

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA),  
DIVISIONAL OFFICE, LATUR**

**Design, manufacture, supply, installation, testing, commissioning with remote  
monitoring system 24 kWp capacity grid-connected solar PV power plant  
under roof-top net metering system At ITI College, Shirur Anantpal, Dist.  
Latur, state of Maharashtra with comprehensive maintenance contract for 5  
years.**



(A Government of Maharashtra Institution)

**e-TENDER FOR**

**DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING, COMMISSIONING  
WITH REMOTE MONITORING SYSTEM OF CUMULATIVE TOTAL 24 kWp  
CAPACITY GRID- CONNECTED SOLAR PV POWER PLANT UNDER ROOF-TOP  
NET METERING SYSTEM AT ITI COLLEGE, SHIRUR ANANTPAL, DIST. LATUR,  
IN THE STATE OF MAHARASHTRA WITH COMPREHENSIVE MAINTENANCE  
CONTRACT FOR 5 YEARS.**

**Tender Reference No.:- DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01**

**<https://mahatenders.gov.in>**

**TENDER DOCUMENT**

**Divisional General Manager (Latur)  
MAHARASHTRA ENERGY DEVELOPMENT  
AGENCY**

SHRI.SHRI. HEIGHTS, FIRST FLOOR, SURVEY NO. 27/A/1, PLOT NO.5, ABOVE IDBI BANK, AUSA ROAD LATUR - 413512

**Phone No: - 02382-226680**

**E-mail ID: - [domedalatur@mahaurja.com](mailto:domedalatur@mahaurja.com)**

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

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MAHARASHTRA.

**TABLE OF CONTENTS**

<b>Sr. No.</b>	<b>CONTENTS</b>	<b>Page No.</b>
<b>PART A – TECHNICAL BID</b>		
<b>SECTION-I BID INVITATION</b>		4
1	Brief Description of the Bidding Process	4
2	Bidding Information	5
<b>SECTION-II INFORMATION AND INSTRUCTION TO BIDDERS</b>		6
1	Scope of Work	7
2	Eligibility	8
3	Standards and Certificates	8
4	Instructions	9
5	Cost of Bidding	10
6	Language of Bid	10
7	Documents Comprising the Bid	10
8	Earnest Money Deposit (E.M.D.), Security Deposit and Forfeiting of E.M.D.	12
9	Price Variation	13
10	Jurisdiction	14
11	Period of Validity of Bids	14
12	Mode of submission of Bids	14
13	Deadline for Submission of Bids	14
14	Clarification of Bids	14
15	Pre Bid Meeting	14
16	Preliminary Examination	15
17	Acceptance or Rejection of Bids	15
18	Criteria for Evaluation of Bids	16
19	Award Criteria- Award of Contract	17
20	Corrupt or Fraudulent Practices	17
21	Terms of Payment	18
22	Time Frame	18
23	Penalty Clause	19
<b>SECTION - III GENERAL TERMS AND CONDITIONS</b>		20
1	General Terms and Conditions of Tender	20
2	Communications	22
3	Manner of Execution	23
4	Application	23
5	Standards	23
6	Inspection	24
7	Transportation	24
8	Assignment	24
9	Sub-contracts	24
10	Termination for Default	25
11	Applicable Law	25
12	Notices	25

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

13	Packing	25
14	Spares & tools-tackles	26
15	Danger Plates	26
16	Control Room	26
17	Insurance	26
18	Grid Connectivity	27
19	Warranties and Guarantees	27
<b>SECTION - IV :TECHNICAL SPECIFICATION</b>		28
1	Brief Information About Site	28
2	Technical and General Specifications (355kWp Grid Connected)	29
3	CMC	47
<b>ANNEXURE</b>		
1	Annexure -A : Quality Certification, Standards And Testing	49
2	Annexure -B : Standard format for performance bank guaranty	52
<b>FORMAT</b>		
1	Format – A Power of Attorney	54
2	Format – B Declaration	55
3	Format – C Banker Details	56
4	Format – D Bidders Information	57
5	Format – E Details of team for after sales support	58
6	Format – F Certificate for Turnover	59
7	Format – G List of Project	60
8	Format – H Site Visit Report	61
9	Format – I Details of Offered SPV System	62
10	Format – J Data for Assured Power Generation	63
11	Check List	64

