

ZORAM ENERGY DEVELOPMENT AGENCY (ZEDA)
ZEDA BUILDING, ABOVE 132 KV SUB-STATION, ZUANGTUI, AIZAWL

**TENDER DOCUMENT FOR CONVERSION
OF EXISTING OFF-GRID SOLAR POWER
PLANTS IN GOVERNMENT'S BUILDINGS
INTO ON-GRID SYSTEMS WITH
AGGREGATE CAPACITY OF 1018 KWP IN
MIZORAM**

(Tender No.1 of 2024)

Rs 1,500.00



(Govt. of Mizoram undertaking)

ZORAM ENERGY DEVELOPMENT AGENCY

State Nodal Agency of Ministry of New & Renewable Energy (MNRE)

ZEDA building, Above 132 KV Sub-Station,

Zuangtui, P.O. Zemabawk – 796 017,

AIZAWL, MIZORAM

Contact

Director : 0389-2350664 (Tele-Fax)

Project Director : 0389-2350665

Society Registration No. SB/ MZ-91 of 2001-2002

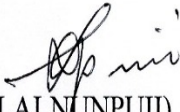
E-mail: zedaizawl@hotmail.com

NOTICE INVITING TENDER

Dated Aizawl, the 12th December 2024

No.T.12008/1/2024-ZEDA/17: Zoram Energy Development Agency (ZEDA) hereby invites Sealed Tenders, for Conversion existing off-grid solar power plants in Government's Buildings into On-grid system, from reputed manufacturers and system integrators, having experience in the relevant fields. Sealed Tenders may be submitted to the Office of the Director, ZEDA on or before 17th January 2025 till 12:00PM. Tenders will be opened on 17th January 2025 at 1:00 PM in the presence of the bidders. Tender Documents may be obtained from ZEDA Office on payment of Rs 1500.00 (Rupees One Thousand Five Hundred) only or downloaded from ZEDA website i.e., www.zeda.mizoram.gov.in.

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(LALNUNPUII)
Director, ZEDA *u*

Memo No.T.12008/1/2024-ZEDA/17

Dated Aizawl, the 12th December 2024

Copy to :

1. The P.S. to the Hon'ble Minister, Power & Electricity Department and Chairman, ZEDA Governing Board for favour of information please.
2. The Secretary to the Government of Mizoram, Power & Electricity Department, and Chairman, ZEDA Managing Committee for favour of information please.
3. The Director, Information & Public Relation Department with a request to publish the NIT in two leading Mizo Daily News Papers in one issues each only.
4. Notice Board.


Director, ZEDA *M*

UNDERTAKING OF THE TENDERER

I/We have read carefully and examined the notice inviting tender, schedule, General Rules and terms and conditions of the contract, special conditions, Schedule of Rates and other documents and Rules referred to in the tender document for the supply.

I/We hereby tender my rates for the execution of the work for ZEDA as specified within the time stipulated in the schedule in accordance with all aspects with the specifications, designs, drawings and instructions with such conditions so far as applicable.

I/We agree to keep the tender open for 6 (six) months from the due date of submission thereof and not to make any modifications in its terms and conditions. A sum of Rs 2.0 Lacs is hereby forwarded as earnest money in the form of crossed demand draft payable to ZEDA at Aizawl. If I/We, fail to commence or complete the work ordered in specified time I/We agree that the ZEDA shall, without prejudice to any other right or remedy, be at liberty to forfeit the said Earnest Money absolutely. The said Earnest Money shall be retained by ZEDA towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be required by ZEDA.

I/We hereby declare that I/We shall treat the tender documents, specifications and other records connected with the work as secret/confidential and shall not communicate information derived there-from to any person other than a person to whom I/We have authorized to communicate the same or use the information in any manner prejudicial to the safety of ZEDA/the State Govt.

I/We shall abide to all the laws and shall be responsible for making payments of all the taxes, duties, levies and other Govt. dues etc. to the appropriate Govt. Departments.

Our state sales tax registration TIN No. is _____ and GST registration No. _____. The PAN No. under the Income Tax Act is _____. I/We shall be responsible for the payment of the respective taxes to the appropriate authorities and should I/we fail to do so, I/we hereby authorize ZEDA to recover the taxes due from us and deposit the same with the appropriate authorities on their demand.

Dated: Signature

Place: Name of Tenderer/Bidder with seal

Witness

Signature:

Name:

Postal Address:

SECTION – I

INSTRUCTIONS TO BIDDERS

- 1.1. Sealed Tender/Bid must reach the office of the Director (ZEDA), latest by 12:00 P.M. on 17/01/2025. Tenders received after the time and date shall not be considered. The tenders should be submitted using three Envelopes.
 - (i) Envelope No.(1) should contain only (i) EMD (ii) Tender Fees in the form of Demand Draft payable to Director, ZEDA, Aizawl / Money receipt of the tender fees (iii) TENDER DOCUMENT: This should contain the original tender document, duly signed & seal on each page of the document. This envelope should be super scribed as 'Eligibility Documents'. **This envelope should also contain the technical proposal for conversion of existing off-grid solar power plants into on-grid systems.** All rest of the documents excluding rate sheets (price bids) should be placed in this Envelope No.(1) marked as 'Eligibility Documents'.
 - (ii) The Envelope No.(2) should contain the completely filled price bids only, marked as PRICE BIDS
 - (iii) Both these two sealed envelopes should be placed in the Envelope No.(3) {bigger one} which should invariably be super-scribed “NIT No.T.12008/1/2024-ZEDA/17, Dt 12/12/2024. Tenderer/ bidder should put their name & address on each of the three envelopes. The tenders will be opened at 1:00 P.M. on 17/01/2025.Tenders not submitted in the above manner shall be subject to rejection.
- 1.2. Tenderer/ Bidders must be either a manufacturers of SPV module or grid tied inverter or system integrator having experience in execution of design, supply, installation and commissioning of grid connected SPV rooftop system.
- 1.3. The Tenderer/ bidder must have established their Office/Service Centre in Mizoram and should have been in operational at least for a period of two years.
- 1.4. Tenderer/ bidder must have experience in installation of solar photovoltaic power plants. Copy of work orders for the previous work executed must be submitted along with the tender documents
- 1.5. Tenderer/ Bidder shall submit copies of GST registration number, TIN, PAN numbers issued by the appropriate authority.
- 1.6. The documentary evidence for meeting the eligibility criteria must be mandatorily submitted along with tender in **envelope no. 1**.
- 1.7. Tenderer/ Bidders should visit each sites (List is in the Price Bid) in order to properly quote their rates considering wide variation of site conditions.

