overhead/underground cable under net metering.

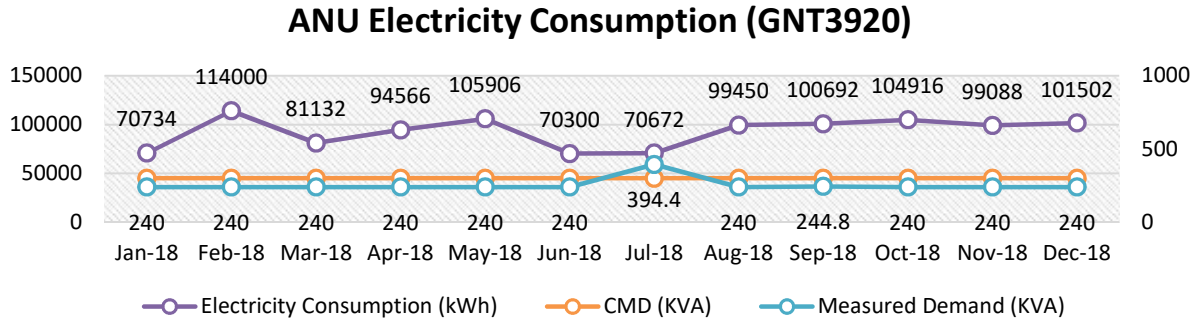


Figure 3 KAZA Feeder annual electricity consumption in 2017-18

Considering the growing demand, quantum of priority loads, roof top area and peak load timings, a grid interactive solar photovoltaic plant of 2 MWp which generates approximately 30 Lac unit in a year, seems to be suitable to augment and support the entire power requirement of each building load. During periods of holidays and non-utilization the power can be exported to grid as well which will be noted in bi-directional meters. The two existing meters for consumption reading would be replaced by the concern DE/ADE with the bi-directional meters to measure total generation from the plant and consumption of the load along with other parameters.

c) Solar Roof Design and Installation Capacity

The maximum capacity of the Roof Top Solar PV system, as mentioned on AC side at the output of inverter based on rated inverter capacity, should not be more than 80% of the sanctioned connected load as per the Andhra Pradesh Solar Power Policy 2018 which was amended to 100% later.

ANU has two contract demand with total of 1100 KVA. The campus should upgrade the contract demand of 900 KVA with APSPDCL to meet the 2 MWp Solar power synchronization. Total of 25 buildings were evaluated and selected the nearest buildings for control room to avoid voltage drops and power loss.

The first phase of project has 9 buildings which was shown in table 4 and complete PV roof layout of buildings are attached in APPENDIX B.

Table 4 Phase-I ANU Feeder Selected rooftop PV Buildings- 1 MWp

S. No	Description	Racking	Orientation	Tilt	Azimuth	Frame Size	Modules	Power
1	Administrative Building	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	71	24.9 kW
2	BTech Boys Hostel	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	671	234.9 kW
3	Central Block	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	383	134.1 kW
4	Civil and Mechanical Engineering Block	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	542	189.7 kW

5	International Students Hostel	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	158	55.3 kW
6	Mechanical Workshop	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	257	90.0 kW
7	NID & EEE Block	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	583	204.1 kW
8	University Ladies Hostel -I	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	91	31.9 kW
9	University Ladies Hostel-II	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	136	47.6 kW

The second phase of project is considered the 16 buildings having control room area behind of open auditorium building which was shown in table 5 and complete building solar roof top layouts are attached in APPENDIX B. During execution of project, if any space constraint occurs, we have scope to consider another two buildings named computer Bhavan, Power Houses which are available to set up.