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**SECTION-I**

**BID INVITATION**

**Brief Description of Tender Process**

- **Divisional General Manager, Maharashtra Energy Development Agency, Divisional office, Latur** on behalf of **MEDA (the Employer)**, invites eligible bidder to submit a tender 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 tender 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 tender document. 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).
- MEDA will open the technical bid of the Bidder, by e-tendering process. The financial bid will be opened of those bidders which will be qualified in the technical bid.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

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MAHARASHTRA.

**BIDDING INFORMATION**

1.	Tender Reference No.	<b>DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01</b>
2.	Tender can be downloaded	<b>From 07/06/2021 to 17/06/2021</b>
3.	Estimated Cost 24kWp Grid Connected PV Solar Power Generation Plant	<b>Rs.9,27,000</b> (Rs. Nine Lakhstweny seven Thousand Only) ( including net meter charges with 5 year CMC)
4.	Tender document fee	<b>Rs. 2400/-</b> (Rs. Twenty four thousand Only) (NonRefundable &Nontransferable) to be submitted online.
5.	Earnest Money Deposit (EMD)	<b>Rs. 14000/-</b> (as per purchase policy dated 1/12/2016) Exemption allowed for MSMEs, having valid certificate issued by MSME for availing exemption. It is mandatory to upload such certificate.
6.	Date & Time of Pre Bid Meeting	All participants are requested to send their queries, if any, <a href="mailto:domedalatur@mahaurja.com">domedalatur@mahaurja.com</a> 14/06/2021 at 11:30 am Divisional Office, Maharashtra Energy Development Agency, Latur.
7.	Last date & Time for submission of Bids	<b>17/06/2021 upto 14:00</b>
8.	Date & Time Of opening Of Technical Bid	<b>18/06/2021 at 14:00</b>
9.	Security Deposit:	3% of the Contract Value (NEFT/RTGS) after work Acceptance and before placement of LOI/ WorkOrder.
10.	Address for communication and Venue for Tender opening	<b>MAHARASHTRA ENERGY DEVELOPMENT AGENCY, LATUR.</b> Shri. Shri. Heights, First Floor, S.N. 27/A/1, Plot No. 5 Above IDBI Bank, Ausa Road, Latur-413512

- The date &time of opening of Price Bid will be announced later.
- If any technical difficulties arise while filling up e-tender, please contact MEDA.
- It is compulsory to pay tender document fee, EMD through e-payment gateway at <https://mahatenders.gov.in> by **online** only.
- Eligible bidders can upload the Tenders through Maha e-tender portal of Go M:<https://mahatenders.gov.in>
- The Quantity / capacity of the project may increase up to 50% at the sole discretion of Employer.

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MAHARASHTRA.

**SECTION-II**

**INFORMATION AND INSTRUCTION TO BIDDERS**

**The Divisional General Manager** (Divisional Office, Latur), on behalf of **MEDA** (the Employer), invites e-tender from eligible bidders for “works” include Design, Manufacture, Supply, Installation, Testing and Commissioning with five years Comprehensive Maintenance of 24kWp Grid Connected Solar Power Generation Plant at ITI College, Shirur Anantpal in Latur Dist. 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:  
DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01

Sr. No.	Proposed Project Location	Capacity of Grid-Connected Solar PV Plant	Cost in Rs.
1	ITI College, Shirur Anantpal, Dist.Latur	24 kWp	9,27,000/-
	<b>TOTAL</b>	<b>24 kWp</b>	<b>9,27,000/-</b>

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MAHARASHTRA.