Certificate of site visit issued by the respective beneficiaries should be attached with the tender documents. If ZEDA anticipates that rate is abnormally low or high, tender may be rejected.

- 1.8 Tender or the approved rates shall be valid for a period of six (06) months from the date of issuance of LoA.
- 1.9 Full description of particulars and complete specifications should accompany the offer. Offers should be kept open for acceptance for at least four months from the date of opening of tender.
- 1.10 The terms, conditions and specifications mentioned in tender document shall be binding on the tenderers/ bidders and no condition or stipulation contrary to the conditions shall be acceptable. It may please be noted that the tenderers/bidders who do not accept terms and conditions stipulated in this tender documents, their offers shall be liable to be rejected out rightly without assigning any reason whatsoever.
- 1.11 Each page of tender document & enclosures shall be signed by the tenderer/bidder and seal affixed. All the pages of the documents issued must be submitted along with the offer. In case of any corrections / alterations in the tender, the tenderer/bidder should attest the same; otherwise tenders may not be considered.
- 1.12 ZEDA reserves the right to reject or accept any or all tenders wholly or partly without assigning any reason on the grounds considered advantageous to ZEDA, whether it is the lowest tender or not.
- 1.13 Offers through Telegraph / Fax / Email or Open offers etc. received shall be summarily rejected.
- 1.14 All the tenderers/ bidders shall essentially indicate the break-up of prices as shown in Rate List/ Price Bid. In case any of the charges are not included in the quoted prices, the same shall be clearly shown as extra, indicating specifically the rate/scale of such charges. The lowest prices quoted shall be considered. The tenderer who had quoted the lowest price shall be preferred for placing order. ZEDA can place order for part of tender items.
- 1.15 **EARNEST MONEY:**
Each bidder should submit an earnest money of Rs.**2,00,000.00** (Rupees Two lakhs only) in a separate envelope along with the tender. The tenders not accompanied with earnest money or accompanied with inadequate earnest money will summarily be rejected and returned unopened.
- 1.16 **FORM OF EARNEST MONEY DEPOSIT:**
The earnest money deposit can be furnished in the form of **Demand Draft only** from any Scheduled Bank made payable to “Director ZEDA” at Aizawl. Cash or

Cheque shall not be accepted.

1.17 **FORFEITURE OF EARNEST MONEY DEPOSIT:**

It should be clearly understood that in the event of bidder failing to enter into the agreement in the prescribed format on their quoted rates and also fails to execute work ordered, within stipulations, if he is so communicated within the validity period of the offer, the full amount of earnest money will be forfeited and ZEDA's decision in this respect will be final and binding on the bidder. However the EMD shall be retained as security deposit after placement of orders.

1.18 **PRICE:**

The prices quoted should be firm and F.O.R. destination inclusive of all taxes and duties, packing, forwarding freight, insurance and any other incidental charges. Samples of the components shall be submitted if desired for ZEDA approval and the consignment shall be delivered/ accepted as per the approved samples only.

SECTION - II
GENERAL CONDITIONS OF CONTRACT

2.0 DEFINITIONS: In writing General Conditions of Contract, the specifications and bill of quantity, the following words shall have the meanings hereby indicated; unless there is something in the subject matter or content inconsistent with the subject.

“ZEDA” shall mean the Zoram Energy Development Agency represented through the Director.

“Work” shall mean any work entrusted to the vendor as mentioned in the scope of work and work order.

The "Engineer in charge" shall mean the Engineer or Engineers authorized by Director, ZEDA for the purpose of this contract. Inspecting Authority shall mean any Engineering person or personnel authorized by ZEDA to supervise and inspect the erection of the SPV Power Plant.

"The Contractor/vendor" shall mean the vendor awarded with the contract or their successors and permitted assigns. Contract Price shall mean the sum named in or calculated in accordance with the provisions of the contract as the contract price. General Conditions shall mean the General conditions of Contract.

‘DISCOM’ shall mean the Power & Electricity Department, Government of Mizoram

"Specifications" shall mean the specifications annexed to these General Conditions of contract and shall include the schedules and drawings attached thereto or issued to the contractor from time to time, as well as all samples and pattern, if any,

"Month" shall mean calendar month. "Writing" shall include any manuscript, typewritten, printed or other statement reproduced in any visible form whether under seal or written by hand.

2.1 CONTRACT DOCUMENT:

The term "Contract" shall mean and include the General conditions, specifications, schedules, drawings, and work orders etc., issued against the contract schedule of price or their final general conditions, any special conditions applying to the particular contract specification and drawings and agreement to be entered into. Terms and conditions not herein defined shall have the same meaning as are assigned to them in the Indian contract Act or any other Act in vogue or by any person of common knowledge and prudence.

2.2 MANNER OF EXECUTION:

Execution of work shall be carried out in an approved manner as outlined in the technical specifications or where not outlined, in accordance with relevant

MNRE/BIS/Indian Standard Specifications, to the reasonable satisfaction of the Engineer.

- i) The contractor shall start work within 20 days after the date of handing over of the site.
- ii) If at any time it should appear to the Engineer that the actual progress of works does not confirm to the programme to which consent has been given under sub-clause 3(i), the contractor shall produce at the advice of the Engineer a revised programme showing the modification to such programme necessary to ensure completion of the works within the time of completion.
- iii) All the materials required for the installation of SPV Power Plant as per Work Order issued shall be kept at site in the custody of the contractor. ZEDA shall not be responsible for any loss or damage of any material during the installation

2.3 VARIATIONS, ADDITIONS & OMISSIONS:

ZEDA shall have the right to alter, amend, omit, split or otherwise vary the quantum of work, by notice in writing to the contractor. The contractor shall carry out such variation in accordance with the rates specified in the contract so far as they may apply and where such rates are not available; those will be mutually agreed between ZEDA and the contractor.

