MAHARASHTRA ENERGY DEVELOPMENT AGENCY, DIVISIONAL OFFICE, NAGPUR

(A Government of Maharashtra Institution)

E- TENDER FOR

SURVEY, DESIGN, FABRICATION, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND OPERATION & MAINTENANCE FOR A PERIOD OF 5 YEARS OF TOTAL 227 kWp CAPACITY GRID-CONNECTED SOLAR PV POWER PLANT UNDER ROOF – TOP NET METERING AT VARIOUS 13 INDUSTRIAL TRAINING INSTITUTE BUILDINGS IN CHANDRAPUR DISTRICT IN THE STATE OF MAHARASHTRA.

Tender Reference No.

REN/SOLAR-CH/ITI/2022-23/199

https://mahatenders.gov.in

TENDER DOCUMENT

Divisional General Manager (Nagpur)
MAHARASHTRA ENERGY DEVELOPMENT AGENCY
C/o Milk development Employee housing Co-operative Society, First Floor S. No. 244-A/5-N, Ward No. 66,Pam Road, Civil Lines G P O Square, Nagpur -440 001
Phone No: - 0712-2564256
E-mail ID: - domedanagpur@mahaurja.com

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SECTION-I

BID INVITATION

- **Brief Description of the Bidding Process:**
- **The Divisional General Manager (Division Office Nagpur),** on behalf of **MEDA (the Employer**), invites eligible bidder to submit a bid in accordance with the provisions of this Tender Document. In this Tender Document, the term "Bidder", which expression shall, unless repugnant to the context, include all parties who have submitted bids in response to this Tender Document within the stipulated time frame for submission.
- The Bidders shall submit the bids in two parts by following e-tendering process described in bidding documents. First part comprises of the Technical bid and the second part comprise of the financial bid in accordance with this Tender Document.
- In terms of the Tender Document, a Bidder will be required to deposit non-refundable Tender document fee, along with its tender, the refundable Earnest Money Deposit (EMD).
- Divisional Office Nagpur will open the technical bid of the Bidder, by e-tendering process. The financial bid will be opened of those bidders which are qualified in technical bid.

Bidding Information:

1	Tender Reference No.	**REN/SOLAR-CH/ITI/2022-23/199**
2	Date of sale of Tender document	24.01.2023
3	Last date and Time of submission of Bids	07.02.2023
4	Date & Time of opening of Technical Bid	08.02.2023
5	Date & Time of Pre-Bid Meeting	30.01.2023
6	Estimated Cost. As per the Bench mark cost of MNRE with 5 years CMC for **total 227 kw** capacity grid-connected solar pv power plant under roof – top net metering at Various ITI Buildings in Chandrapur District in the state of Maharashtra.	**Rs. 1,06,73,924/-**
7	Earnest Money Deposit (EMD) in favour of Maharashtra Energy Development Agency for total 227 kw capacity grid-connected solar power plant under roof – top net metering at Various ITI Buildings in Chandrapur District in the state of Maharashtra.	**Rs. 1,06,739/-**

8	Security Deposit:	3%* of contract value by Demand Draft (DD) in favour of MEDA payable at Chandrapur.
9	Address for communication and Venue for Tender opening	Divisional General Manager (Nagpur) MAHARASHTRA ENERGY DEVELOPMENT AGENCY C/o Milk development Employee housing Co-operative Society, First Floor S. No. 244-A/5-N, Ward No. 66,Pam Road, Civil Lines G P O Square, Nagpur -440 001 Phone No: - 0712-2564256
10	Tender Document fee	**Rs. 11,800/-** (Rs. Eleven Thousand Eight Hundred Only) Non-refundable & Non-Transferable) to be submitted online. (including 18% GST)

- If any technical difficulties arise while filling up e-tender, please contact Divisional Office MEDA, Nagpur. It is compulsory to pay tender document fee, EMD through E-payment at https://mahatenders.gov.in
- Eligible bidders can upload the Tenders through Maha-e-tender portal of GoM: https://mahatenders.gov.in

SECTION-II

INFORMATION AND INSTRUCTION TO BIDDERS

The Divisional General Manager MEDA, Nagpur on behalf of MEDA (the Employer), invites bids from eligible bidders for "works" include Design, Fabrication, Supply, Installation, Testing, Commissioning and Operation & Maintenance for a period of 5 years of total 227 kW capacity Grid-Connected Solar PV Power Plant under roof-top net metering at various 13 Industrial Training Institute (ITI) Buildings in Chandrapur District in the state of Maharashtra (Herein after referred to as the contract of works) and as described in the tender document on "Turnkey Contracts" under Tender No **REN/SOLAR-CH/ITI/2022-23/199**

Scope of Contract

The Scope of contract is as below:

- Design, Fabrication, Supply, Installation, Testing, Commissioning and Operation & Maintenance for a period of 5 years of total 227 kW capacity Grid-Connected Solar PV Power Plant under roof-top net metering at various 13 Industrial Training Institute (ITI) Buildings in Chandrapur District in the state of Maharashtra on **"Turnkey**" Contract Basis and as described in the Tender Document.
- Free replacement of defective components of systems within Comprehensive Maintenance Contract period (CMC) of 5 years after commissioning for efficient running of the Grid-connected Solar Photovoltaic Power Plants.
- Successful Bidder(s) will be responsible to register these projects by operation and management arrangements and rules, regulations and modalities as per MNRE and as established by MEDA and mutually agreed between MEDA and the contractor for effective implementation of the project.
- The Works are to be carried out at 13 Various ITI in Chandrapur District in the state of Maharashtra Bidder **can quote only after the site visit**.
- The successful Bidder will be required to complete the works within the stipulated time as specified in the tender document. The bidder shall ensure that sites of Solar Photovoltaic Power Plants should be installed and commissioned within **120 Days** from the date of receipt of work order.
- Selected bidder shall bind to operate and maintain the system as per the rules and regulations and modalities as prescribed by MNRE and MEDA for effective functioning of the project.
- Bids shall be complete and cover all Works described in the tender. However, if any item of works required for completing the projects shall be deemed to be included in bidder's scope irrespective of whether it is specifically mentioned or not in the tender document.
- Bidder should obtain statutory permissions from statutory bodies wherever required for execution of works.

- **Bidder shall quote for the complete system.** Partial bids or bids which do not cover the entire scope of the project will be treated as incomplete and not responsive to the terms and conditions of tender are liable to be rejected.
- Pre-bid meeting shall be the part of Tender document. Decisions taken in the pre-bid meeting will be applicable to the tender**.** Minutes of pre-bid meeting will be uploaded on web-site. Accordingly, bidders have to quote the price and submit the necessary documents with the tender.

1. Eligibility

The bidder shall provide sufficient documentary evidences to satisfy the following conditions.

- The Bidder should provide IEC certificate of SPV Module, Inverter, BOM etc. and test report from authorized test centre of MNRE, GoI.
- Shall manufacture/supply the material (Module, Inverter & Battery) only as per the standards mentioned in tender document.
- **The Bidder should have installed & commissioned at least 650 kW capacity (single or cumulative) Grid-connected roof top net metering systems.** The list of projects commissioned has to be submitted along with the tender. Self-attested copies of the Commissioning certificates and Work order / Contract / Agreement / from the Client / Owner shall be submitted.
- Is a manufacturer of SPV system or System Integrator and shall provide the test certificate of SPV system, issued by MNRE or its authorized test centres.
- He shall supply the material (PV module, Inverter, BOM etc.) as per IEC Standards mentioned in Technical Specifications.
- Bidder who has not completed 50% or more work in earlier tender (last 2 years in MEDA) shall not be eligible to apply for this tender.

For submission of the bid (Grid connected), bidder must have to fulfil following criteria.

- Must have field service setup to provide good after sale services including necessary repair and maintenance in the state of Maharashtra. Service and dealership network in Chandrapur / Nagpur division will be preferred. Accordingly, bidder has to submit the details thereof.
- Has provided goods after sale services for the works done by him during last three years.
- **Will not be having Joint venture**.
- Must have total cumulative turnover of minimum **300 Lacks** during last three years
- All above criteria shall be strictly followed. Bidder should quote only if he is eligible.

2. Standards/ Certificates

- The goods supplied and works executed under this contract shall confirm to the standards mentioned in the technical specification and where no applicable standard is mentioned, the latest version of Indian Standard Institution or Bureau of Indian Specification shall be applicable.

- The Bidder shall submit all the valid test certificates and reports of the system components following the latest MNRE Guidelines and the same components shall be supplied for which the test reports / certificates are submitted.
- The manufacturer should submit test certificate of Module.
- **For Grid connected SPV System i.e. total 227 kW capacity Grid-Connected Solar PV Power Plant under roof-top net metering at various 13 Industrial Training Institute (ITI) Buildings in Chandrapur District in the state of Maharashtra the manufacture has to give the guaranteed generation i.e. to generate 4 units per day per KWp for 320 Days at available solar radiation of Chandrapur. If system produces less generation below guaranteed generation then penalty of Rs. 10/- per unit will be charged**. **Accordingly, bidder has to quote.**

3. Instructions

- Bidder shall upload Information, Experience Certificates, Test Reports and other such relevant document's specified in the list of other important documents.
- The bidder should visit the site & carryout the survey and upload the certificate indicating that the survey is carried out by the bidder as per **Appendix - IV**. The tender submitted without site visit report will be rejected out rightly.
- The technical proposals confirming to eligibility criteria and found satisfactory will be taken up for detailed technical evaluation. A technical evaluation committee shall evaluate the Bids submitted by bidders for detailed scrutiny. During evaluation of the technical bids, MEDA may at its discretion ask the bidders for clarification of their bid.
- In case bidder does not fulfil the technical bid the financial bid shall not be opened & he shall be disqualified from further bidding process.
- Price Proposals of bidders qualifying above conditions shall be subsequently opened. The time and date of the opening of the Price bid shall be intimated on web site by MEDA.
- Bids submitted without EMD will be rejected. Bidder would need to upload the required documents through electronic mode only.
- The Bidder shall upload valid copies of
  - GST registration certificate
  - PAN and Service Tax Registration Certificate issued by appropriate authority.
  - Income Tax Returns of previous three assessment years.
- For any Clarification /online support please contact at mail id domedanagpur@mahaurja.com
- Divisional General Manager MEDA, Nagpur reserves the right
  - To reject or accept any or all tenders without assigning any reasons thereof.
  - The work order is not transferable. Subletting is not allowed.