Table 5 Phase -II KAZA Feeder selected rooftop PV buildings- 1 MWp

S.NO.	Description	Racking	Orientation	Tilt	Azimuth	Frame Size	Modules	Power
1	Andhra Bank	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	79	27.7 kW
2	Arts Block-I	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	172	60.2 kW
3	Arts Block-II	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	235	82.3 kW
4	Auditorium	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	97	34.0 kW
5	Centre for Distance Education Bhavan	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	523	183.1 kW

6	Dept of Biotechnology	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	202	70.7 kW
7	Dept of Chemistry	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	89	31.2 kW
8	Dept of Nano Technology	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	70	24.5 kW
9	Dept. of Statistics	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	152	53.2 kW
10	DMC Block	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	58	20.3 kW
11	Guest House	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	118	41.3 kW
12	Jainism Block	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	111	38.9 kW
13	Pariksha Bhavan	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	353	123.6 kW
14	Pharmacy and Technology Bhavan	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	330	115.5 kW
15	Vanijya Bhavan	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	135	47.3 kW
16	Vice Chancellor Bhavan	Fixed Tilt	Portrait (Vertical)	15°	180°	1x1	159	55.7 kW

The complete PV array layouts of 25 buildings are shown in APPENDIX B.

d) Electrical Interconnection

It is important to consider the preferred electrical interconnection point for the PV arrays in order to determine if any upgrades to the electrical load centers will be needed to handle the electricity generated by the system. In general, the smallest possible distance between the array and the interconnection point is preferred in order to minimize wiring losses; however, in the event a long wiring run cannot be avoided, larger cable sizing need to implement to minimize the losses.

Interconnection Voltage: (i.e., voltage level at which the PV system is connected to the grid) primarily governed by the regulation of the AP State.

Interconnection at HT Distribution System:

All electricity produced by the roof -mounted arrays from all buildings could be bring to the selected control room area (Proposed Near Power House for 1 MWp and Behind of open stadium) and Step up by the transformer and transmitted through overhead/underground cable to the substation metering point. The excess power is metered through the Bi-directional meters at feeder level.

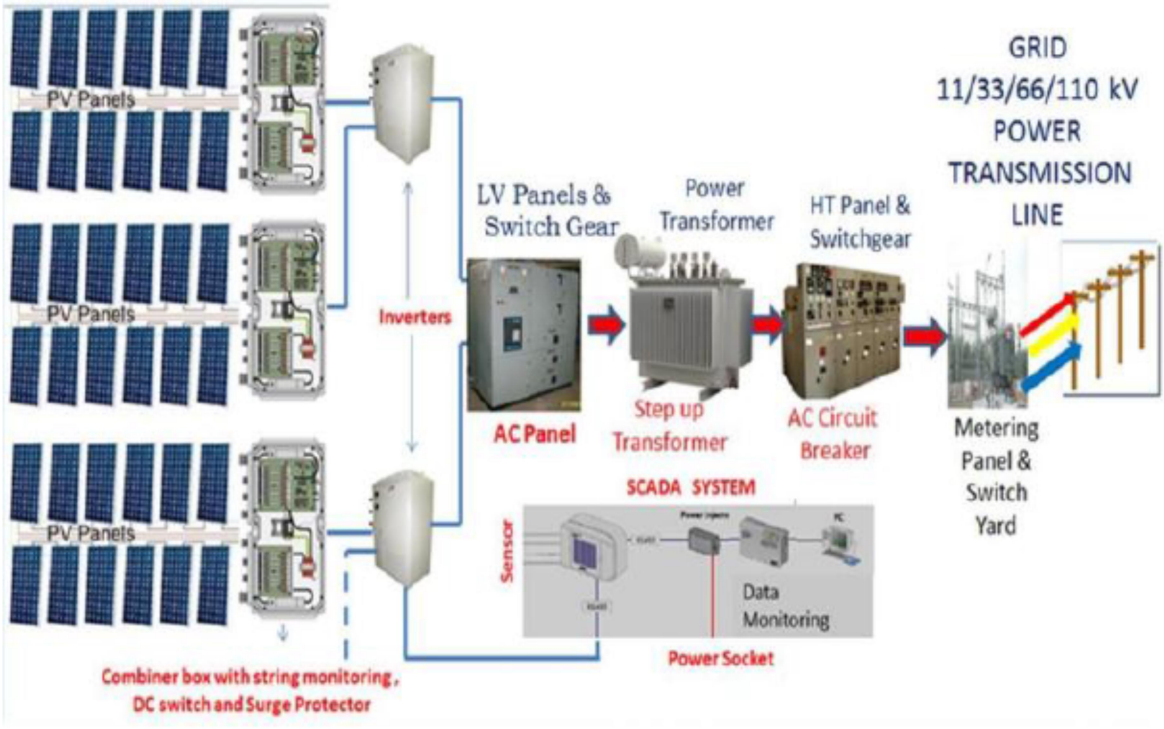


Figure 4 Schematic Diagram of 1 MWp SPV Plant with 11 KV HT Integration System

Suitable Option:

11 KV HT Interconnection System has chosen for 2 MWp Solar PV Power Plant to evade cumbersome maintenance involved for 25 building rooftop buildings in the LT network. Also, LT Interconnection has challenges like reversal of power flows across the LT network, breach of voltage regulations and erratic behaviour of LV protection systems.

The ANU campus solar capacity of each building considering distance to the interconnection point and roofs availability under concern feeder level, it is advisable to divide the roof top capacity buildings nearer to ANU feeder into 1 MWp and small roof capacities buildings

nearer to KAZA Industrial feeder into 1 MWp. The distances of each building to control room area was shown in table 9.

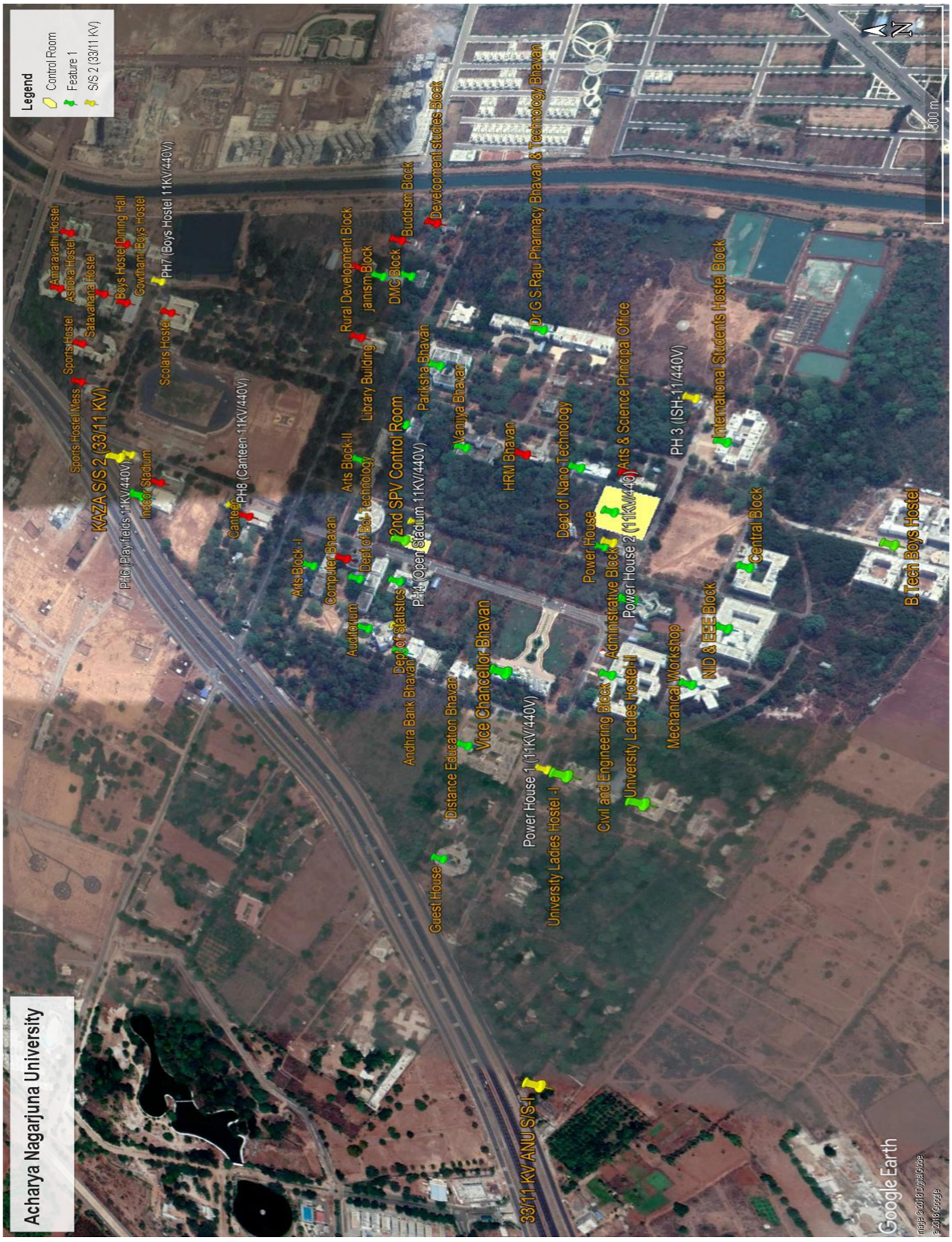
i. ANU Feeder 1 MWp: It consists of an array of solar photovoltaic panels, each panel having a capacity of 350 Wp. The output of this array is connected to an inverter which converts DC input into an AC output with fixed frequency, 50 HZ here. The inverter is made using 3-level IGBT bridge with PWM control and has in built MPPT system for extracting maximum output. All inverter output of each building brings down from roof to control room area nearer to Dept of Electrical maintenance building.