2.4 INSPECTION DURING ERECTION:

The Engineer in Charge or his authorized representative (s) shall be entitled at all reasonable times to inspect and supervise and test during installation and commissioning. Such inspection will not relieve the contractor from their obligations under this contract

2.5 COMPLETION OF WORK:

Time being the essence of contract, the conversion works of off-grid into grid connected shall be completed **within ten months time** or as prescribed in the Work Order.

2.6 CONTRACTORS DEFAULT LIABILITY:

ZEDA may by written notice of default to the contractor, terminate the contract in circumstances detailed hereunder:

- (a) If in the opinion of the ZEDA, the contractor fails to complete the work within the time specified in the work order or within the period for which extension has been granted by ZEDA to the contractor.
- (b) If in the opinion of ZEDA, the contractor fails to comply with any of the provisions of this contract
- (c) In the event of ZEDA terminating the contract in whole or in part as provided in paragraph (a) above, ZEDA reserves the right to engage another contractor or

agency upon such terms and in such a manner as it may deem appropriate and the contractor shall be liable to pay to ZEDA for any additional costs or any losses caused to ZEDA

- (d) In the event ZEDA does not terminate the contract as provided in paragraph (a) the contractor shall continue performance of the contract, in which case he shall be liable to ZEDA for penalty for delay as set out in this tender document until the work is completed.

2.7 FORCE MAJEURE:

The contractor shall not be liable for any penalty for delay or for failure to perform the contract for reasons of FORCE MAJEURE such as, acts of public, enemy, acts of government, cyclone, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes provided that the contractor shall intimate ZEDA, within 10 (ten) days from the beginning of such delay, in writing of the cause of delay. ZEDA shall verify the facts and grant such extension as facts justify.

2.8 REJECTION OF WORKS:

In the event of any of the material supplied/ work done by the contractor is found defective in material or workman ship or otherwise not in conformity with the requirements of this contract specifications, ZEDA shall either reject the materials/work(s) or advise the contractor to rectify the same. The contractor on receipt of such notices shall rectify or replace the defective material and rectify the work, free of cost. If the contractor fails to do so, the following actions may be taken by ZEDA.

- a) At its option, ZEDA may replace or rectify such defective materials or work, and recover the extra cost so involved from the contractor, plus fifteen percent service charges of the cost of such rectification from the contractor and/ or terminate the contract for balance work/ supplies with enforcement of penalty as per contract
- b) Defective materials/ workmanship will not be accepted under any conditions and shall be rejected outright without compensation. The contractor shall be liable for any loss/ damage sustained by ZEDA due to defective work.

2.9 EXTENSION OF THE TIME:

If the completion of installation is delayed due to any reason beyond the control of the contractor, the contractor shall without delay give notice to the ZEDA in writing of his claim for an extension of time. ZEDA on receipt of such notice may agree to extend the contract/delivery date of the SPV Power Plant as may be reasonable but without prejudice to other terms and conditions of the contract.

2.10 WARRANTEE PERIOD:

The work done/ material supplied by the contractor should be warranted for satisfactory operation and against any defect in material and workmanship including Batteries (if provided) & Power Conditioning Units and other balance of equipments, at least for a period of 5(five) years, from the date of

commissioning of the SPV Power Plant including other works as per scope of work. The above warrantee certificates shall be furnished to the ZEDA for approval. Any defect noticed during this period should be rectified by the supplier free of cost upon written notice from ZEDA provided such defects may be due to bad workmanship or bad materials used. The warrantee period shall be extended by the period during which the plant remains non operative due to reasons within control of the contractors. Care should necessarily be taken to make the SPV Power plant operational, once the reporting of the fault/non operational status is done, within a week. If the Power Plant is not made operational within fifteen days ZEDA may rectify the same at the cost of the vendor.

2.11 TERMS OF PAYMENT:

Subject to any deduction which the Purchaser may be authorized to make under this contract, and or to any additions or deductions provided for in this contract, the contractor shall be entitled to payment as follows:

- All payments shall be made in Indian Rupees, and will be govern by the availability of fund from the State Government of Mizoram.
- 100% of the contract value shall be paid to the contractor after complete and successful installation, commissioning and interconnection is made with the grid on submission of commissioning report dully countersigned by the beneficiary department.
- An amount equivalent to 5% (ten percent) of contract value (excluding O & M charges) shall be retained as security deposit against performance guarantee.
- Annual maintenance charges shall be released annually on submission of tax invoice / bill by the vendor and the bill/ invoice should be accompanied by certificate of maintenance from the beneficiary
- Any other local taxes, if admissible, also will be deducted as per norms.

2.12 SECURITY DEPOSIT (SD):

5% of the contract value excluding O&M charges shall be retained as Security Deposit (SD) during the warrantee period. No interest shall be payable on the Security Deposit. Half of the security deposit for each site will be release after the expiry of two years from the date of commissioning of the last installation and another half will be release after the completion of O&M period.

2.13 INSURANCE:

The contractor shall arrange insurance coverage for the materials at his custody for the work under execution as per the conditions laid down in the relevant clause of the technical specification. The contractor shall take up insurance or such other measures for the manpower so as to cover the claim for damage

arising under workmen's compensation Act and other applicable State/ Central laws. ZEDA shall not bear any responsibility on this account

2.14 CONTRACTOR'S RESPONSIBILITY:

Notwithstanding anything mentioned in the specifications of subsequent approval or acceptance of the SPV Power Plant by ZEDA, if any, the ultimate responsibility for satisfactory performance of the entrusted work/ plant shall rest with the contractor.

2.15 RESPONSIBILITY TO RECTIFY THE LOSS AND DAMAGE:

If any loss or damage occurs to the work or any part thereof or materials/ plant/ equipments for incorporation therein the period for which the contractor is responsible for the cause thereof or from any cause whatsoever, the contractor shall at his own cost rectify/ replace such loss or damage, so that the permanent work confirms in every respect with the provision of the contract to the satisfaction of the Engineer. The contractor shall also be liable for any loss or damage to the work/equipments occasioned by him in course of any operation carried out to him during performing the contract.