MEDA will not entertain any claim at any stage of successful bidder on the plea that the bidder was not having sufficiently acquainted himself to the site conditions.

4. Cost of Bidding

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

5. Language of Bid

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between MEDA and the bidder shall be in English language. Supporting documents and printed literature furnished by the bidder if provided in another language it shall be accompanied by an accurate translation of the relevant passages in English language duly authenticated and certified by the bidder (exception for bidders from Maharashtra). Supporting materials, which are not translated into English, may not be considered. For the purpose of interpretation and evaluation of the Application, the English language translation shall prevail.

6. Documents Comprising the Bid

The Bid prepared by the Bidder shall be uploaded in two parts Viz. Technical and Financial bids comprising the following components. Bids shall electronically submit online in the E-tender platform and the documents shall be scanned and submitted.

Part I - Technical Proposal:

Bidder shall submit relevant certificates to fulfil the eligibility criteria prescribed in the tender document along with following documents/information.

- Bidder's Information Sheet
- Cumulative 3 year Turnover
- Self-Certification of No Barr/non-failure/blacklisted.
- Installation and Performance Credentials
- Experience for installation and commissioning of SPV power plants.
- Experience/set-up of after sales service
- Product technical specifications
- Standards maintained for various components to be used in the project
- Safety consideration for system protection
- Warranty certification of equipment's / components

The Bidder is expected to verify all instructions, forms, terms and specifications in the Tender Document. Failure to furnish all information required in the tender document will be at the Bidder's risk and may result in rejection of the bid.

Part II - Financial bid

Financial Bid shall contain:

- The bidder should quote the price as against total tender estimate as shown in the tender document.

- The price quoted in the bid will be inclusive of all taxes, duties, insurance and all incidental charges for successful design, supply, installation, commissioning along with comprehensive maintenance for five years of Solar PV Power Plants.
- Prices shall be quoted in Indian Rupees only.
- In no circumstances, escalation in the prices will be entertained.
- Financial Bid uploaded with an adjustable price quotation will be treated as non-responsive and will be rejected.
- Any Bid not in accordance with above clauses of this Section will be rejected.

EARNEST MONEY DEPOSIT (EMD), SECURITY DEPOSIT (SD) & FORFEITING OF EMD:

A) EARNEST MONEY DEPOSIT:

The Earnest Money Deposit for this project of **Rs. 1,06,739/-** should be paid online through respective portal. The Companies are eligible for EMD exemption as per GR published on 01-12-2016 by Industry, Energy and Labour department by submitting the valid documentary proof**.** No interest shall be payable on the amount of Earnest Money. It shall be retained by MEDA. EMD shall be returned to unsuccessful Bidders after acceptance of work order by successful Bidder and EMD of successful Bidder shall be returned after submission of security deposit.

B) FORFEITING OF EMD:

The EMD paid or submitted by the Bidder shall be forfeited if:

1. The Bidder withdraws his tender before finalization of work order.
2. The Bidder does not accept work order.
3. The Bidder violates any of the terms and conditions of the tender.
4. The Bidder fails to deposit requisite Security deposit.
5. The Bidder fails / refuses to execute the contract, in this case MEDA shall have full right to claim damages thereof in addition to the forfeiture of EMD.

C) SECURITY DEPOSIT:

1. The Bidder shall furnish security deposit at **3%** of the total contract value on the same day on which work order is issued by way of demand draft of nationalized bank in favour of **Maharashtra Energy Development Agency.**
2. ***Additional Security Deposit (SD) clause: -**

- If bidder quotes within the limit of -20% to +10% of the estimated tender cost, the Security Deposit (SD) of 3% of contract value is to be deposited.
- If bidder quotes below 20%, then bidder has to submit Security Deposit (SD) as mandatory 3% + additional % with respect to percentage below 20% of the total contract value. For ex. If Bidder quotes -24% then bidder has to submit 3% mandatory + 4% additional = **7% of the total** contract value as security

deposit (SD).

3. Failure to comply with the terms of security deposit shall result into cancellation of work order without any further reference to the Bidder and the EMD shall be forfeited.
4. The security deposit shall be liable to be forfeited wholly or partly at the sole discretion of the MEDA, if the Bidder either fails to execute the work of above projects or fails to fulfil the contractual obligations or fails to settle in full his dues to the MEDA.
5. In case of premature termination of the contract, the security deposit will be forfeited and the MEDA will be at liberty to recover the losses suffered by it & if additional cost is to be paid, the same shall be recovered from the Bidder.
6. The MEDA is empowered to recover from the security deposit for any sum due and for any other sum that may be fixed by the MEDA as being the amount or loss or losses or damages suffered by it due to delay in performance and / or non-performance and / or partial performance of any of the conditions of the contract and / or non-performance of guarantee obligations.
7. The security deposit shall be released to the Bidder only after contract is completed to the satisfaction of the MEDA.

7. PRICE VARIATION:

Under any circumstances & for any reasons, escalation in the contract value will not be considered by MEDA.

8. JURISDICTION:

In case of any dispute, in the documentation and during implementation, commissioning, completion and CMC period, all the matter will be resolve under Nagpur Jurisdiction only.

9. TIME FRAME:

The time frame for the completion of work is **120 Days** from the date of issue of work order.

10. Period of Validity of Bid

- Bids shall remain valid for **180 days** after the date of opening of Technical Bid. A Bid valid for a shorter period shall be rejected by MEDA as non-responsive.
- In exceptional circumstances, MEDA may solicit the Bidder's consent to extend the period of validity. The request and the responses thereto shall be made in writing. The EMD provided shall also be suitably extended. A Bidder granting the request will not be required nor permitted to modify its bid.

11. Mode of submission of bids

- The Bids shall be submitted electronically in the e-tender platform only.
- Bids sent by any other mode like in person, post, Telex or Fax or e-mail will be rejected.
- MEDA may at its discretion ask Bidder to submit the hard copy of any of the document submitted on e-tender platform.

12. Deadline for Submission of Bids

- Bids must be uploaded by the bidder through e-tender process not later than the time and date specified in the invitation for Bids.
- The MEDA may, at the discretion, extend this deadline for submission of bids by issuing an addendum, in which case all rights and obligations of MEDA and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

14. Clarification of Bids

- During evaluation of Bids, MEDA may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in prices or substances of the Bid shall be sought, offered or permitted.

14. Preliminary Examination

- The MEDA will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.
- Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between words and figures, the lower of the two will prevail. If the Bidder does not accept the correction of errors, its bid will be rejected.
- The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.
- The Bidder shall be deemed to have examined the bid document including the agreement/ contract to have obtained information on all matters whatsoever that might affect to execute the project activity and to have satisfied himself as to the adequacy of his bid. The bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labour involved etc. and as to all supplies he has to complete in accordance with the Bid document.
- Bidder is advised to submit the bid on the basis of conditions stipulated in the Bid Document.
- Bidder's standard terms and conditions if any will not be considered. The cancellation / alteration / amendment / modification in Bid documents shall not be accepted by MEDA.
- Bid not submitted as per the instructions to bidders is liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.

16. Acceptance or Rejection of Bids

- MEDA reserves the right to accept or reject any bid or all the bids and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability or any obligation to inform the affected bidder or bidders of the grounds for the said action.
- Any Bid with incomplete information is liable for rejection.

- For each category of pre-qualification criteria, the documentary evidence is to be produced duly attested by the authorized representative of the bidder and serially numbered. If the documentary proof is not submitted for any/all criteria the Bid is liable for rejection.

  If any information given by the bidder is found to be false/ fictitious, the Bidder will be debarred for 3 years from participating in any other tenders of MEDA and will be black listed.

17. Criteria for Bids evaluation

Step 1: Test of Responsiveness

- Prior to evaluation of Bids, MEDA shall determine whether each Bid is responsive to the requirements of the tender document. A Bid shall be considered responsive only if all documents as outlined in the tender document for two stage bid process are submitted as per the pre-defined format.
- The MEDA reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by MEDA in respect of such Bid.

Step 2: Bid Evaluation

Bid evaluation will be carried out considering the information furnished by Bidders as per the Tender documents. Based on technical/ qualifying criteria preferred bidders will be short listed.

Technical Evaluation

- Only Technical Proposals conforming to minimum eligibility criteria and found to be responsive will be taken up for detailed technical evaluation. A technical/ tender committee shall evaluate the Bids submitted by bidders for a detailed scrutiny. During evaluation of Bids, MEDA, may, at its discretion, ask the bidders for clarification of their Proposals.

Financial Evaluation

The price bids of the eligible bidders will then be evaluated in the manner provided below;

- At the outset, the price bids of all the Bidders who are technically qualified in technical evaluation shall be opened in the presence of the Bidders Representatives.
- The bidder's names, the Bid Prices, total amount of each bid and other details as MEDA may consider appropriate, will be announced and recorded by MEDA at the opening. The bidder's authorized representatives will be required to sign this record.
- Bidder that has quoted the lowest price (inclusive of all the taxes/duties) without breach any technical specification as per terms and condition shall be declared as the preferred Bidder.
- The work orders shall be issued to the successful bidder who ever qualifies in the complete process as mentioned above.

18. Award Criteria and Award of Contract

MEDA will award the contract to the successful bidder whose bids has been determined to be substantially responsive and has been determined as the lowest evaluated bid as per the criteria mentioned above, provided further that the bidder is determined to be qualified to perform the contract satisfactorily.