   A total distance from the concern inverter output is limited to 3000 meters distance from total 9 buildings. From the control room to steps up through 1.25 MVA separate transformer and transmit through 1 KM overhead/underground transmission line which should be lay over the campus and synchronizes to ANU Feeder.

ii. KAZA Industrial Feeder 1 MWp: The total distance from the smaller capacities of 16 buildings is limited to 5500 meters and all inverter output drop down from roofs to selected 2^{nd} control room area which is behind of open stadium and fed to a transformer which increases the voltage level to 11 KV so that power can be fed to the utility grid. The excess power measured in the KAZA Feeder bi-directional meter.

APPENDICES

APPENDIX A. Identification of ANU Campus Buildings and Substations



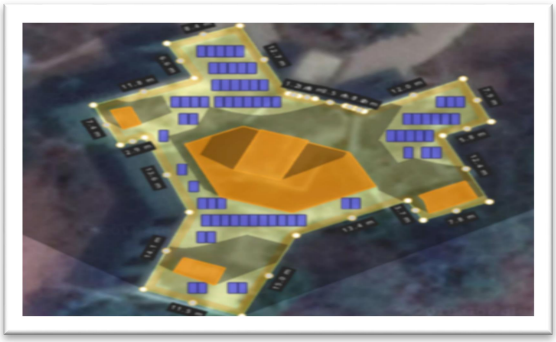
APPENDIX B. Schematic PV Array roof Layout of Selected Buildings

Evaluated more than 45 building blocks and selected 25 buildings to set up 2 MWp solar PV Power plant at Acharya Nagarjuna University, Nambur. We have divided all buildings into 2 Phases. First Phase consists of 10 buildings to setup 1 MWp and second phase is consisting of 16 buildings based on the roof size, PV capacity, and optimum distance from control room for ease of interconnection.

I) PHASE-I BUIILDINGS

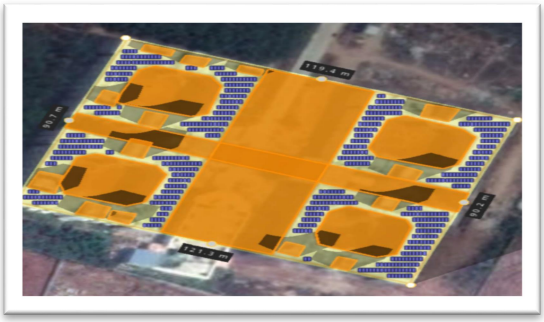
A1: ANUCET ADMINISTRATIVE BUILDING:

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room and Water Tanks
- Estimated Solar Capacity : **25 kWp**