2.16. RESPONSIBILITY TOWARDS THE WORKMAN OR OUTSIDERS:

ZEDA, will, in no case be responsible for any accident fatal or non-fatal, caused to any workman or outsider in course of transport or execution of work. All the expenditure including treatment or compensation will be entirely borne by the contractors. The contractor shall also be responsible for any claims of the workers including PF, Gratuity, ESI & other legal obligations.

2.17 NON-ASSIGNMENTS:

The contractor shall not assign or transfer the work orders issued as per this contract or any part thereof without the prior approval of ZEDA.

2.18 CERTIFICATES NOT TO AFFECT RIGHTS OF ZEDA:

The issuance of any certificate by ZEDA or any extension of time granted by ZEDA shall not prejudice the rights of ZEDA in terms of the contract nor shall they relieve the contractor of his obligations for due performance of the contract.

2.19 SETTLEMENT OF DISPUTES THROUGH ARBITRATION:

i. Except as otherwise specifically provided in the contract, all disputes concerning questions of fact arising under the contract shall be decided by the Managing Committee of ZEDA provided a written appeal by the contractor is made to ZEDA. The decision of the Managing Committee, ZEDA shall be final and binding to the all concerns.

ii. Any dispute or difference including those considered as such by only of the parties arising out of or in connection with the contract shall be to the extent possible be settled amicably between the parties. If amicable settlement cannot be reached then all disputed issues shall be settled by arbitration.

2.20. LAWS GOVERNING CONTRACT:

The contract shall be constituted according to and subject to the Laws of India and jurisdiction of the Gauhati High Court, Aizawl Bench.

2.21. LANGUAGE AND MEASURES:

All documents pertaining to the Contract including specifications, schedules, notice correspondences, operating and maintenance instructions, drawings or any other writings shall be written in English OR Mizo language. The metric system of measurement shall be used in this contract.

2.22. CORRESPONDENCE:

- i. Any notice to the contractor under the terms of the contract shall be served by registered mail to the registered office of the contractor or by hand to the authorized local representative of the contractor and copy by post to the contractor's principal place of business.
- ii. Any notice to ZEDA shall be served to the Director, ZEDA, Aizawl in the same manner.

2.23. SECRECY:

The contractor shall treat the details of the specifications and other documents as private and confidential and they shall not be reproduced without written authorization from ZEDA.

2.24. AGREEMENT:

The successful contractor shall have to enter into an agreement with the concerned Engineer in charge in the approved contract agreement form within 7 days of the receipt of call from ZEDA.

2.25. TENDER EVALUATION CRITERIA:

Offer of only those parties who are found qualifying based on Technical Evaluation Criteria will be taken into further consideration and prices of only those parties qualifying based of these criterion will be opened. The price quoted shall be examined thoroughly considering the materials available at the sites and the estimated capacity of the plants etc. Other things being equal, the lowest rates shall normally be preferred.

2.26. TECHNICAL:

- (i) During the approval of engineering documents, contractor will have to submit the copy of all the required certificates from the concerned manufacturers, whose materials shall be used in the SPV power Plants.
- (ii) Details of similar work done in last three years along with copies of the orders and certificates from the user agencies should be submitted along with the "Eligibility Document".
- (iii). The party should have sufficient technically qualified and well experienced manpower for execution of the project and after sales service of the systems.

SECTION – III

SCOPE OF THE WORK

The Ministry of New and Renewable Energy, Government of India (MNRE) is promoting Grid Connected Rooftop Solar (GCRTS) Programme under the scheme of PM-Surya Ghar Muft Bijli Yojana wherein central financial assistance (CFA) is being provided for installation of rooftop solar (RTS) projects in residential buildings. To promote Rooftop Programme in the State, the Government of Mizoram has also decided to provide additional subsidies for residential buildings. And at the same time the state also already had allocated budget for conversion of the existing off-grid solar power plants in government buildings into on-grid system.

Zoram Energy Development Agency (ZEDA) invites tenders/bids for conversion of existing off-grid solar power plants in government buildings into on-grid system with aggregate capacity of 1018kWp. List of tentative location is attached in Annexure-1.

The interested tenderers shall have to carry out survey and investigation and shall have to design the actual capacity of the solar power plants based on the available solar modules at the sites (List is in the Price Bid).

- 3.1 The work covers survey, investigation, design, supply, installation, commissioning and Comprehensive Maintenance Contract (CMC) for 05 (Five) Years.
- 3.2 The vendor shall take entire responsibility of electrical safety of the installations including connectivity with the grid and follow all the safety rules and regulations applicable as per Indian Electricity Act-2003 and prevailing CEA guidelines and amendments, it shall be responsibility of the vendor to take NOC from concerned authority and engage person as per provisions as per in CEA Rules and Regulations.
- 3.3 The successful bidder must adhere to the Operation and Maintenance procedure given in **Annexure-I** of this document.
- 3.4 The scope of work shall also includes the followings:
 - Detailed planning of time bound smooth execution of project.
 - Performance testing of the complete system.
 - Warranty of the system for Five year faultless operation, assure inventory maintenance.
 - After sales service will be done by the contractor, either directly or through local contractual arrangement.
 - Risk liability of all personnel associated with implementation and

realization of the project

- Training of at least two persons each to be nominated by user at every location and ZEDA, on the various aspects of design and maintenance of the offered system after commissioning of the system.
- The contractor shall maintain sufficient inventory of the spares to ensure that the system can be made functional within seventy two hours from the communication of breakdown of the system during currency of the warrantee period.
- The contractor shall run the system on trial basis and shall closely monitor the performance of the system before handing over the system, so that the assured annual power generation can be estimated for monitoring of the performance of the system. ZEDA shall examine the data of generation and ascertain if the generation is adequate with reference to the capacity of the power plant.
- Performance Guarantee Test: Successful performance guarantee test to demonstrate the rated capacity of solar power plant as per ZEDA's norms shall have to be conducted by vendor in presence of representatives of ZEDA, if required.