19. Corrupt or Fraudulent Practices

MEDA requires that Bidders shall observe the highest standard of ethics during the execution of contracts. In pursuance of this policy, MEDA Defines, for the purposes of this provision, the terms set forth as follows:

- "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
- "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Government, and includes collusive practice among Bidders (prior to or after tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the Government of the benefits of free and open competition;
- will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- will declare a firm ineligible for a period of 3 years, if it at any time it determines that the firm has engaged in corrupt or fraudulent practices in competing for awarded work at Government financed contract, or in executing, a contract.

20. Conditions for issuing Work Order to lowest bidder:

- If declared L1, as per financial bid evaluation, the bidder has to submit description and physical specification of materials in detail along with single line diagram of solar plant certified by Chartered Engineer which will be used in project. Also a letter of undertaking on the letter head of bidder's company mentioning similar material (with same specification and description) will be used/replicated at all awarded project sites needs to be submitted, a copy of above testimonials to be compulsorily submitted to District Office, MEDA, Chandrapur.
- The bidder has to submit documents related to labour insurance and material insurance made by him, also bidder should submit 1% charge of total contract value by demand draft at MEDA office as regards 'Labour Welfare Cess' according to the law.
- An undertaking by the bidder on Rs. 100/- stamp paper mentioning his establishment of required service stations near the project sites within jurisdiction of concerned district, names of his site Engineer / Manager & their contact phone numbers, also contact number & address of local personnel of the company who is responsible for carrying out comprehensive maintenance contract (CMC) of the project for 5 years.

21. Terms of Payment:

a. <u>Release of 80% of total project cost:</u>

It will be released after supply, installation & successful commissioning of the systems duly certified by Bidder, Officer of MEDA, Chandrapur & authorized person of Beneficiary, along with following documents:

- Joint Inspection Report duly signed by beneficiary, Bidder representative & MEDA official.
- Submission of Project Insurance policy documents effective from date of commissioning of the project for period of 05 years covering damage by natural calamities, fire, forceful damage of project, theft, etc.
- System Photograph accompanying MEDA official taken during joint inspection.
- Warranty/Guaranty Certificate of materials used in project.
- Serial Wise Test Reports of Panel comprising I-V curve and detail parameters of each panel.
- Test Report of inverter and BOM.
- Comprehensive Maintenance Contract (CMC) document as per clause mentioned in section IV "Technical Specification of SPV Solar Plant" for 5 years on the letter head of bidder.
- RFID Reader must be carried at the time of inspection. The report generated from RFID Tag of each panel is to be attached.

b. <u>Release of 20% of total project cost:</u>

It shall be released on receipt of three-month successful performance report in prescribed format day/date wise generated automatically through Remote Real Time Monitoring System. If the generated units are found below expected 4 units (KWh) per KWp per day from SPV power plant then penalty of Rs.10 /unit will be levied.

- Submission of Performance Bank Guarantee of 10% of total project cost from any Nationalized Bank in favour of Maharashtra Energy Development Agency valid for 5 years.
- **Guaranteed Generation**: Before release of payment, a guaranteed generation during this three-month operation period will be verified.

A guaranteed automatic generation report in day/date wise format of minimum 4 units (KWh) or kW/day from SPV power project is expected for a period of 5 years, if the total generation pertaining to this period (initial three months) observed to be less, then penalty of **Rs.10/-** unit will be levied and the supplier/bidder will have to pay penalty amount in the form of D.D. Payable to Maharashtra Energy Development Agency.

After completion of one-year period from the date of installation of the project, total generated units will be counted and if those units are found less, necessary penalty as mentioned above will be levied. The penalty amount will be paid to the beneficiary in the form of Demand draft. However, if the generated units are above than expected (minimum 4 units (KWh)) per KWp per day from SPV power plant calculated for 320 days in a year, then, in such case, the penalty amount paid by the supplier/bidder will be refunded to the concerned by MEDA.

For rest of the years till expiry of CMC period i.e. up to 5 years, necessary bank guarantee submitted by the bidder will be considered to take care of active guaranteed generation of the project which will be

expected as 4 units (KWh) or KW/day. If generation in these years found to be less, then penalty will be levied as Rs.10/- unit.

Deduction: -

i. The TDS at the source will be deducted as per the Govt. rule and regulations.

ii. MEDA will issue necessary certificates of TDS deduction

iii. 'C' / 'D' form will not issue by MEDA.

iv. Note that if bidder does not provide insurance against Labour and Material MEDA will process insurance at "Director of Insurance" and will deduct 1% of contract value against insurance claimed by them and 1% of contract value deduction against "Labour Welfare Cess" from payment towards successful bidder.

22. PROJECT TIMELINES:

- The time frame for the completion of work is **120 Days** from the date of issue of work order.

Sr. No.	Description	Timeline <Insert dates>
1.	Issuance of Letter of Award	Zero date
2.	Signing of Agreement with respective beneficiary authority.	Zero date
3.	Registration of Solar Power Project with MEDA	Zero date
4.	Installation of Solar Power Projects at all sites	within 90 calendar days after Issuance of Letter of Award
5.	Commissioning and Acceptance of Solar Power Project	within 120 calendar days after Issuance of Letter of Award

Bidder should follow the project timelines and also bound to complete the progress of project work as per given below mild stones or else he will be liable for Penalty against incomplete milestone.

Sr. No.	Milestone	Work Status
1	In 60 days	> 50% Completion of work
2	In 90 days	> 80% Completion of work
3	In 120 days	Commissioning and Acceptance of Solar power projects

23. TIME EXTENSION

- Only 07 days extension will be given in extreme condition, the rights of decision for granting time extension will be reserved by MEDA. For further extension of time, penalty of 1/2% of total project cost per week will be levied on the awarded bidder and maximum upto 10%.
- From date of issue of work order, every 07 day's report of work progression needs to be submitted to MEDA. The review of work progression will be taken and necessary altercation can be suggested, delay in work progression or failure to fulfil required altercation may lead to cancellation of work order. The rights for decision will be reserved by MEDA.

24. PENALTY CLAUSE

If the systems are not installed and commissioned within the stipulated period as mentioned in the work order the Bidder shall be required to pay penalty of 1/2% (half percent) of total amount per week, maximum up to 10% of the total cost of the systems and the amount shall be recovered either from the amount due to the Bidder or from Security Deposit.

If Successful bidder is not able to complete the project in due time the same shall be got done through other contractor and the Successful bidder has to bear all the cost incurred against the balance work left by him for the completion of project.

SECTION – III

GENERAL CONDITIONS OF CONTRACT (GCC)

1. General Terms and Conditions:

The following are the General Terms and Conditions of Contract for Supply, Installation and commissioning of SPV Power Plant, as per the specifications given in the document.

a) Bidder shall be responsible for any damage occurred, if any, at the site during the execution of work.

b) The Bidder should provide appropriate tools and equipment's to the workmen and ensure that those are in proper working condition and the workmen use the appropriate tools and take precaution "please note that any accident to the work men/ public/ animals/ property both movable and immovable shall be entire and sole responsibility of the bidder and any proceeding arrising out of the same shall be at the bidder's risk and cost, Maharashtra energy development agency (meda) or its employees will not be responsible for any such incident".

c) Bidder should provide necessary manufacture's test certificates for materials being used for the work. Power curve of all the panels erected by manufacturers shall be provided to the MEDA Divisional Office / Divisional Office Nagpur and District Office Chandrapur.

d) The selected Bidder is bound to work on the guideline provided by MEDA from time to time. Guidelines if issued in future by MEDA, the changes proposed will also be applicable without augmentation in project cost till the completion of 5 years CMC period.

e) The Bidder shall carry out the work strictly according to the specifications as per given in Section-IV and complete the work within stipulated time.

f) It is the responsibility of Bidder to submit the reports for systems installed & commissioned and certificates for undertaking the responsibility of maintenance of the systems to MEDA with a copy to Beneficiary. Bidder shall also impart training to the user for regular Operation & Maintenance of the systems and certificate in this respect should be submitted.

g) Bidders should give Guarantee against any manufacturing defects from the date of commissioning up to CMC period. For any manufacturing defects, supplier shall replace defective parts at free of cost during the CMC period and shall keep the system functional.

h) MEDA officials will do inspection as and when necessary, during the execution of work and thereafter subsequent to installation and commissioning of the work for the purpose of issuing final completion certificate.

i) In the event of any discrepancy observed in specifications, the specifications given by MEDA will be final. In the event of dispute arising any time, related to this work and document, decision of the Divisional Director, MEDA, Nagpur or his nominee shall be final.

j) MEDA at its discretion may visit supplier's factory for testing/ inspection at any time during the period of supply and installation of the systems.

k) MEDA will not pay any interest on any amount, due to the Bidders.

l) During the inspection, if any deviations in Technical Specifications are observed, MEDA reserves right to test any solar module/ system at any authorized test centre of MNRE. Bidder shall provide the facilities for getting the sample tested & the supplier shall bear the cost for the same.

m) If the supplier fails to complete the work or partially completes it then, MEDA reserve right to cancel the work order and get it done from other supplier and any loss due to this shall be recovered either from any amount due to the supplier or from his Security Deposit.

n) At the time of inspection of MEDA, manufacturer or supplier has to submit the I.V. curves and test reports of supplied PV modules to respective officer.

o) The Wiring must be carried out in casing-capping/ conduit which are suitable as per site condition.

p) **In case of increasing/ decreasing the sanctioned electric load at the project site for its proportionate matching for net metering system, it will be responsibility of successful Bidder/ Manufacturer to apply for additional electric load if any, under the signature of concerned beneficiary and get the work done from MSEDCL before installation of net meter at the project site. The concerned Bidder/ Manufacturer can start this activity parallel while initiating the project activities at site. The cost incurred for the same (additional Security Deposit, Payment if any) has to be borne by bidder.**

q) **It will be responsibility of the Bidder for procurement and installation of Net Meter/ HT meter and its required accessories in the system.**

r) **It will be responsibility of the bidder to provide required Wi-Fi system through any network for real time monitoring of the system using internet and data for initial 1-year period, latter the bidder/supplier may handover the Wi-Fi system to the beneficiary for its maintenance.**

s) It will be responsibility of the Bidder to ensure the satisfactory performance of the system.