A2: B. TECH BOYS HOSTEL

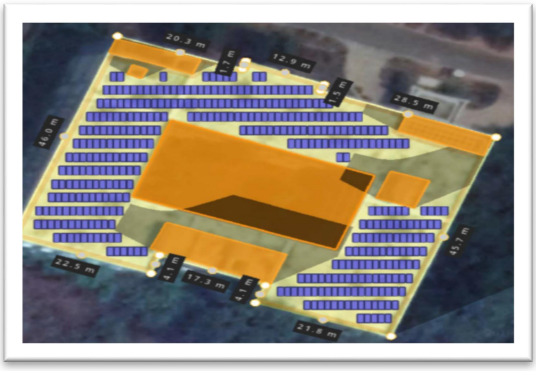
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter



- Obstructs Over Roof : Staircase Roof and Water TanksEstimated Solar Capacity : **235 kWp**

A3: CENTRAL BLOCK

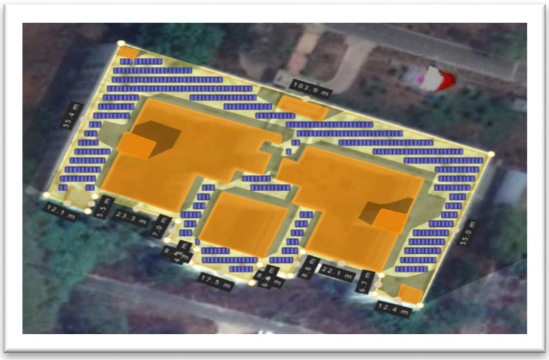
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks



- Estimated Solar Capacity : **134 kWp**

A4: CIVIL AND MECHANICAL ENGINEERING BUILDING

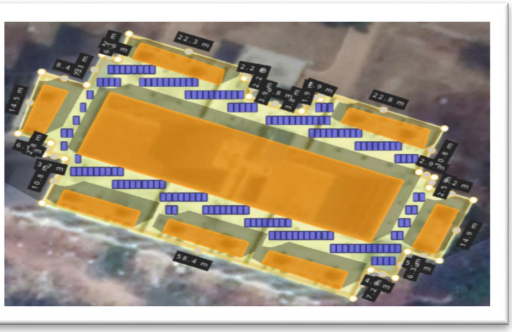
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks



- Estimated Solar Capacity : **190 kWp**

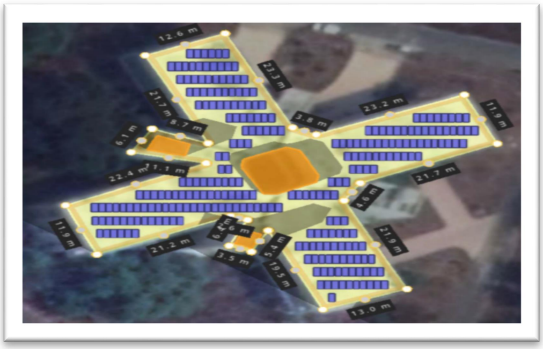
A5: INTERNATIONAL STUDENTS HOSTEL

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks
- Estimated Solar Capacity : **55 kWp**



A6: MECHANICAL WORKSHOP

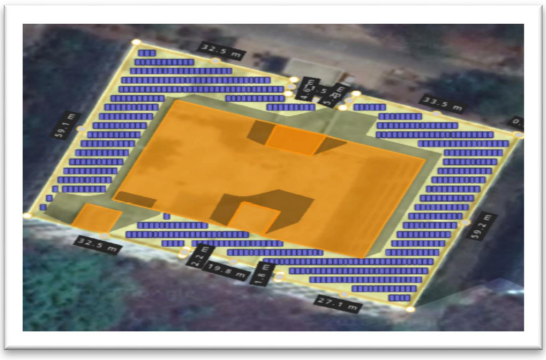
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks



- Estimated Solar Capacity : **90 kWp**

A7: NID & EEE ENGINEERING BLOCK

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks



- Estimated Solar Capacity : **204 kWp**

A8: UNIVERSITY LADIES HOSTEL-I

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks

- Estimated Solar Capacity : **32 kWp**

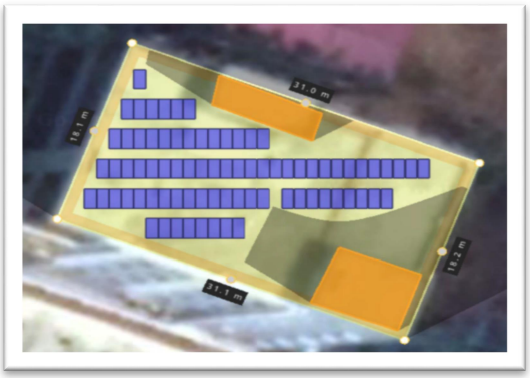
A9: UNIVERSITY LADIES HOSTEL - II

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks
- Estimated Solar Capacity : **48 kWp**