SECTION - IV

TECHNICAL SPECIFICATIONS

DEFINITION

A Grid Connected Solar Power Plant/ On-grid system shall consist of following equipment/components:

1. Solar Photo Voltaic (SPV) modules consisting of required number of Crystalline PV modules
2. Inverter/PCU
3. Module Mounting structures
4. Energy Meter
5. Array Junction Boxes
6. DC Distribution Box
7. AC Distribution Box
8. Protections – Earthing, Lightning, Surge
9. Cables
10. Drawing & Manuals
11. Miscellaneous

4.1 Solar PV modules

Existing solar modules at the sites shall be utilized for the purpose of conversion into on-grid system.

4.2 Inverter/PCU

- (a). Inverters/PCU should comply with applicable IEC/equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683, IS 16221 (Part 2), IS 16169 and IEC 60068-2(1,2,14,30)/Equivalent BIS Std.
- (b). Maximum Power Point Tracker (MPPT) shall be integrated in the inverter/PCU to maximize energy drawn from the array. Charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS standard. The junction boxes/enclosures should be IP 65 or better (for outdoor)/ IP 54 or better (indoor) and as per IEC 529 Specifications.
- (c). All inverters/PCUs, including hybrid grid tied systems, shall be IEC 61000 compliant for electromagnetic compatibility, harmonics, Surge, etc.
- (d). The PCU/ inverter shall have overloading capacity of minimum 10%.
- (e). Typical technical features of the inverter shall be as follows-
 - i. Switching devices: IGBT/MOSFET
 - ii. Control: Microprocessor/DSP

- iii. Nominal AC output voltage and frequency: as per CEA/State regulations
 - iv. Output frequency: 50 Hz
 - v. Grid Frequency Synchronization range: as per CEA/State Regulations
 - vi. Ambient temperature considered: -20°C to 60°C
 - vii. Humidity: 95 % Non-condensing
 - viii. Protection of Enclosure: IP-54 (Minimum) for indoor and IP-65(Minimum) for outdoor.
 - ix. Grid Frequency Tolerance range: as per CEA/State regulations
 - x. Grid Voltage tolerance: as per CEA/State Regulations
 - xi. No-load losses: Less than 1% of rated power
 - xii. Inverter efficiency (Min.): >93% (In case of 10 kW or above within-built galvanic isolation)>97% (In case of 10 kW or above without inbuilt galvanic isolation)
 - xiii. Inverter efficiency (minimum): > 90% (In case of less than 10 kW)
 - xiv. THD: < 3%
 - xv. PF: > 0.9 (lag or lead)
 - xvi. Should not inject DC power more than 0.5% of full rated output at the interconnection point and comply to IEEE 519.
- (f). The output power factor of inverter should be suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustain fault in feeder line and against the lightning on feeder.
- (g). All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:
- i. The name or trademark of the manufacturer or supplier;
 - ii. A model number, name or other means to identify the equipment,
 - iii. A serial number, code or other marking allowing identification of manufacturing location and the manufacturing batch or date within a three-month time period.
 - iv. Input voltage, type of voltage (a.c. or d.c.), frequency, and maximum continuous current for each input.
 - v. Output voltage, type of voltage (a.c. or d.c.), frequency, maximum continuous current, and for a.c. outputs, either the power or power factor for each output.
 - vi. The Ingress Protection (IP) rating
- (h). Marking shall be located adjacent to each fuse or fuse holder, or on the fuse holder, or in another location provided that it is obvious to which fuse the marking applies, giving the fuse current rating and voltage rating for fuses that may be changed at the installed site.

- (j). In case the consumer is having a 3- ϕ connection, 1- ϕ /3- ϕ inverter shall be provided by the vendor as per the consumer's requirement and regulations of the State.
- (k). Inverter/PCU shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- (l). The Inverter should have a provision of remote monitoring of inverter data through sim card. Required website/mobile app platform, where the user (Consumer) can access the data, should be provided/explained to consumer while installation. Additionally, if inverter has the facility of in-built wi-fi module, that should also be explained to the consumer. On demand, Inverter should also have provision to feed the data to the remote monitoring server using relevant API/ protocols. All the inverter data should be available for monitoring by giving web access.
- (m). Integration of PV Power with Grid & Grid Islanding:
 - i. The output power from SPV would be fed to the inverters/PCU which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization.
 - ii. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided, if not available in inverter.
 - iii. MCB/MCCB or a manual isolation switch, besides automatic disconnection to grid, would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

4.3 Module Mounting Structure (MMS): Existing structure shall be utilized wherever possible.

4.4 Metering

- (a). A Roof Top Solar (RTS) Photo Voltaic (PV) system shall consist of following energy meters:
 - i. Net meter: To record import and export units
 - ii. Generation meter: To keep record for total generation of the plant.

- (b). The installation of meters including CTs & PTs, wherever applicable, shall be carried out by the Empanelled Vendor as per the terms, conditions and procedures laid down by the concerned SERC/DISCOMs.

4.5 Array Junction Boxes:

- (a). New junction boxes are to be provided, wherever required, in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands. Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- (b). Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP 65 or better standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry, Single /double compression cable glands should be provided.
- (c). Polyamide glands and MC4 Connectors may also be provided. The rating of the junction box shall be suitable with adequate safety factor to interconnect the Solar PV array.
- (d). Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.
- (e). Junction boxes shall be mounted on the MMS such that they are easily accessible and are protected from direct sunlight and harsh weather.

4.6. DC Distribution Box (DCDB):

- a. DC Distribution Box(s) are to be provided to receive the DC output from the PV array field (Existing DCDB may also be utilized if they are in good conditions).
- b. DCDBs shall be dust & vermin proof conform having IP 65 or better protection, as per site conditions.
- c. The bus bars are made of EC grade copper of required size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the inverter along with necessary surge arrestors. MCB shall be used for currents up to 63 Amperes, and MCCB shall be used for currents greater than 63 Amperes.