t) The Bidder shall provide the display board of size 3ft x 3ft that gives detailed information of system along with the contact details of manufacturer. This will help the beneficiary during 5 years CMC period.

u) The Bidder shall comply with the provision of contract labour (Regulation and Abolition) Act 1970, minimum wages Act 1948, payment of the wages Act 1963 Workmen's Compensation Act 1961, the contract labour (Regulation and Abolition) Act 1979 and all other related Acts and any modification there of or any law relating thereto and rules made there under from time to time.

v) If previous performance of any Bidder found unsatisfactory, he will be disqualified.

w) If any information/ confirmation on any point of these tender conditions are required Bidder may contact/ write to Divisional General Manager(Divisional Office MEDA, Nagpur) giving tender reference no. etc.

x) In the event of dispute during installation & commissioning of the systems related to the work and documents, decision of the Divisional General Manager(Divisional Office, Nagpur) MEDA shall be final.

y) The Divisional General ManagerMEDA, Nagpur reserves the right to distribute the work among the Bidders who are eligible and have submitted the offers.

z) Once the Bidder submit his offer and subsequently if not interested to work, in such case MEDA will forfeit his EMD amount.

aa) At the time of placing work order and during the implementation MEDA can revise the Technical terms and conditions if revised by MNRE, which will be binding on the Bidder.

bb) The Divisional General ManagerMEDA, Nagpur reserves the right to select L2 Bidder i.e. second lowest Bidder to complete the work, if L1 i.e. lowest Bidder fails to fulfil tender conditions or fails to complete the work.

cc) It is binding on the successful Bidder to submit original certificates, documents required by MEDA.

2. Communications:

- Wherever provision is made for the giving or issue of any notice, instruction, consent, approval, certificate or determination by any person, unless otherwise specified such communication shall be in writing and shall not be unreasonably withheld or delayed.

- Project review coordination meetings between the Beneficiary, MEDA's Representative and Contractor shall be conducted on a regular basis or as and when required by the MEDA, at locations decided by the MEDA, for Contractor's progress and plans for completing the remaining Works, to deal with matters affecting the progress of the Works, and to decide on responsibility for actions required to be taken. Decisions taken and instructions issued during the coordination meetings, as recorded in the Minutes, shall have the same force and effect as if they were written communications issued in this accordance.

Estimate for Grid Connected Solar Photovoltaic Power Plant At 13 Various Govt. ITI Buildings in Chandrapur District.

Sr. No.	Name of the Institute	Capacity	Estimate cost (Rs. in Lakhs)
1	**Government Girls Industrial Training Institute, Chandrapur.**	10 kW	4,09,910/-
	Net Metering Cost (Consumer No. :- 450010363794 B.U. :- 2160)		14,200/-
2	**Government Girls Industrial Training Institute (COEC Building), Chandrapur**	15 kW	5,73,540/-
	Net Metering Cost (Consumer No. :- 450011393638 B.U. :- 2160)		40,000/-

3	**Government Industrial Training Institute, Chandrapur**	55 kW	21,02,980/-
	Net Metering Cost (Consumer No. :- 450019000261 B.U. :- 2160) HT- Netmetering		1,32,500/-
4	**Government Industrial Training Institute, Bhadrawati**	5 kW	2,04,9550/-
	Net Metering Cost (Consumer No. :- 458030133834 B.U. :- 2186)		14,200/-
5	**Government Industrial Training Institute, Warora**	15 kW	5,73,540/-
	Net Metering Cost (Consumer No. :- 458010053940 B.U. :- 2178)		40,000/-
6	**Government Industrial Training Institute, Bramhapuri**	15 kW	5,73,540/-
	Net Metering Cost (Consumer No. :- 463420004087 B.U. :- 4331)		40,000/-
7	**Government Industrial Training Institute, Saoli**	10 kW	4,09,910/-
	Net Metering Cost (Consumer No. :- 452773020408 B.U. :- 4832)		14,200/-
8	**Government Industrial Training Institute, Rajura**	40 kW	15,29,440/-
	Net Metering Cost (Consumer No. :- 456539100260 B.U. :- 4328)		1,35,500/-
9	**Government Industrial Training Institute, Gondpipari**	15 kW	5,73,540/-
	Net Metering Cost (Consumer No. :- 452120800459 B.U. :- 4329)		40,000/-
10	**Government Industrial Training Institute, Ballarpur**	15 kW	5,73,540/-
	Net Metering Cost (Consumer No. :- 450473320423 B.U. :- 2127)		40,000/-
11	**Government Industrial Training Institute, Mul**	12 kW	4,58,832/-
	Net Metering Cost (Consumer No. :- 452023005024 B.U. :- 4335)		40,000/-
12	**Government Industrial Training Institute, Pombhurna**	10 kW	4,09,910/-
	Net Metering Cost (Consumer No. :- 469640013158 B.U. :- 4833)		14,200/-

13	**Government Industrial Training Institute, Nagbhid**	10 kW	4,09,910/-
	Net Metering Cost (Consumer No. :- 463610108831 B.U. :- 4336)		14,200/-
	Total		93,79,547/-
	GST (13.8%)		12,94,377 /-
	Grand Total		**1,06,73,924/-**

- **The total estimated cost for the system is Rs. 1,06,73,924 /-. Hence bidder has to submit the on line EMD amount Rs. 106739/-**
- Government of Maharashtra, Industries, Energy and labour department Government resolution no. भांखस-2014/प्र.क्र.82/भाग-3/उद्योग-4 दि.30/10/2015 and ''शासन निर्णय क्रमांक : क्र. निविदा - 2012/प्र.क्र. 97 /पंरा- 7 दिनांक 23 सप्टेंबर 2013 is applicable to this tender.

3. Manner of Execution:

Execution of work shall be carried out in the approved manner as outlined in the Technical specifications or where not outlined, in accordance with relevant MNRE/ MEDA/ BIS/ Indian Standard Specifications, to the reasonable satisfaction of The Employer.

- The Contractor/ Agency should successfully complete the project within timeframe set out by the employer and mutually agreed between Contractor/ Agency and Employer.
- MEDA shall not be responsible for any loss or damage of any material when installing SPV power plants.
- Undertake necessary activities during the warranty period as set out in this Contract.
- It is the responsibility of successful bidder to make the insurance of SPV system from the date of commissioning up to the Completion of CMC period by following standard procedure.

4. Application:

These General Conditions shall apply to the extent that they are not superseded by provisions in other parts of the contract.

5. Standards:

The design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/ Indian Standards and as detailed in the technical specifications Section as per the MNRE/ MEDA requirements of the bid document and Annexure - A. The goods supplied under this contract shall confirm to the Standards mentioned, where appropriate Standards and Codes are not available, other suitable standards and codes as approved by the authoritative Indian Standards shall be used.

6. Inspection:

- The projects will be inspected for quality at any time during commissioning or after the completion of the project by MEDA Officials
- Bidder shall inform MEDA, District Office, Chandrapur in writing when any portion of the work is ready for inspection (site wise) giving sufficient notice to enable MEDA to depute officials to inspect the same without affecting the further progress of the work. The work shall not be considered in accordance with the terms of the contract until the competent person from MEDA certifies in writing to that effect.
- The cost of Inspection shall be borne by Bidder only.
- Bidder has to strictly follow the specifications given in the work order while carrying out the execution of work. During inspection if it is found that Bidder has deviated from the specifications, Bidder has to do the alteration/ modification/ reconstructions as per the given specifications at his own cost & risk.

7. Transportation:

Where the Contractor/ Agency is required under the contract to transport the goods to specified locations defined as Project sites, transport to such places including insurance, as shall be specified in the contract, shall be arranged by the Contractor/ Agency, and the contract price shall include transportation costs.

8. Assignment:

The Contractor/ Agency shall not assign, in whole or in part to any third party, its obligations to perform under the contract, except with MEDA's prior written consent.

9. Sub-Contracts:

Subcontract is strictly prohibited.

10. Termination for Default:

MEDA without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor/ Agency, terminate the contract in whole or part:

- If the Contractor/ Agency fails to deliver any or all the goods within the period(s) or within any extension thereof granted by the MEDA or
- If the Contractor/ Agency, in the judgment of MEDA has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

In the event MEDA terminates the contract in whole or in part, MEDA may procure, upon such terms and in such manner as it deems. Appropriate goods or services similar to those undelivered and the Contractor/ Agency shall be liable to MEDA for any excess costs for such similar goods or services. However, the Contractor/ Agency shall continue the performance of the contract to the extent not terminated.

11. Applicable Law:

The contract shall be interpreted in accordance with the laws of the Union of India.

12. Notices:

Any notice given by one party to the other pursuant to this contract shall be sent to other party in writing or by cable, telex or facsimile and confirmed in writing to the other party's address specified. A notice shall be effective when delivered or on the notice's effective date, whichever is later.

13. Packing:

- The Bidder shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the contract.
- The packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures during transit and open storage.
- Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods final destination and the absence of heavy handlings facilities at all points in transit.
- The packing, marking and documentation within and outside the item shall comply strictly with such special requirements as shall be provided for in the contract including additional requirements, if any and in any subsequent instructions ordered by the MEDA.

14. Danger plates:

The bidder shall provide at least 8 Danger Notice Plates at each project site near inverter and solar panel of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enamelled white on both sides and with inscription in signal red colour on front side as required. The inscription shall be in English and local language.

15. Insurance:

- The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O & M period, if required.
- The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/ material/ equipment/ properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.
- The bidder shall provide insurance coverage ex-factory until commissioning and acceptance for replacement or repair of any part of the consignment due to damage or loss.

16. Warranties and Guarantees:

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of 5 years from the date of commissioning of project. The successful bidder has to transfer all the Guarantees/ Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be joint responsibility of the Successful bidder and the owner of the project and MEDA will not be responsible in any way for any claims whatsoever on account of the above.