II) PHASE -II BUILDINGS

B1: ANDHRA BANK BHAVAN

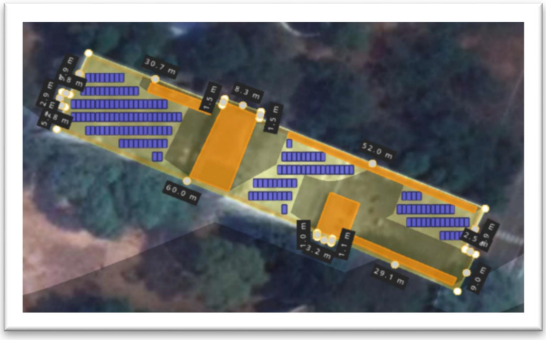
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks



- Estimated Solar Capacity : **28 kWp**

B2: ARTS BLOCK - I

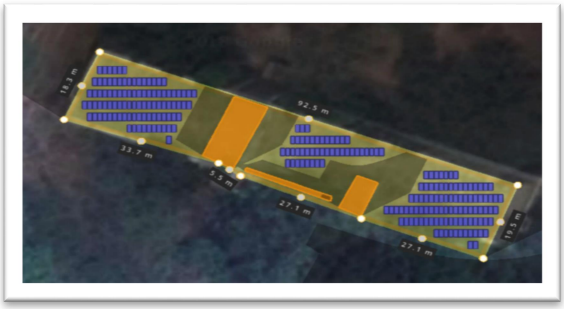
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks



- Estimated Solar Capacity : **66 kWp**

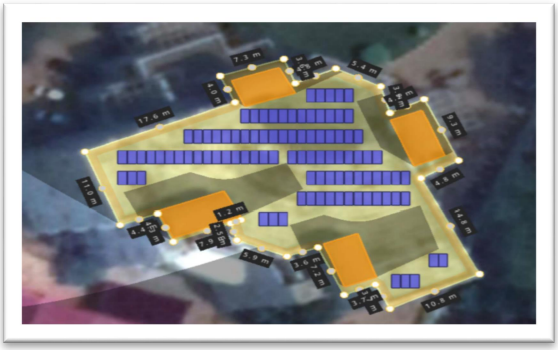
B3: ARTS BLOCK - II

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks
- Estimated Solar Capacity : **85 kWp**



B4: AUDITORIUM

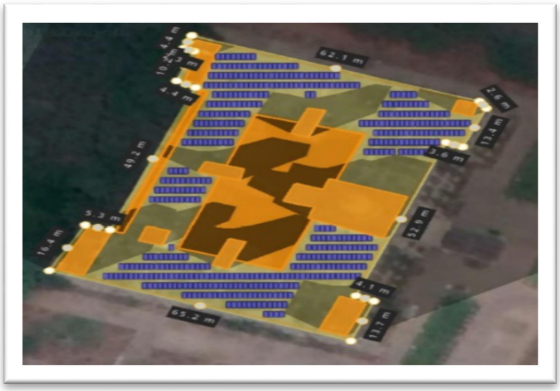
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks



- Estimated Solar Capacity : **34 kWp**

B5: CENTER FOR DISTANCE EDUCATION BUILDING

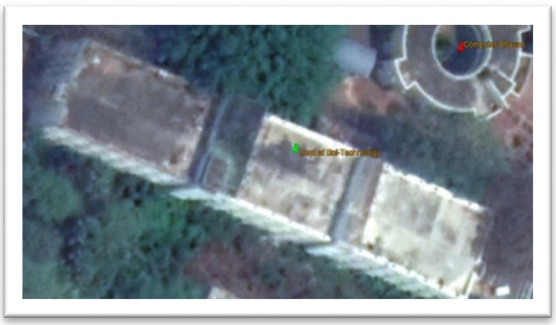
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks

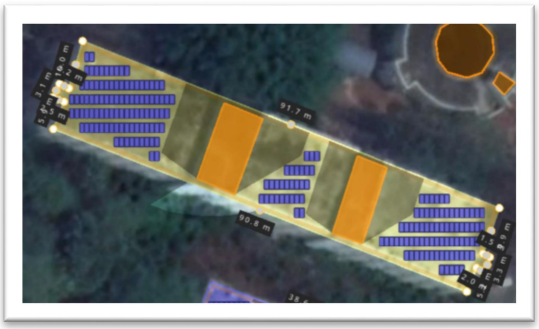


- Estimated Solar Capacity : **182 kWp**

B6: DEPT OF BIO-TECHNOLOGY

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks

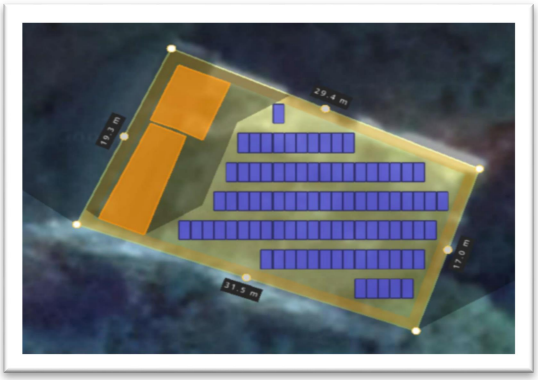




- Estimated Solar Capacity : 71 **kWp**

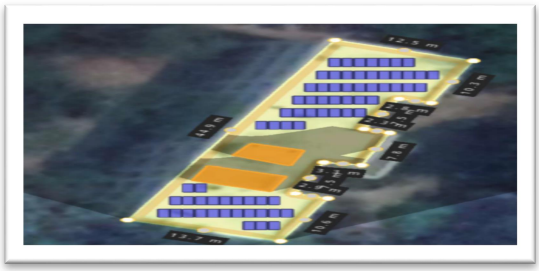
B7: DEPT OF CHEMISTRY

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks
- Estimated Solar Capacity : 31 **kWp**



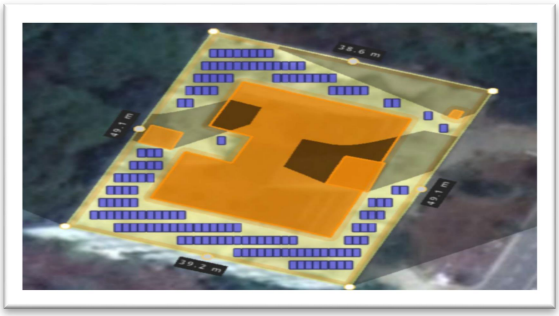
B8: DEPT OF NANO TECHNOLOGY

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks
- Estimated Solar Capacity : **25 kWp**



B9: DEPT OF STAISTICS

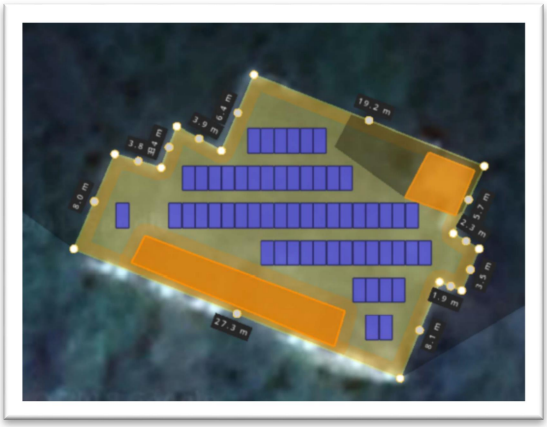
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks



- Estimated Solar Capacity : **53 kWp**

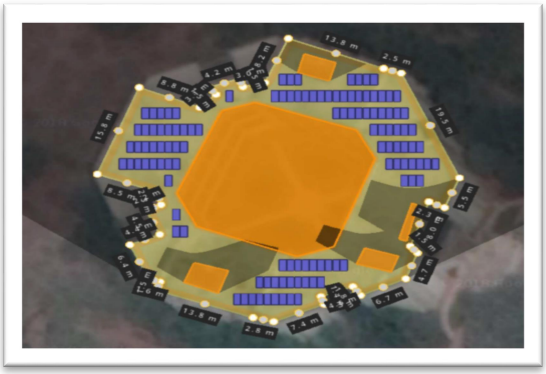
B10: DMC BUILDING BLOCK

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks
- Estimated Solar Capacity : **20 kWp**



B11: GUEST HOUSE

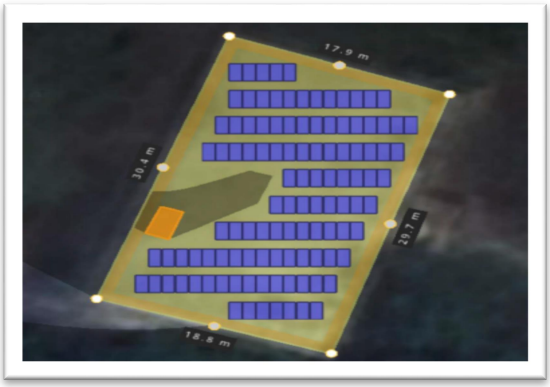
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks

- Estimated Solar Capacity : **41 kWp**

B12: JAINISM BUILDING BLOCK

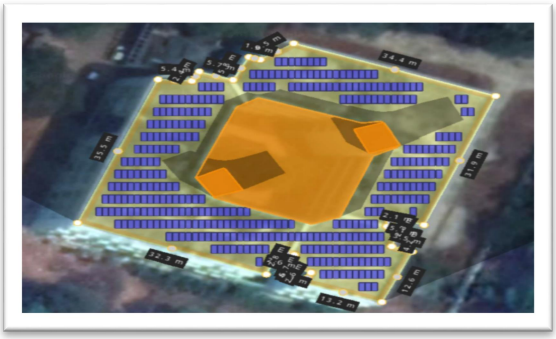
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks

- Estimated Solar Capacity : **39 kWp**

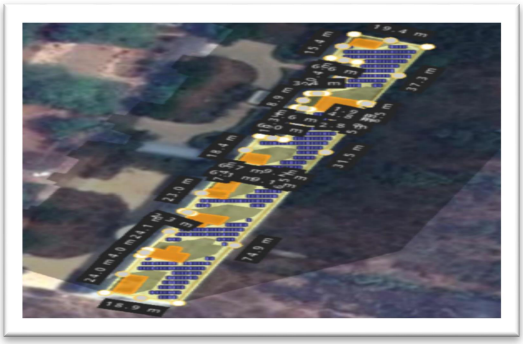
B13: PARIKSHA BHAVAN

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks
- Estimated Solar Capacity : **124 kWp**



B14: PHARMACY AND TECHNOLOGY BHAVAN

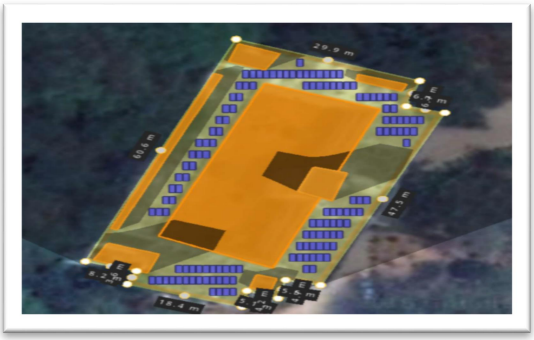
- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks



- Estimated Solar Capacity : **116 kWp**

B15: VANIJYA BHAVAN

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Room, Trees and Water Tanks



- Estimated Solar Capacity : **54 kWp**

B16: VICE CHANCELLOR BHAVAN

- Building Height : 16 Meters (G+3)
- Kind of Roof and Staircase Type : RCC Flat & RCC
- Parapet Height : 1 Meter
- Obstructs Over Roof : Staircase Roof, Trees and Water Tanks
- Estimated Solar Capacity : **56 kWp**