4.7. AC Distribution Box (ACDB):

- a. AC Distribution Panel Board (DPB) shall control the AC power from inverter, and should have necessary surge arrestors, if required. There is interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- b. All switches and the circuit breakers, connectors should conform to IEC 60947:2019, part I, II and III/ IS 60947 part I, II and III.
- c. The isolators, cabling work should be undertaken as part of the project.
- d. All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on $1-\phi/3-\phi$, 415 or 230 volts, 50 Hz (or voltage levels as per CEA/State regulations).
- e. The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
- f. All indoor panels will have protection of IP 54 or better, as per site conditions. All outdoor panels will have protection of IP 65 or better, as per site conditions.
- g. Should conform to Indian Electricity Act and CEA safety regulations (till last amendment).
- h. All the 415 or 230 volts (or voltage levels as per CEA/State regulations) AC devices / equipment like bus support insulators, circuit breakers, SPDs, Voltage Transformers (VTs) etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions.
 - (i) Variation in supply voltage: as per CEA/State regulations
 - (ii). Variation in supply frequency: as per CEA/State regulations
- i. The inverter output shall have the necessary rated AC surge arrestors, if required and MCB/ MCCB. RCCB shall be used for successful operation of the PV system, if inverter does not have required earth fault/residual current protection.

4.8 Protections

The system should be provided with all necessary protections like earthing, Lightning, and Surge Protection, as described below:

4.9 Earthing Protection

- i. The earthing shall be done in accordance with latest Standards.
- ii. Each array structure of the PV yard, Low Tension (LT) power system, earthing grid for switchyard, all electrical equipment, inverter, all junction boxes, etc. shall be grounded properly as per IS 3043-2018.
- iii. All metal casing/ shielding of the plant shall be thoroughly grounded in accordance with CEA Safety Regulation 2010. In addition, the lightning arrester/masts should also be earthed inside the array field.
- iv. Earth resistance should be as low as possible and shall never be higher than 5 ohms.

- v. For 10 KW and above systems, separate three earth pits shall be provided for individual three earthings viz.: DC side earthing, AC side Earthing and Lightning arrestor earthing.

4.10. Lightning Protection

- i. The SPV power plants shall be provided with lightning & over voltage protection, if required. The main aim in this protection shall be to reduce the overvoltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc.
- ii. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors (LAs). Lightning protection should be provided as per NFC17-102:2011/IEC 62305 standard.
- iii. The protection against induced high-voltages shall be provided by the use of Metal Oxide Varistors (MOVs)/Franklin Rod type LA/Early streamer type LA.
- iv. The current carrying cable from lightning arrestor to the earth pit should have sufficient current carrying capacity according to IEC 62305. According to standard, the minimum requirement for a lightning protection system designed for class of LPS III is a 6 mm² copper/ 16 mm² aluminum or GI strip bearing size 25*3 mm thick). Separate pipe for running earth wires of Lightning Arrestor shall be used.

4.11. Surge Protection

- i. Internal surge protection, wherever required, shall be provided.
- ii. It will consist of three SPD type-II/MOV type surge arrestors connected from +ve and -ve terminals to earth.

4.12. CABLES

- a). All cables should conform to latest edition of IEC/equivalent BIS Standards alongwith IEC 60227/IS 694, IEC 60502/IS 1554 standards.
- b). Cables should be flexible and should have good resistance to heat, cold, water, oil, abrasion etc.
- c). Armored cable should be used and overall PVC type 'A' pressure extruded insulation or XLPE insulation should be there for UV protection.
- d). Cables should have Multi Strand, annealed high conductivity copper conductor on DC side and copper/FRLS type Aluminum conductor on AC side. For DC cabling, multi-core cables shall not be used.
- e). Cables should have operating temperature range of -10°C to +80°C and voltage rating of 660/1000 V.

- f). Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop less than 2% (DC Cable losses).
- g). The size of each type of AC cable selected shall be based on minimum voltage drop. However; the maximum drop shall be limited to 2%.
- h). The electric cables for DC systems for rated voltage of 1500 V shall conform to BIS 17293:2020.
- i). All cable/wires are to be routed in a RPVC pipe/ GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable is easily identified.
- j). All cable trays including covers to be provided.
- k). Thermo-plastic clamps to be used to clamp the cables and conduits, at intervals not exceeding 50 cm.
- l). Size of neutral wire shall be equal to the size of phase wires, in a three phase system.
- m). The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25 years.

4.13. DRAWINGS& MANUALS:

- a. Operation & Maintenance manual/user manual, Engineering and Electrical Drawings shall be supplied along with the power plant.
- b. The manual shall include complete system details such as array lay out, schematic of the system, inverter details, working principle etc.
- c. The Manual should also include all the Dos & Don'ts of Power Plant along with Graphical Representation with indication of proper methodology for cleaning, Operation and Maintenance etc.
- d. Step by step maintenance and troubleshooting procedures shall also be given in the manuals.
- e. Vendors should also educate the consumers during their AMC period.

4.14. Miscellaneous:

- a. Connectivity: The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the SERC regulation for Grid connectivity and norms of DISCOM and amended from time to time.
- b. Safety measures: Electrical safety of the installation(s) including connectivity with the grid must be taken into account and all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA Safety Regulation 2010 etc. must be followed.
- c. Shadow analysis: The shadow analysis report with the instrument such as Solar Pathfinder or professional shadow analysis software of each site should be provided and the consumer should be educated to install the

system only in shadow free space. Lower performance of the system due to shadow effect shall be liable for penalty for lower performance.

- d. Firefighting system - Portable fire extinguishers/sand buckets shall be provided wherever required as per norms.

4.15. Quality Certification, Standards and Testing for Grid-Connected Rooftop Solar PV Systems/Power Plants:

Solar PV Inverters	
IEC62109or IS: 16221	Safety of power converters for use in photovoltaic power systems –Part1:Generalrequirements, and Safety of power converters for use in photovoltaic power systems Part2:Particularrequirementsforinverters.Safetycompliance(Protection degreeIP65 or betterforoutdoormounting,IP54 or better for indoor mounting)
IS/IEC61683latest (as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency(10%,25%,50%,75%&90-100%LoadingConditions)
IEC 60068-2 /IEC62093 (as applicable)	Environmental Testing of PV System–Power Conditioners and Inverters
IEC 62116:2014/ IS16169	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
Fuses	
IS/IEC60947(Part 1, 2 &3),EN50521	Generalsafetyrequirementsforconnectors,switches,circuitbreakers(AC/DC): 1)Low-voltage Switch gear and Control-gear,Part1:Generalrules 2)Low-VoltageSwitchgearandControl-gear,Part2:CircuitBreakers 3)Low-voltageswitchgearandControl-gear,Part3:Switches,disconnectors switch-disconnectors and fuse-combination units 4) EN50521:Connectorsforphotovoltaicsystem-Safetyrequirementsandtests
IEC60269-6:2010	Low-voltagefuses-Part6:Supplementaryrequirementsforfuse-linksforthe protection of solar photovoltaic energy systems
Surge Arrestors	
BFC17-102:2011/ NFC 102:2011/ IEC 62305	Lightening Protection Standard