Undertaking

(On Rs.100/- Stamp Paper)

I _____ Age_____years, Occup- _____, Address _____, the (authorized signatory) of M/s. …… (Company) hereby state that, I/ my company is intending to participate for tender no. for total 227 kw capacity grid-connected solar pv power plant under roof – top net metering at various 13 iti buildings in Chandrapur district in the state of Maharashtra.

I have read all the terms & conditions mentioned in the Tender document of the MEDA. I hereby further undertake and declare that all the terms & conditions mentioned in each and every page of the said tender document along with the clarifications released, if any, are binding on me/ my company and I am fully aware that, in case of breach of any term or condition of the said Tender document, I am/ my company is liable to be disqualified from the said tender process.

Sign:

Name of authorized Signatory:

Name of Company with Stamp:

Format: Commitment from the Tenderer

(On Rs.100/- Stamp Paper)

We here by confirm that the from propose **total 227 kw** capacity grid-connected solar PV power plant under roof – top net metering at Various 13 ITI buildings in Chandrapur District in the state of Maharashtra.

We will provide the assured generation of _____ units per month at energy meter in control cabin/ room as certified by joint meter reading of manufacturer's representative and user's representative.

However for 5 years we hereby commit to pay an amount of Rs. 6/- per unit as compensation to Respective Industrial training Institute.

Date :

Place : Signature of the Tenderer

Seal

(To be submitted on Rs. 100/- stamp paper)

Affidavit

I..... (Name) has done the project of.....KW for (Beneficiary Name), Tender No ……hereby declare that the above mentioned project is commissioned by abiding following:

The standards and norms set by Ministry of New and Renewable Energy (MNRE) is maintained while installation of project.

The project has been installed under the supervision of electrical contractor/ supervisor, the electrical parameters involved in the project have been considered under supervision of electrical contractor/ supervisor.

All electrical norms are followed, electrical safety measures are taken in consideration and the project is electrically safe. Electrical contractor/ supervisor has authorized the electrical safety measures and norms.

The mechanical safety norms while designing and installation of structure are strictly followed. The solar hot dip structure is tested, approved from engineer and is capable of bearing the load of solar panels, withstand natural parameters (wind, rain) over the duration of project life.

The Rooftop where plant is capable of bearing the load of hot dip galvanised structure and solar panel over the period of project life.

I will be responsible for maintenance of the project over the period of Comprehensive Maintenance Contract (CMC) i.e., 5 years and for the remaining 20 years the beneficiary is responsible for undertaking the maintenance work of the project.

In case of any mishap from the solar project with the parameter mentioned above, I will be responsible. I hereby undertake for the above.

Sign of Project Developer: .....

Stamp: .....

Beneficiary Name: .....

Address: .....

.....

SECTION-IV

TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION OF SPV POWER PLANT

Definition:

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

General System:

1. The operating life of the plants shall be minimum 25 years.
2. The plant shall feed AC power to the Low Tension (LT)/ High Tension (HT) distribution grid power supply through adjacent substation.
3. The plants shall monitor solar generated energy using plant DC/ AC energy meter/ Bidirectional energy meter independent of load energy monitoring. Remote monitoring facility must be made available.
4. The plant shall consist of PV array, fixed PV array support structure, String/Array combiner boxes, DC cabling, DC distribution box, Inverter, AC cabling, AC distribution box, plant AC energy meter, load energy meter and data acquisition system.
5. The individual Solar PV array shall be installed on Rooftop using **fixed PV array support structure.**
6. The individual string/ array combiner boxes and DC cabling shall be installed on suitable place
7. The inverter shall be installed in the control room
8. The DC and AC distribution boxes, DC and AC cabling, energy meters and data acquisition system shall be installed in the control room/ open space provided in (or near) the building.
9. **If SPD is already inbuilt in inverter but then also bidders need to install extra SPD & MCB in ACDB & DCDB**.
10. **PV Array**

The total solar PV array capacity should not be less than respective locations Capacity as per list comprise of solar polycrystalline modules with minimum capacity of 325W and above wattage. Module capacity less than minimum 335Wp should not be supplied. The module type must be qualified as per IEC 61215 latest edition for polycrystalline silicon or IEC 61646 for other latest technology. SPV module conversion efficiency should be equal to or greater than 16% under STC. Modules must qualify to IEC 61730 Part I and II for safety qualification testing. Certificate for module qualification from IEC or equivalent should be uploaded. Self-undertaking must be submitted from manufacturer/ supplier that the modules being supplied are as per above.

1. The PV modules used should be made in India.
2. The peak power rating of the Solar PV array under Standard Temperature Conditions (STC) shall be equal to the peak power rating of the plant.
3. The PV array shall consist of framed multi-crystalline.
4. Individual PV modules rating should be of minimum 325Wp at STC.
5. The rated maximum power rating of PV modules should have positive tolerance in range of 0 to +3% and negative temperature co-efficient of power for PV modules should be less than or equal to 0.45% per degree C. The peak power point voltage and the peak-power point current of any supplied module and / or any module string (series connected modules) shall not vary more than 3 (three) percent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
6. A suitable number of Solar PV modules shall be connected in a series string. A suitable number of series strings shall be connected in parallel to formulate a series parallel array.
7. The PV Array shall be designed to match the inverter input specifications.
8. The module shall be provided with junction box with provision of min. 3 Nos. of by-pass diodes and external MC4 type or equivalent plug-in connectors. The junction box should have hinged, weatherproof lid with captive screws and cable gland entry points & should be IP 65 rated.
9. The front surface of the module shall consist of impact resistant, low iron and high transmission toughened glass.
10. The module frame shall be made of corrosion resistant material electrically compatible with structural material used for mounting the modules.
11. Each PV module manufactured in India must have RF identification tag (RFID) compatible with MNRE requirements (Traceability requirement).
12. DC negative conductor shall be bonded to the ground via Ground Fault Detector Interrupter (GFDI). The grounding point shall be as close as possible to the PV Array.
13. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP65 rated.
14. Necessary I-V curves at 25^0C, 45^0C, 60^0C and at NOC are required to be furnished. Offers to provide PV module warranty of 25 years with not more than 20% degradation in performance/output over 25 years.
15. The PV module must have 10 years free replacement guarantee against material defect or craftsmanship.
16. Name of the manufacturer of PV module; name and manufacturer of the solar cell; month and year of manufacture; I-V curve, wattage, Im, Vm, FF for the module; unique serial no & model no; date & year of obtaining IEC PV module qualification certificate are required to be furnished.

Warranties:

Material Warranty:

i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (05) years from the date of sale to the original customer ("Customer")
ii. Defects and/or failures due to manufacturing
iii. Defects and/or failures due to quality of materials
iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option.

Performance Warranty:

The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25 year period and not more than 10% after ten years period of the full rated original output.

PV MODULES:

a) The PV modules must confirm to the latest edition of any of the following / equivalent BIS Standards for PV module design qualification and type approval:
   - Crystalline Silicon Terrestrial PV Modules IEC 61215 / IS14286

b) In addition, the modules must conform to IEC 61730 Part 1-requirements for construction & Part 2 - requirements for testing, for safety qualification.

Identification and Traceability:

Each PV module must use a RF identification tag (RFID), which must contain the following information:

(i) Name of the manufacturer of PV Module
(ii) Name of the Manufacturer of Solar cells
(iii) Month and year of the manufacture (separately for solar cells and module)
(iv) Country of origin (separately for solar cells and module)
(v) I-V curve for the module
(vi) Peak Wattage, Im, Vm and FF for the module
(vii) Unique Serial No and Model No of the module
(viii) Date and year of obtaining IEC PV module qualification certificate
(ix) Name of the test lab issuing IEC certificate
(x) Other relevant information on traceability of solar cells and module as per ISO 9000 series.

It shall be noted that from 1st April 2013 onwards; RFID is mandatory placed inside the module laminate.

Inverter:

The PCU required shall be as per the requirement of **Respective plant capacity** to convey DC power produced by SPV modules into AC power and adjust the voltage & frequency levels to meet the local grid conditions.

Common Technical Specification:

Control Type: Voltage source, microprocessor assisted, output regulation.

Output voltage: 3 phase, 415 V AC (+12.5%, -20% V AC)

Frequency: 50 Hz (+3 Hz, -3 Hz)

Continuous rating: As per site specification

Normal Power: As per site specification

Total Harmonic Distortion: less than 3%

Operating temperature Range: 0 to 55 deg C

Humidity: 95 % Non-condensing

Housing cabinet: PCU to be housed in suitable switch cabinet, IP-20(Minimum) for indoor IP-65(Minimum) for outdoor

PCU efficiency: 98% and above at full load.

PF: > 0.9

Other important Features/ Protections of PCU:

1. Mains (Grid) over-under voltage and frequency protection.
2. Over load capacity (for 10 sec) should be 200% of continuous rating.
3. The PCU shall be self-commuted and shall utilize a circuit topology and components suitable for meeting the specifications listed above at high conversion efficiency and with high reliability.
4. The PCU shall be provided with MPPT (Maximum Power Point Tracing) features, so that maximum possible power can be obtained from the PV module.
5. The PCU shall be self-commuted and shall utilize a circuit topology/ DSP technology to meet the specifications listed above at high conversion efficiency and with high reliability. The PCU shall by Hybrid One and shall give the preference to feed the Loads from Solar Energy being produced and shall draw the additional power from mains to meet the load requirements in the case load is more than solar energy being produced. Conversely it should feed the solar power to the Grid if the load is less than the solar energy generated.
6. Full proof protection against grid islanding which ensures that the PV power and the grid power get disconnected immediately in the event of grid failure.
7. The power conditioning units/ inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/ IS 61683 and IEC 60068 - 2(1,2,14,30)/ Equivalent BIS Std.
8. The charge controller (if any)/ MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/ Equivalent BIS std. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54

(indoor) and as per IEC 529 specifications.