**1. Scope of Work**

- Design, Manufacture, Supply, Installation, Testing and Commissioning with five years comprehensive maintenance contract for 24kWp. Grid connected SPV power plants, at ITI College, Shirur Anantpal in Latur District the state of Maharashtra on “Turnkey” Contract Basis and as described in the Bidding Document.
- Free replacement of defective components of systems within Comprehensive Maintenance period (CMC) of 5 years after commissioning of the project for efficient running of the system. Bidder can quote only after the all site visit.
- The Successful bidder should complete this project in given time to get maximum Incentives to the beneficiary. MEDA will not be responsible if no incentives / less incentive is received to the beneficiary due to delay in project work.
- Detailed planning for smooth execution of project.
- Selected Bidder shall be bound to operate and maintain the system as per the rules, regulations and modalities as prescribed by MNRE and MEDA for the effective functioning of the project.
- Remote Monitoring System (RMS) with Wi-Fi/GSM is necessary to install at the location and provide quarterly generation report up to 5 years after commissioning at Divisional Office, MEDA, Latur.
- **Time is the essence in completing the Works:** The bidder shall ensure that Solar PV Power Generation Plant should be installed within 90 Days at site and Net metering installation at site should be completed within next 90 Days after installation of SPV plants. However total project completion period should not exceed 180 days.
- 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.
- Bids shall be complete and cover all works described in the tender. However if any item of works required for completing the project shall be deemed to be included in beneficiary scope; irrespective of whether it is specifically mentioned or not in the tender document.
- Bidder should obtain the statutory permissions from statutory bodies wherever required for execution of works.

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MAHARASHTRA.

- 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.

**2. Eligibility**

The bidder shall provide sufficient documentary evidence to satisfy the following conditions:

- Manufacture/supply the material (module & inverter) only as per the standards mention in tender document. They should provide valid IEC certificate of SPV Module & Inverter and test report from authorized test centre of MNRE GoI.
- Bidder shall have the experience for installation & commissioning of grid connected solar power plant for single capacity of 25 kW and cumulative capacity of 100 kW installed, commissioned & working successfully in last three years. Demonstration for such installations if required may be allowed during pre-bid meeting (individual time slot will not be allowed for more than 10 Minutes). Satisfactory certificate along with contact details of concern authority at installation (Beneficiary/Client) is to be submitted. Representative of MEDA&/OR representative of appointed consultant by MEDA for this assignment will / may visit such installation. Bidders to arrange necessary permissions.
- Cumulative Annual Turnover of the Company/Firm/ Corporation in the last three financial years should be at least Rs. 30,000,00/- (Rupees thirty Lakh Only) (This must be the individual Company's turnover and not that of any group of Companies; A summarized sheet of turnover for last three years with average turnover certified by registered CA should be compulsorily enclosed).

**3. Standards / Certificates**

- The material/ equipment /components supplied and works executed under this contract shall be confirmed to the standards mentioned in the technical specification & Annexure- A. Where no standards are mentioned, the latest version of Indian Standard Institution or Bureau of Indian Specification shall be considered.
- 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.

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CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**4. Instructions**

- Bidder shall upload his information, experience certificates, test reports and other such relevant document's specified in the list of other important documents on the portal <https://mahatenders.gov.in>.
- 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 fulfill 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 at tender web site by MEDA.
- The price bid will be opened in presence of the all technically qualified bidders.
- Bids submitted without EMD will be rejected. Bidder would need to upload the required documents through electronic mode only.
- The Bidder shall upload copies of
  1. GST registration Certificate
  2. MSME registration
  3. PAN Card
  4. Income Tax Returns of previous three assessment years.
- For any Clarification /online support please contact at mail id: [domedalatur@mahauria.com](mailto:domedalatur@mahauria.com)
- MEDA reserves the right

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

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MAHARASHTRA.

1. To reject or accept any or all tenders without assigning any reasons thereof.
  2. 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.

**5. 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.

**6. 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 the 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 the 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.

**7. Documents Comprising to the Tender**

The tender prepared by the Bidder shall be uploaded in two parts viz. Technical Bid and Financial Bid comprising the following components.

**Part I - Technical Proposal:**

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

- Copy of receipt for tender fee
- Copy of receipt for EMD/Valid exemption certificate issued by competent Govt. authority
- Duly stamped and signed tender document (Tender Document)

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MAHARASHTRA.