IEC 60364-5-53/ IS15086-5(SPD) IEC 61643- 11:2011	Electrical installations of buildings-Part 5-53: Selection and erection of electrical equipment-Isolation, switching and control Low-voltage surge protective devices-Part 11: Surge protective devices connected to low-voltage power systems-Requirements and test methods
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1&2)/IEC 69947(as applicable)	General test and measuring method for PVC (Polyvinylchloride) insulated cables (for working voltages up to and including 1100V, and UV resistant for outdoor installation)
BSEN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC Cables
Earthing/Lightning	
IEC 62561/IEC 60634 Series (Chemical earthing) (as applicable)	IEC 62561-1: Lightning protection system components (LPSC) - Part: Requirements for connection components IEC 62561-2: Lightning protection system components (LPSC) – Part 2: Requirements for conductors and earth electrodes IEC 62561-7: Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	Junction boxes and solar panel terminal boxes shall be of the thermo-plastic type with IP 65 or better protection for outdoor use, and IP 54 or better protection for indoor use

SCHEDULE – I

PAST EXPERIENCE

From :
Tenderer's Name & Address –
To,

The Director
ZEDA
Mizoram Aizawl.

Subj : Performance / past experience.

Dear Sir,

We furnish herewith the record of our performance and experience as follows :-

Sl. No.	Purchaser's Name & Address	Order No. & Date	Ordered Quantity	Qty.supplied (Nos)	Value of Order
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PLACE :

SIGNATUR OF TENDERER

DATE :

NAME IN FULL
DISIGNATION / STATUS
FIRM / COMPANY SEAL

NOTE : Photocopy of the orders & performance reports received from other State Agencies / Govt. Undertakings etc. should be produced, if required.

Operation and Maintenance Guidelines of Grid Connected PV Plants

1. For the optimal operation of a PV plant, maintenance must be carried out on a regular basis.
2. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place.
3. Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

SOLAR PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

- i. The panels are cleaned at least once every fifteen days.
- ii. Any bird droppings or spots should be cleaned immediately.
- iii. Use water and a soft sponge or cloth for cleaning.
- iv. Do not use detergent or any abrasive material for panel cleaning.
- v. Iso-propyl alcohol may be used to remove oil or grease stains.
- vi. Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
- vii. Wipe water from module as soon as possible.
- viii. Use proper safety belts while cleaning modules at inclined roofs etc.
- ix. The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
- x. Check if there are any shade problems due to vegetation or new building. If there are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
- xi. Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.
- xii. Never use panels for any unintended use, e. g. drying clothes, chips etc.
- xiii. Ensure that monkeys or other animals do not damage the panels.

CABLES AND CONNECTION BOXES

- i. Check the connections for corrosion and tightness.
- ii. Check the connection box to make sure that the wires are tight, and the water seals are not damaged.
- iii. There should be no vermin inside the box.
- iv. Check the cable insulating sheath for cracks, breaks or burns. If the insulation is damaged, replace the wire
- v. If the wire is outside the building, use wire with weather-resistant insulation.
- vi. Make sure that the wire is clamped properly and that it should not rub against

- any sharp edges or corners.
- vii. If some wire needs to be changed, make sure it is of proper rating and type.

INVERTER

- i. The inverter should be installed in a clean, dry, and ventilated area which is separated from, and not directly above, the battery bank.
- ii. Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
- iii. Check that vermin have not infested the inverter. Typical signs of this include
- iv. Spider webs on ventilation grills or wasps' nests in heat sinks.
- v. Check functionality, e.g. automatic disconnection upon loss of grid power supply, at least once a month.
- vi. Verify the state of DC/AC surge arrestors, cable connections, and circuit breakers.

SHUTTING DOWN THE SYSTEM

- i. Disconnect system from all power sources in accordance with instructions for all other components used in the system.
- ii. Completely cover system modules with an opaque material to prevent electricity from being generated while disconnecting conductors.
- iii. To the extent possible, system shutdown will not be done during daytime or peak generation.

INSPECTION AND MAINTENANCE SCHEDULE:

Component	Activity	Description	Interval	By
PV Module	Cleaning	Clean any bird droppings/ dark spots on module	Immediately	Beneficiary
	Cleaning	Clean PV modules with plain water or mild dishwashing detergent. Do not use brushes, any types of solvents, abrasives, or harsh detergents.	Fortnightly or as per the site conditions	Beneficiary

	Inspection (for plants > 100kWp)	Use infrared camera to inspect for hot spots; bypass diode failure	Annual	Technician
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Component	Activity	Description	Interval	By
PV Array	Inspection	Check the PV modules and rack for any damage. Note down location and serial number of damaged modules.	Annual	User/Technician
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the, array and move them if possible.	Annual	User/Technician
	Vermin Removal	Remove bird nests or Vermin from array and rack area.	Annual	User/Technician
Junction Boxes	Inspection	Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. Check position of switches and breakers. Check operation of all protection devices.	Annual	Electrician
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual	Electrician
Inverter	Inspection	Observe	Quarterly	Electrician
Component	Activity	Description	Interval	By

		Instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. Inspect Inverter housing or shelter for physical maintenance, if required.		
Inverter	Service	Clean or replace any air filters.	As needed	Electrician
Instruments	Validation	Spot-check monitoring instruments (pyranometer etc.) with standard instruments to ensure that they are operational and within specifications.	Annual	PV Specialist
Transformer	Inspection	Inspect transformer oil level, temperature gauges, breather, silica gel, meter, connections etc.	Annual	Electrician
Tracker (if present)	Inspection	Inspect gears, gear boxes, bearings as required.	Annual	Technician
	Service	Lubricate tracker mounting bearings, gearbox as required.	Bi-annual	Technician
Plant	Monitoring	Daily Operation and Performance Monitoring	Daily	Beneficiary