9. The PCU/ inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing - calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.
10. The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line-to-ground fault currents.
11. The PCU shall be able to withstand an unbalanced output load to the extent of 50%.
12. The PCU shall go to the shutdown/ standby mode with its contacts open under the following conditions before attempting and automatic restart after an appropriate time delay in insufficient solar power output.
13. (a) Utility-Grid Over or Under Voltage

    The PCU shall restart after an over or under voltage shutdown when the utility grid voltage has returned to within limits for a minimum of two minutes.

    (b) Utility-Grid Over or Under Frequency

    The PCU shall restart after an over or under frequency shutdown when the utility grid voltage has returned to the within limits for minimum of two minutes. The permissible level of under/ over voltage and under/ over grid frequency is to be specified by the tenderer.

    (c) The PCU shall not produce Electromagnetic interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the PCU is housed.
14. Communication Modbus protocol with LAN/ WAN options along with remote access facility and SCADA package with latest monitoring systems.
15. The inverter with MPPT shall be used with the power plant.
16. The sine wave output of the inverter shall be suitable for connecting to 415V/230 V, 3 phase /1 phase AC LT voltage grid.
17. The inverter shall incorporate transformer isolated output (transformer-less inverters shall be used with suitable external transformers), grid islanding protection disconnection of grid & PV power in case of failure of Grid supply suitable DC/ AC fuses/ circuit breakers and voltage surge protection. Fuses used in the DC circuit shall be DC rated.
18. The inverter shall have internal protection against any sustained faults and/ or lightening in DC and mains AC grid circuits.
19. The peak inverter efficiency inclusive of built-in isolation transformer shall exceed 94%. (Typical commercial inverter efficiency normally more than 97%, and transformer efficiency is normally more than 97%)
20. The KVA ratings of inverter should be chosen as per the PV system wattage.
21. The output power factor should be of suitable range to supply or sink reactive power.
22. Inverter shall provide remote monitoring of inverter parameters should also be available.
23. The inverter shall include adequate internal cooling arrangements (exhaust fan and ducting) for

operation in a non-AC environment.

Factory Testing:

1. The PCU shall be tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service, prior to its shipment.
2. Operation of all controls, protective and instrumentation circuits shall be demonstrated by direct test if feasible or by simulation operation conditions for all parameters that cannot be directly tested.
3. Special attention shall be given to demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.
4. Operation of start-up, disconnect and shutdown controls shall also be tested and demonstrate. Stable operation of the PCU and response to control signals shall also be tested and demonstrated.
5. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other necessary tests/ simulation required and requested by the Purchasers Engineers. Tests may be performed at 25%, 30%, 75% & 100% of the rated nominal power.
6. A Factory Test Report (FTR) shall be supplied with the unit after all tests. The FTR shall include detailed description of all parameters tested qualified and warranted.

Protections:

Lightning Protections:

The SPV power plants shall be provided with lightning & over voltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. the entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per NFC 17-102:2011 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

Surge Protection:

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

Earthing;

1. PV array, DC equipment, Inverter, AC equipment and distribution wiring shall be earthed as per IS: 3043 - 1987.
2. Equipment grounding (Earthing) shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV panel mounting structures in one long run. The grounding wire should not be switched, fused or interrupted.
3. The complete earthing system shall be electrically connected to provide return to earth from all

equipment independent of mechanical connection.

4. The equipment grounding wire shall be connected to PV power plant.
5. A separate grounding electrode shall be installed using earth pit per power plant. Test point shall be provided for each pit.
6. An earth bus and a test point shall be provided inside each control room.
7. Earthing system design should be as per the standard practices.

Cables & Wires:

Cabling in the yard and control room: Cabling in the yard shall be carried out as per IE Rules. All other cabling above ground should be suitably mounted on cable trays with proper covers.

- Wires: Only FRLS copper wires of appropriate size and of reputed make shall have to be used.
- Cables Ends: All connections are to be made through suitable cable/ lug/ terminals; crimped properly & with use of Cable Glands.
- Cable Marking: All cable/ wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. Any change in cabling schedule/ sizes if desired by the bidder/ supplier be got approved after citing appropriate reasons, All cable schedules/ layout drawings have to be got approved from the purchaser prior to installation. All cable tests and measurement methods should confirm to IEC 60189.

Electrical Safety, Earthing Protection:

Electrical Safety:

- Internal Faults: In built protection for internal faults including excess temperature, commutation failure, over load and cooling fan failure (if fitted) is obligatory.
- Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations and internal faults in the power conditioner, operational errors and switching transients.
- Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.
- Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in GL trays with covers for protection.
- Fast acting semiconductor type current limiting fuses at the main bus bar to protect from the grid short circuit contribution.
- The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- The PCU shall include ground lugs for equipment and PV array grounding.
- All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years design life of the unit.

- The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU intact under all conditions in the room where it will be housed. The INVERTER shall be located indoor and should be either wall/ pad mounted. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.
- Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.
- All doors, covers, panels and cable exits shall be gasket or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings no larger than 0.95 cm. (about 3x8 inch).
- In the design and fabrication of the PCU the site temperature (5° to 55°C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

Earthing Protection:

Each array structure of the PV yard should be grounded properly. In addition the lighting arrester/ masts should also be provided inside the array field. Provision should be kept be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/ shielding of the plant should be thoroughly grounded in accordance with Indian electricity Act/ IE Rules. Earth resistance should be tested in presence of the representative of NRHM after earthing by calibrated earth tester. PCU ACDB & DCDB should be earthed properly.

Danger boards should be provided as and where necessary as per IE Act/ IE rules as amended up to date. Three signage shall be provided one each at control room, solar array area and main entry from administrative block.

Balance of Systems (BoS):

1. String/ Array combiner boxes shall incorporate DC string circuit breakers, DC array disconnect switch, lightning and over voltage protectors, any other protection equipment, screw type terminal strips and strain-relief cable glands.
2. All DC and AC cables shall be terminated using suitable crimped cable lugs/ sockets and screw type terminal strips. No soldered cable termination shall be accepted.
3. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted.
4. Suitable Ground Fault Detector Interrupter (GFDI) shall be incorporated either with the inverter or with the array combiner box.
5. String/ Array combiner boxes shall be secured onto walls or metal structures erected separately on the terrace.
6. Conduits/ concealed cable trays shall be provided for all DC cabling on suitable place. Conduits/ concealed cable trays shall be adequately secured onto the roof top/ wall.
7. The AC cable type shall be PVC/ XLPE insulated, suitably armoured, 1100V grade multi-stranded

copper conductor. Appropriate colour coding shall be used.

8. For the DC cabling, XLPE or, XLPO insulated and sheathed, UV-stabilized single core multi-stranded flexible copper cables shall be used; Multi-core cables shall not be used.
9. The DC and AC cables of adequate electrical voltage and current ratings shall be also rated for 'in conduit wet and outdoor use'.
10. The total DC cable losses shall be maximum 2% of the plant rated DC capacity over the specified ambient temperature range.
11. The DC and AC cable size shall be selected to maintain losses within specified limits over the entire lengths of the cables.
12. DC cables from array combiner box on the location to DC distribution box in the control room and DC/ AC cabling between inverter and distribution boxes shall be laid inside cable duct where available or secured with conduits/ concealed cable trays where duct is not available.
13. The DC and AC distribution boxes shall be wall mounted inside control room/ open space.
14. DC distribution box shall incorporate DC disconnect switch, lightening surge protectors, any other protection equipment, screw type terminal strips and strain-relief cable glands.
15. AC distribution box shall incorporate AC circuit breaker, surge voltage protectors, any other protection equipment, plant energy meter, screw type terminal strips and strain-relief cable glands.
16. The total AC cable losses shall be maximum 1% of the plant AC output over the specified ambient temperature range.
17. All cable conduits shall be GI/ HDPE type.
18. All cable trays shall be powder coated steel or GI or equivalent.

Civil:

1. For structural purpose, the panels plus support system that works as a distortion-free integral structural unit.
2. The panel assembly should at most 5m x 5m in plan area. The max height of panel above roof surface does not exceed 1.2 m.
3. The vertical projection area of the longer side of the panels does not exceed W/100 in sq. m where W is the gross load of the panel assembly in kg (weight of panels, connections, frames, bracings, pedestals, wiring, circuitry etc.).
4. PV array shall be installed in the space free from any obstruction and/ or shadow.
5. Drainage and roof treatment should not affected by the installation.
6. PV array shall be installed utilizing maximum space to minimize effects of shadows due to adjacent PV panel rows. The gross weight of the panel assembly should at most 45 kg/sq. m (W divided by the plan area).
7. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection ease of installation, replacement, cleaning of panels and electrical maintenance. There is at least 1m clear spacing all around the panel assembly (panel edge to panel edge between

assemblies, and panel edge to parapet wall/ room on sides).

8. The maximum column spacing should be 8.5 m c/c or less. The pedestal is placed directly on the roof, over existing roof treatment, without making any structural connection to the roof surface.
9. The panel assembly should have at least 4 pedestal supports. The minimum spacing between pedestals is 2.0 m c/c in any direction. Each pedestal is made of cement concrete. Each pedestal can transmit at most 200 kg load on roof. The plan dimension of pedestal does not exceed 450mm x 450 mm, and height does not exceed 300mm.
10. Ample clearance shall be provided in the layout of the inverter and DC/ AC distribution boxes for adequate cooling and ease of maintenance.
11. The Supplier will supply and install required size of Water Tank, pump, pipe etc. for cleaning the PV modules.
12. The supplier shall specify installation details of the PV Panel assembly with appropriate diagrams and drawings. Such details shall include, but not limited to, the following;
    a) Determination of true south at the site;
    b) Array tilt angle to the horizontal, with permitted tolerance;
    c) Details with drawings for fixing the modules;
    d) Details with drawings of fixing the junction/terminal boxes;
    e) Interconnection details inside the junction/terminal boxes;
    f) Structure installation details and drawings;
    g) Electrical grounding (earthing);
    h) Inter-panel/ Inter-row distances with allowed tolerances; and
    i) Safety precautions to be taken.