- Firm registration certificate
- Copy of PAN
- Copy of GST registration
- Power of attorney; for company's authorized person (Refer Format -A)
- Self Certification of No Barr/non failure/blacklisted (Refer Format -B)
- Banker's details of bidder (Refer Format - C)
- Bidder's Information Sheet (Refer Format -D)
- Details of set-up for after sales service (Refer Format -E)
- Financial credentials of bidder (Refer Format - F), along with scanned copy of IT returns for last three financial years, supporting with summery of balance sheet / auditor's report
- Experience for installation and commissioning of solar power plant /list of projects along with work order & purchase order along with Project completion report/commissioning report should be submitted by the bidder.
- Site visit report (Refer Format - H)
- Details of proposed / offered system (Refer Format -I)
- Details for out-put / power generation – assumed & assured from proposed / offered system (Refer Format -J)
- Brochure for offered P V Module along with test certificates compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranty & Warranty.
- Brochure for offered Inverter along with test certificates compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranty &Warranty.

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 Plant.
- Prices shall be quoted in Indian Rupees only.

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MAHARASHTRA.

- In no circumstances, escalation in the prices will be pertained.
- 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.

**8. Earnest Money Deposit (EMD), Security Deposit (SD) & Forfeiting of EMD:**

**A) Earnest Money deposit:**

The Earnest Money Deposit of Rs.14000/-should be paid online through respective portal. Tender without Earnest Money Deposit will be out rightly rejected. No interest shall be payable on the amount of Earnest Money. 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.

Bidders having exemption under MSME shall necessarily submit self-attested copy of valid exemption certificate; otherwise tender shall be out rightly rejected.

L1 Bidder is to submit original copy(s) of such certificate / registration for review / verification, before issuing the LOA. In absence of original certificate / registration, further tendering procedure shall be stopped with such L1 Bidder, with immediate effect and appropriate strict actions will be taken against such Bidder, including recovery of EMD amount.

**B) Forfeiting of EMD:**

The EMD 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.
6. If the L1 bidder does not accept the work then MEDA will blacklist the L1 bidder

**C) Security Deposit:**

The Bidder shall furnish security deposit at 3% of the total contract value within 10 days after work acceptance and before placement of LOI/ Work Order by NEFT/RTGS. Failure to

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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.

1. 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 fulfill the contractual obligations or fails to settle in full his dues to MEDA.
2. 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.
3. The MEDA is empowered to recover from the security deposit for any sum due or 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.
4. The security deposit shall be released to the Bidder only after contract is completed to the satisfaction of the MEDA.

**9. Price Variation:**

The Project cost shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable by MEDA. However, statutory variation of taxes and duties may be paid by the roof top owner.

In event bidder offers price less than 80% of estimated cost indicated in this tender document; which is based on contemporary bench mark price declared by MNRE. Such 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. Necessarily, no exemption in tender fee & EMD shall be allowed for such price bid. Such lowest bid without tender fee & EMD shall be out rightly rejected during financial evaluation though the bidder is technically qualified.

**10. Jurisdiction:**

In case of any dispute, in the documentation and during implementation, commissioning,

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MAHARASHTRA.

completion and CMC period, all the matter will be resolve under Latur Jurisdiction only.

**11. Period of Validity of Bid**

- Bids shall remain valid for 90 days after the date of opening of Technical Bid.
- In exceptional circumstances, MEDA may solicit the Bidder's consent to extend the period of validity. The request and the responses there 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.

**12. 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 the Bidder to submit the hard copy of any of the document/information submitted on e-tender platform.

**13. 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 technical Bids, MEDA, may, at its discretion, ask the bidders for clarifications, valid supporting documents for of their Proposals. 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.

**15. Pre Bid Meeting:**

Pre bid meeting shall be called at office of Maharashtra Energy Development Agency, Divisional Office Latur to clarify doubts, if any of the bidders after one week of floating tender on site <https://mahatenders.gov.in> before submission of final tender document.

**16. Preliminary Examination**

- The MEDA will examine the Bids to determine whether they are complete, whether any

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
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MAHARASHTRA.

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 labor 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.

**17. 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.

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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 blacklisted.

**18. 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 the 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 shortlisted.

**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.

**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. Presence of the Bidders Representatives is essential. No claim / further clarification will be entertained, to the Bidder in case the Representative fails to attend this meeting.
- 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.