Inverter	Inspection	Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. Inspect Inverter housing or shelter for physical maintenance, if required.	Quarterly	Electrician
Inverter	Service	Clean or replace any air filters.	As needed	Electrician
Instruments	Validation	Spot – check monitoring instruments (pyranometer etc.) with standard instruments to ensure that they are operational and within specifications.	Annual	PV Specialist
Transformer	Inspection	Inspect transformer oil level, temperature gauges, breather, silica gel, meter, connections etc.	Annual	Electrician
Tracker (if present)	Inspection	Inspect gears, gear boxes, bearings as required.	Annual	Technician
	Service	Lubricate tracker mounting bearings, gearbox as required.	Bi-annual	Technician
Plant	Monitoring	Daily Operation and Performance Monitoring	Daily	Beneficiary
Spare Parts	Management	Manage inventory of spare parts.	As needed	Site in charge
Logbook	Documentation	Document all O&M activities in a workbook available to all service personnel	Continuous	Site in charge

Operation and Maintenance Guidelines of Grid Connected PV Plants

- i. Periodic cleaning of solar modules, preferably once every fortnight. As this task has to be done by the beneficiary, the vendors shall apprise the beneficiary on the importance and proper technique for cleaning.
- ii. O&M of Solar Power Plant shall be compliant with grid requirements to achieve committed energy generation.
- iii. Periodic checks of the Modules, PCUs and BoS shall be carried out as a part of routine preventive and breakdown maintenance.
- iv. Immediate replacement of defective Modules, Invertors/PCUs and other equipment as and when required.
- v. Supply of all spares, consumables and fixtures as required. Such stock shall be maintained for all associated equipment and materials as per manufacturer/supplier's recommendations.
- vi. All the equipment testing instrument required for Testing, Commissioning and O&M for the healthy operation of the Plant shall be maintained by the Bidder. The testing equipment must be calibrated once every 2 years from NABL accredited labs and the certificate of calibration must be kept for reference as required.
- vii. If negligence/ mal operation on part of the Bidder's operator results in failure of equipment, such equipment should be repaired/ replaced by the Bidder free of cost.
- viii. If any jobs covered in O&M Scope as per RFP are not carried out by the contractor/ Bidders during the O&M period, the Engineer-In-Charge shall take appropriate action as deemed fit.
- ix. *Zoram Energy Development Agency (ZEDA)* reserves the right to make surprise checks/ inspection visits at its own or through authorized representative to verify the O&M activities being carried out by the Bidder. Failure to adhere to above guidelines will result in penal action including debarring from participation in next tender

Annexure-II

Sl. No	Item Description	Observation	Remarks
1	Name of sit/ Plant		
2	Capacity of the solar plant in kWp		
3	Year of installation		
4	Capacity of single solar PV module in Wp and make of PV module		
5	Nos. of existing solar Module		
6	Nos. of battery and capacity of single battery in V AH		
7	Make of Battery		
8	Functionality of the solar plant		
9	Nos. of damaged/ broken module (if any)		
10	No of modules in series and total no of series string		
11	Module wiring condition upto AJB and approximate distance from AJB to PCU/Inverter		
12	Total No of SJB/ AJB/ MJB		
13	MMS type and its foundation condition		
14	Solar PCU Capacity and make		
15	PCU output Single Phase/ Three Phase		
16	PCU Condition and functionality		
17	Condition of ACDB and DCDB and functionality		
18	Sanctioned load/ Contracted demand of the department		
19	Required rating of the bi-directional meter		
20	Average monthly electricity consumption in KWh		
21	No of Earth Pit, LA and their condition		

Date of survey

Name and signature of the surveyor of the Firm/ Company

Note: The Bidder should submit site wise survey report along with the eligibility documents

SECTION V

**PRICE BID FOR CONVERSION OF EXISTING OFF GRID SOLAR POWER
PLANTS IN GOVERNMENT BUILDINGS INTO ON-GRID SYSTEMS**

Sl. No.	Location of Solar Plant	Plant Capacity in kWp	Propose Capacity after survey & investigation in Rs.	Cost of materials in Rs	Cost of installation & Commissioning in Rs	Cost of Annual maintenance for a period of five years in Rs.	Total in Rs
1	New Vervek Police Outpost	5					
2	Directorate of School Education, Aizawl	10					
3	Mara House, Zotlang, Aizawl	30					
4	Phaisen Police Outpost, Kolasib	25					
5	J.Thankima College, Bawngkawn , Aizawl	10					
6	Govt. Khawzawl College	10					
7	Sericulture Mulberry Seed Farm, Champhai	10					
8	DC Office, Mamit	10					
9	DC Quarters, Mamit	10					
10	Office of EE, WATSAN Division, PHE, Kolasib	10					
11	District Sericulture Office, Mamit	10					
12	BDO Office, Hnahthial	10					
13	Mulberry Seed Farm, Thenzawl	10					
14	Tourist Lodge, Chaltlang	50					
15	Office of the Conservator of Forest, Southern Circle, Lunglei	10					
16	Office of the Conservator of Forest, Northern Circle, Kolasib	10					
17	DFO Office, Champhai	10					
18	DFO Office, Thenzawl	10					
19	DFO Office, Kolasib	10					
20	DFO Office, Mamit	10					
21	DFO Office, Lunglei Forest Division	10					
22	DFO Office, Khawzawl	10					
23	1st IR Battalion	30					
24	2nd IR Battalion, Khawzawl	50					
25	SP Office Complex, Serchhip	50					
26	SP Office, Lawngtlai	48					
27	2nd Battallion MAP, Lunglei	50					
28	SP Office, Champhai	50					
29	Auditorium of Zirtiri Residential Science College, Durtlang	10					
30	Serchhip Hospital	80					
31	Champhai Hospital	80					
32	Mamit Hospital	80					
33	Lawngtlai Hospital	80					
34	Observation (Special Home), Durtlang	15					
35	Directorate of Sericulture building, Chaltlang	20					
36	Protective Home, Hunthar	25					
37	Office of the Chief Informatic Officer, ICT Department	10					
38	Sericulture Cold Storage, Zemabawk	25					
39	Serkawn Christian Hospital	25					
	Total	1018					

Name and Signature of the Bidder