    The array structure shall support SPV modules at a given orientation and absorb and transfer the mechanical loads to the roof top columns properly. All nuts and bolts shall be of very good quality stainless steel. The panel support and panel-to-support connection both must be designed by vendor to withstand adequately high wind forces. Civil Works permission does not guarantee safety against flying/falling panels in the event of a storm or any other accident.

Mechanical:

1. PV panel assembly may consist of different number of modules with maximum of 10 PV modules.
2. Each panel assembly shall incorporate one bird repellent spike at a level higher than the panel upper edge. The location of the spike should be selected for minimum shadow effect.
3. Support structure of panel assembly shall be fabricated using corrosion resistant GI or anodized aluminium or equivalent metal sections.
4. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.
5. The support structure shall be free from corrosion when installed.
6. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasters shall use existing mounting holes provided by module manufacturer. No additional holes shall

be drilled on module frames. Module fasteners/ clamps shall be adequately treated to resist corrosion.

7. The support structure shall withstand wind loading of up to 150 km/hr.
8. Adequate spacing shall be provided between any two modules secured on panel assembly for improved wind resistance.
9. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
10. It is required to design the grid structure (on which PV module will be installed) in such a way that all loads are transferred to the existing columns of the buildings. Such grid design should be presented to MEDA, which will be certified by structural engineers.
11. The panel assembly structure should be installed in a manner to leave sufficient space for repair and maintenance aspects of the roof tops, particularly for leakages.
12. Installation of panel assembly should not tamper with the water proofing of roofs.

Array Structure:

a) Hot dip galvanized (minimum of 80 Microns) MS mounting structures may be used for mounting the modules/ panels/ arrays. Each structure should have angle of inclination as per the site conditions to take maximum insolation. However to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

b) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.

c) The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall comply of latest IS 4759.

d) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.

e) The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels

f) The bidder needs to supply suitable structures based on the quality of roof and considering the load baring capacity of the roof/ civil structures of the proposed building.

Electrical:

1. LT distribution grid specifications 415V +/- 5%, 50Hz and frequency variation as per IE rules.
2. The output of the inverter shall be transformer isolated and shall be fed into 415V, 3 phase AC LT grid supplied via LT Air circuit Breaker.
3. The inverter output shall be connected to LT line prior to the LT/ DG changeover switch. The

mandatory islanding protection provided by inverter shall isolate the Solar PV power plant.

4. The time of day (TOD) 3 phase, digital AC load energy meter shall be installed in the Main Distribution Box to monitor energy drawn by building load and in the AC distribution box to monitor energy generated by Solar PV power plant.
5. The load energy meter operation shall be completely independent of the plant AC energy meter.
6. The energy meters shall be provided with communication interface and necessary data cables for remote monitoring.

Data Acquisition System:

1. Data Acquisition System shall be provided for both Grid connected solar PV plants.
2. Computerized DC String/ Array monitoring and AC output monitoring shall be provided as part of the inverter and/ or string/ array combiner box or separately.
3. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
4. The time interval between two sets of data shall not be more than 3 minutes. (A minimum of 20 samples of data shall be recorded per hour)
5. Data Acquisition System shall have real time clock, internal reliable battery backup and data storage capacity to record data round the clock for a period of minimum one year.
6. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
7. The date shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
8. All instantaneous data shall be shown on the computer screen.
9. Software shall be provided for USB download and analysis of DC and AC parametric data for the plant.
10. Provision for internet monitoring and download of data shall be also incorporated.
11. Software for centralized internet monitoring system shall be also provided for download and analysis of cumulative data of the plant and the data of the solar radiation and environment monitoring system.
12. A data logging system (Hardware and Software) for plant control and monitoring shall be provided.
13. Remote Supervisory Control and data acquisition through SCADA or equivalent software at the purchaser's location with latest software/ hardware configuration and service connectivity for online/ real time data monitoring/ control complete to be supplied and operation and maintenance/ control to be ensured by the supplier.
14. Disconnection and Islanding: Disconnection of the PV plant in the event of loss of the main grid supply is to be achieved by in built protection within the power conditioner; this may be achieved through rate of change of current, phase angle, unbalanced voltage or reactive load variants.
15. Operation outside the limits of power quality as described in the Technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic

disconnection are: Neutral voltage displacement Over current Earth fault and reverse power in case of the above, cases, tripping time should be less than (15 seconds Response time in case of grid failure due to switch off or failure based shut down should be well within seconds. In case of use of two PCUs capacity suitable equipment for synchronizing the AC output of both the PCUs to the ACDB/ Grid should be provided.

Automatic reconnection after the grid failure should restore.

16. PCU shall have the facility to reconnect the PCU automatically to the grid, following restoration of grid, subsequent to grid failure condition. And also, the facility to connect the system with load at grid failure condition for essential power supply.

Operating Environment:

1. Temperature: 5 to 55 Deg. C.
2. Relative Humidity: 100% @ 40 Deg. C
3. Precipitation : 2.46 mm per day (Annual average)
4. Clearness Index : 0.62 (Annual average)
5. Wind Speed: up to 150 km/hr.
6. Corrosion : high
7. Dust : moderate to high
8. Bird Interference : high
9. Bird Droppings : frequent and large
10. Trees: large and in abundance.

Connectivity:

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

Plant Capacity	Connecting voltage
Up to 10 kW	240V-single phase or 415V-three phase at the option of the consumer
Above 10kW and up to 100 kW	415V – three phase or High Tension as per site specification.

Utilities may have voltage levels other than above; DISCOMS may be consulted before Finalization of the voltage level and specification should be made accordingly.

Testing, Certification and Approval Schedule:

All components, sub-assemblies and system test parameters shall be verified on site to ensure they meet the specifications.

Plant Power Performance Ratio Testing:

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O & M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance to qualify for release of applicable incentive. Minimum CUF of 15% should be maintained for a period of 5 years. Correction shall be applied based on available solar radiation.

Plant Energy Performance Ratio Testing:

The overall energy performance ratio of the system shall exceed 75%. (Sum total of the system energy losses shall not exceed 25%). For global solar insolation in the Plane of Array (PoA) of 5 kWh/m^2 (5 Peak Sun Hours) for the day

Operation and Maintenance (O & M):

1. Cleaning of solar PV modules with soft water, wet and dry mops: Weekly
2. DC String/ Array and AC Inverter monitoring: Continuous and computerized.
3. AC Energy monitoring: Continuous and computerized.
4. Visual Inspection of the plant: Monthly
5. Functional Checks of Protection Components and Switchgear: Quarterly.
6. Spring Clean PV Array and Installation Area: Quarterly.
7. Inverter, transformer, data acquisition, energy meters and power evacuation checks: Half Yearly.
8. Support structure and terrace water-proofing checks: Yearly.
9. O & M log sheet shall be provided and maintained.
10. The repair/ replacement work shall be completed within 48 hours from the time of reporting the fault.
11. A half yearly performance report of the plant inclusive of energy generation data shall be provided as per approved format.
12. All recorded data for the first 5 years shall be preserved in both manual and computer format and submitted at hand over.

Comprehensive Maintenance Contract (CMC):

(i) The complete Solar PV Power Plants must be guaranteed against any manufacturing/ design/ installation defects for a minimum period of 5 years.

(ii) PV modules used in Solar PV Power Plants must be guaranteed for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

(iii) During the CMC period, MNRE/ MEDA/ users will have all the rights to cross check the performance of the Solar PV Power Plants. MEDA may carry out the frequent inspections of the Solar PV Power Plants installed and randomly pick up its components to get them tested at Govt./ MNRE approved any test centre. If during such tests any part is not found as per the specified

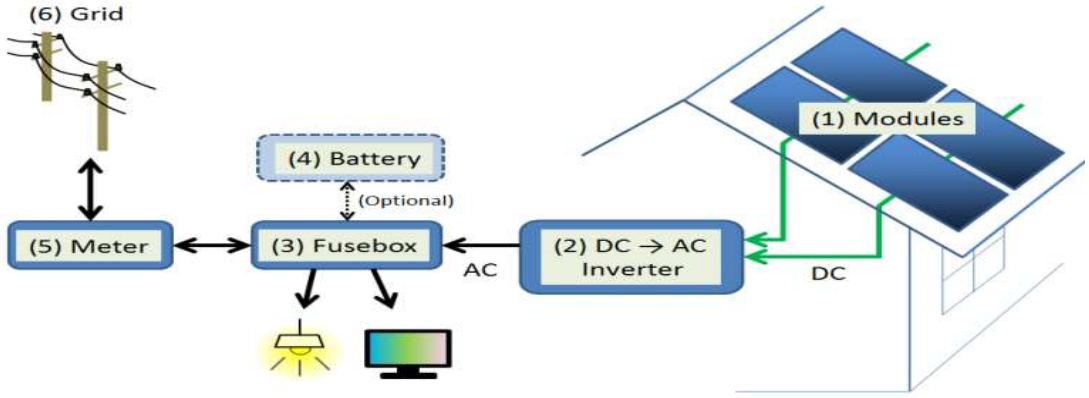
Technical parameters, MEDA will take the necessary action. The decision of MEDA in this regard will be final and binding on the bidder.