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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.

**19. Award Criteria and Award of Contract**

The tendering authority reserves the rights to allot the work to more than one successful bidder (Not more than three including L1) for completing the said work within the given timeframe, if the other successful bidders are ready to work at L1 price. In such situation the L1 bidder/s will be allotted not less than 50% of work.

**20. 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;
- “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.

**21. Terms of Payment:**

- 80% of the total cost will be released after supply, installation & successful commissioning of the systems duly certified by Bidder, Divisional General Manager of MEDA, Latur

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

& authorized person of Beneficiary along with submission of Insurance policy documents effective from date of commissioning for CMC period.

- 20% of the total cost shall be released on submission of three months successful performance report in prescribed format generated automatically through Remote real time Monitoring System as well as manually which should be duly certified by Divisional General Manager of MEDA, Latur authorized person of Beneficiary and submission of Performance Bank Guarantee of 3% of total project cost from any Nationalized Bank valid for period of 5 years.
- Energy meter / bidirectional net - meter shall be supplied as per specification by DISCOM & shall be installed at location / feed-injection point as indicated in consent received for grid connectivity by DISCOM also charges regarding net meter for successful grid connectivity should be paid by the successful bidder.
- Remote Monitoring System (RMS) with Wi-Fi/GSM is necessary to install at the project location and provision of recharge for above system during comprehensive maintenance contract of 5 years by successful bidder.
- **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 issued 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.

**Time Frame:**

- The time frame for the completion of work is 180 Days from the date of issue of work order.

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**Project Timelines**

Sr. No.	Description	Timeline <Insert dates>
1.	Issuance of Letter of Award	Zero date
2.	Signing of Agreement with Government Organization Institution/Offices.	Within 15 calendar days after Issuance of Letter of Award
3.	Registration of solar power project with MNRE	Within 30 calendar days after Issuance of Letter of Award
4.	Installation of Solar power Project	Within 90 calendar days after Issuance of Letter of Award
5.	Installation of Net-meter Commissioning and Acceptance of Solar power project	Within 180 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 milestones or else he will be liable for Penalty against incomplete milestone.

Sr. No.	Milestone	Work Status
1	In 45 days	60% Completion of work
2	In 90 days i.e. Installation of Solar power Project	100% Installation of Solar power Project
3	In 180 days	Commissioning and Acceptance of Solar power project i.e. Installation of Net-meter Commissioning and Acceptance of Solar power project.

**23. 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 balance 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 get 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.

If bidder, who is L1, rejects to accept the work order, the excess cost paid to the L2 bidder over the L1 bid cost shall be recovered from the L1 bidder through his EMD submitted for participation in the tender.

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

**DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.**

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**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 PV Solar Power Generation Plants, as per the specifications given in the document.

- a) Bidder shall be responsible for any damage occurred, if any, to other installations of the existing office building / establishment / area at site during the course 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 ARISING 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.
- 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 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 system and certificate in this respect should be submitted.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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 General Manager, MEDA, Latur 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 from any amount due to the supplier apart from the forfeiture of 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) It will be responsibility of the Bidder to ensure the satisfactory performance of the system.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- q) 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.
- r) 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 or any law relating there and rules made there under from time to time.
- s) If previous performance of any Bidder found unsatisfactory, he will be disqualified.
- t) If any information / confirmation on any point of these tender conditions are required Bidder may contact / write to General Manager, MEDA, giving tender reference no.etc.
- u) In the event of dispute during installation & commissioning of the systems related to the work and documents, decision of the General Manager, MEDA shall be final.
- v) The General Manager, MEDA reserves the rights to distribute the work among the Bidders who are eligible and have submitted the offers.
- w) Once the Bidder submit his offer and subsequently if not interested to work, in such case MEDA will forfeit his EMD amount.
- x) 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.
- y) The General Manager, MEDA 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, subject to L2 bidder accept the work at received L1 price.
- z) 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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.