Warranties and Guarantees:

1. Solar Modules: Workmanship/ product replacement for 10 years.
2. Solar Modules: 90% power output for 10 years & 80% power output for 25 years.
3. Inverter: Workmanship/ product replacement for 5 years, service for 25 years
4. Power Evacuation and Metering Equipment: Workmanship/ product replacement for 10 years, service for 25 years
5. BoS: Parts and Workmanship for 10 years, service for 25 years.
6. Power Plant Installation: Workmanship for 10 years, service for 25 years
7. PV Array Installation: Structural for 25 years
8. Power plant power performance ratio-min 75%
9. Power plant energy performance ratio-min. 75%

Standards and Compliance:

1. IEC 60364-7-712: Electrical Installations of Buildings: Requirements for Solar PV power supply systems.
2. IEC 61727 or similar: Utility Interface Standard for PV power plants > 10 kW.
3. IEC 62103, 62109 and 62040 (UL 1741): Safety of Static Inverters – Mechanical and Electrical safety aspects.
4. IEC 62116: Testing procedure of Islanding Prevention Methods for Utility-Interactive PV Inverters.
5. PV Modules: IEC 61730- Safety qualification testing, IEC 61701 – Operation in corrosive atmosphere
6. IEC 61215: Crystalline Silicon PV Modules qualification
7. String/ array junction boxes: IP65, Protection Class II, IEC 60439-1, 3.
8. Surge Protection Devices: Type 2, DC 1000V rated.
9. PV module/ string/ string combiner box interconnects: MC4 compatible. DC 1000V rated.
10. The central inverter shall be rated for IP54.
11. The DC/ AC distribution boxes shall be rated IP54.
12. The data acquisition systems shall be rated for IP54.
13. All DC and AC cables, conduits, cable trays, hardware: relevant IS.
14. Earthing System: relevant IS.
15. PV array support structure: relevant IS.
16. Quality Certification, Standards and Testing for Grid-Connected Rooftop mounted Solar PV Systems/ Power Plants should be maintained as per Annexure- A.



APPENDIX- I (A)

Bidder's Information Sheet

Bidder shall provide the information requested in the corresponding Information sheets included here under-

Sr. No.	Particulars	
1.	Name & Mailing Address of firm	
2.	Contact Person Name, Designation & Contact No.	
3.	E-mail Address for correspondence	
4.	Firm Website Address	
5.	Firm Status (Private / PSU / Incorporate / Proprietor)	
6.	Establish Year of firm	
7.	PAN/ TAN No.	
8.	Firm Registration No / ROC	
9.	STR/ VAT / TIN No	
10.	Turnover 2019-20, 2020-21 and 2021-22 (in Lacs Rs.)	
11.	Company Profile (<100 words)	
12.	Skilled manpower	
13.	Experience in SPV Power Plant (<100 words)	
14.	Experience in other solar projects (<100 words)	

Sr. No.	**Particulars**	
15.	Solar related Product Range	
16.	Experience in Guarantee, Maintenance & after Sales Services (Years)	
17.	Accreditation	
18.	List of ISI, ISO, Other cert.	
19.	Technical specification for solar photovoltaic cell / panel / module- make	
20.	Technical specification for Battery- optional – quantity and make	
21.	Technical specification for Junction boxes- quantity and make	
22.	Technical specification for Inverter / Controller -quantity and make	
23.	Technical specification for Cables- quantity and make	
24.	Other Technical specification, if any	
25.	Has any Govt. / Under - taking ever debarred the company / firm from executing any work?	
26.	Special Remarks, if any	
27.	Attached are copies of the necessary original documents.	
I.		
II.		
III.		

It is certified that the information provided above is true to the best of my knowledge and belief. If any information found to be concealed, suppressed or incorrect at later date, our tender shall be liable to be rejected and our company may be debarred from executing any business with MEDA.

Date:

Signature of Bidder
Name:
Designation:
Company:

APPENDIX- I (B)

Annual Turnover

Each Bidder must fill in this form including private/ public limited company.

Annual Turnover Data for last 3 Years (FY 2019-20 2020-21 & 2021-22)	
Year	**Rs in Lac**
2019-20	
2020-21	
2021-22	
Total	

The information supplied should be the Annual Turnover of the Bidder in terms of the amounts billed to clients for each year for work in progress or completed.

Signature of Applicant

Certified by Applicant's Auditor
(Affix Stamp)

APPENDIX- II

FORM OF PERFORMANCE BANK GUARANTEE

To: Maharashtra Energy Development Agency

Represented by

Divisional General Manager

Maharashtra Energy Development Agency

_____,

_____ Pin:– 440001

WHEREAS _____ *[name and address of Contractor]* (hereinafter called "the **Contractor**") has undertaken, in pursuance of **Work Order No.** _____ **Tender No. --------- for works _____,** dated _____ 2023 to Design, Fabrication, Supply, Installation, Testing, Commissioning and Operation & Maintenance for a period of 5 years of **total 227 kW capacity Grid-Connected Solar PV Power Plant under roof-top net metering at various 13 Industrial Training Institute (ITI) Buildings in Chandrapur District** in the state of Maharashtra. (hereinafter referred to as the contract of works) and as described in the Bidding Data in Maharashtra State for works under single point responsibility **"Turnkey Contracts"** basis (hereinafter called "the **Contract**");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ *[amount of Guarantee]* _____ *[in words]*, and we undertake to pay you, through our branch office at _____ upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of Guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of completion of the defects liability period, with a claim period of further one month.

Yours truly,	_____
Signature and seal of the Guarantor:	_____
Name of Bank/Financial Institution:	_____
Address:	_____
Date:	_____

APPENDIX- III

Experience for Supply and Commissioning of Solar Power Plants

Sr. No.	Name of Project	Plant Capacity	Year of Work	Current Status of Project/ Client's Certificate

*Self - attested copy of work order attached herewith

Signature of Bidder

Name

Designation

Company

Date

APPENDIX- IV
SITE VISIT REPORT LETTER

(To be submitted for all 13 sites separately on letter head of bidder)

Date: _____

To,
Divisional General Manager,
Maharashtra Energy Development Agency,
MEDA, _____

Sub. : Site Visit Report for installation of ……. kWp Grid Connected SPV power plant under roof-top net metering at Government Industrial Training Institute …… (Name of Building)**……** (Name of Place) **Dist. Chandrapur**

Ref.: MEDA's Tender No. ----------

Sir,

This has reference to above referred tender of electrification of Government Industrial Training Institute ……, Tal ……..……, Dist. Chandrapur (Maharashtra) to be electrified through Solar Power. I / We hereby declare that we have visited site.

I / We made ourselves acquainted with site conditions, approach to site, requirement of land, soil conditions, availability of water, requirement of tender conditions etc.

I / We verified all details required to execute the projects. I / We have no problems in undertaking the projects and complete them in the given time period.

Thanking you

Yours faithfully,

(Signature of Bidder)

Name of Bidder ----------

Designation ----------

Seal:

Signature of Beneficiary authorities

Seal:.....

Annexure- A

QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID- CONNECTED SOLAR ROOF – TOP PV SYSTEMS/ POWER PLANTS

Quality certification and standards for grid-connected solar Roof – Top Net Metering PV systems are essential for the successful mass-scale implementation of this technology. It is also imperative to put in place an efficient and rigorous monitoring mechanism, adherence to these standards. Hence, all components of grid-connected solar Roof – Top Net Metering PV systems/ plant must conform to the relevant standards and certifications given below:

Solar PV Modules/ Panels	
IEC 61215/ IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61701	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853- Part 1 /IS 16170: Part 1	Photovoltaic (PV) module performance testing and energy rating –: Irradiance and temperature performance measurements, and power rating
IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH3) Corrosion Testing (As per the site condition like dairies, toilets)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction, Part 2: Requirements for Testing
Solar PV Inverters	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems Part 2: Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)
IEC/ IS 61683 (as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
IEC 62116/ UL1741/ IEEE 1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Islanding Prevention Measures
IEC 60255-27	Measuring relays and protection equipment – Part 27: Product safety requirements
IEC 60068- 2 /IEC 62093	Environmental Testing of PV System – Power Conditioners and Inverters

(as applicable)	
Fuses	
IS/ IEC 60947(Part 1, 2 & 3), EN50521	General safety requirements for connectors, switches, circuit breakers (AC/ DC): a) Low-voltage Switchgear and Control-gear, Part 1: General rules b) Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers c) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units d) EN 50521: Connectors for photovoltaic systems – Safety requirements and tests
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
Surge Arrestors	
BFC 17 -102: 2011	Lightening Protection Standard
IEC 60364-5-53/ IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
IEC 61643- 11: 2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods
Cables	
IEC 60227/ IS694, IEC 60502/ IS1554 (Part 1 & 2)/ IEC 69947 (as applicable)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC Cables
Earthing/ Lightning	
IEC 62561 Series (Chemical earthing) (as applicable)	IEC 62561-1 Lightning protection system components (LPSC) - Part 1: 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 protection for outdoor use, and IP 54 protection for indoor use
Energy Meter	
IS 16444 or as specified by the DISCOMs	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2 — Specification (with Import & Export/Net energy measurements)
Solar PV Roof Mounting Structure	
IS 2062/ IS 4759	Material for the structure mounting

Note- Equivalent standards may be used for different system components of the plants.

ANNEXURE - B

Check List

All the necessary Documents/ Certificates should be uploaded as a SINGLE PDF in proper sequence as mentioned below:

1. Original tender document duly signed and stamped on each page or Undertaking (Rs.100) and declaration that all the terms & conditions mentioned in each and every page of the said tender document with further clarifications released if any are acceptable.
2. EMD and Tender document fee (It is compulsory to pay tender document fee, EMD through E-payment SBI Net Banking, RTGS and NEFT only).
3. Name of authorized person (power of attorney) for submitting the document.
4. Name of the Banker.
5. Copy of the recently paid Income Tax Challan/ Return, Latest CA certified balance sheet of past three years, PAN number, professional tax, GST Registration Certificate etc. (Self-Attested)
6. Information on Infrastructure for maintenance work.
7. Registration Certificate of the firm and Gumastha of Maharashtra State.
8. Bidder's Information Sheet Appendix**-I (A)**.
9. Annual Turnover **Appendix-I (B)**.
10. Valid Electrical Contractor licence.
11. Experience for supply and commissioning of Solar Power Plants **APPENDIX-III** (along with the self-attested copies of work order).
12. Site visit Report Letter for the location, **Appendix-IV**.
13. IEC 61215 (revised) certificate for SPV module and IEC 61683/ IS 61683 for Inverter as per **Annexure - A**.
14. Commitment in respect of generation separate for Grid connected solar power plants in the prescribed format given the tender.
15. Certificate mentioning that bidder company is not blacklisted in any case/ nor got any failure in the project completed by the company.
16. Self-certification about set up of after sales service by company.

If any of the documents is not uploaded the tender will be rejected.