**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 PV Solar Power Generation 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 for the 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, 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 conform 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**6. Inspection:**

- Successful bidder to submit the design engineering documents, Calculations & Drawings within weeks time after issue of work order for review & approve by MEDA &/OR Appointed consultant by MEDA.
- The projects will be inspected for quality at any time during commissioning or after the completion of the project by MEDA &/OR Appointed consultant by MEDA.
- Bidder shall inform MEDA 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 / for 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**

Sub-contract is strictly prohibited (Turnkey i.e. E.P.C. as well as C.M.C.).

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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. Spares & Tools-Tackles**

The bidder shall provide/supply its own necessary tools-tackles for erection & testing and required for CMC, along with sufficient quantity for consumable items/spares for replacement, if any.

**15. Danger Plates**

The bidder shall provide at least 1 Danger Notice Plate at each project site of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enameled white on both sides and with inscription in signal red color on front side as required. The inscription shall be in English and local language.

**16. Control Room**

Installation of Inverters shall be done at safe weatherproof location at site for PV SolarPower Generation Plants.

**17. 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 / CMC period for 100% of offered price.
- 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**18. Grid Connectivity**

Successful bidder has to process the application & obtain grid connectivity. Applicable fees shall be paid by Successful bidder. Also, clubbing of existing meters, increase the sanctioned load, shall be in the scope of Successful bidder. Successful bidder has to review & confirm type & capacity of existing CT/PT & transformer for compatibility with type & capacity of proposed Solar Power Generation System during design engineering, well before placing orders for system components, however, such changes / replacement for CT/PT, transformer shall be done by the successful bidder. Successful bidder to make sure / do the follow- up for such changes / replacement within stipulated time. Also, Successful bidder to arrange attends inspection by representative of DISCOM, if any.

Energy meter / bidirectional net - meter shall be supplied as per specification by DISCOM & shall be installed at location / fed-injection point, indicated in consent received for grid connectivity by DISCOM. charges regarding net meter for successful grid connectivity shall be paid by the successful bidder.

**19. 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/Warranties 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**SECTION-IV**

**BRIEF INFORMATION ABOUT SITE**

**Site Address:**

<b>Sr. No.</b>	<b>Proposed Project Location</b>	<b>Capacity of Grid- Connected Solar PV Plant</b>	<b>Cost in Rs</b>
1	ITI College, Shirur Anantpal Dist. Latur	24 kWp	9,27,000/-
	<b>TOTAL</b>	<b>24 kWp</b>	<b>9,27,000/-</b>

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**TECHNICAL SPECIFICATION OF  
PV SOLAR POWER GENERATION PLANT  
(24kWp; Grid Connected)**

**Definition**

A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, Net-meter 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 PV Solar Power Generation 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 plant 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 plant 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, if required; DC cabling, DC distribution box, if required; 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 existing roof top of the building using fixed PV array support structure.
6. The individual string / array combiner boxes and DC cabling shall be installed on roof top of the building.
7. The inverter shall be installed in the control room / open space provided in the building.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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.

**PV Array**

The solar PV array should comprise of solar polycrystalline modules with minimum capacity of 300Wp and above wattage. Module capacity less than 300Wp 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 or monocrystalline.
4. Individual PV modules rating should be of minimum 325 Watts.
5. The rated maximum power rating of PV modules should have positive tolerance in range of 0 to +2%. And negative temperature co-efficient of power for PV modules should be less than or equal to 0.40% 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 maybe.
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 / clamping, 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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). Inverter shall be equipped with 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 / clamping, 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°C, 45°C, 60°C 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 25years.

15. The PV module must have 10 years free replacement guarantee against material defect or craftsmanship. Guarantee warrantee certificate / document shall be issued by OEM to end user /client; and not issued to/by Bidder.

16. Name of the manufacturer of PV module; name and manufacturer of the solar cell; month and year of manufacture; I-V curve, wattage,  $I_m$ ,  $V_m$ , FF for the module; unique serialno & 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

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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.

**Inverter**

The PCU required shall not be less than rated 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 Type: Grid connected

Control Type: Voltage source, microprocessor assisted, output regulation. Output voltage: 3 phase, 415 V AC / 230V AC (+20%, -20% V AC) site specific Frequency: 50 Hz (+3 Hz, -3 Hz)

Continuous rating: KV (rated +10%) with Import/Export net metering

Normal Power: +KVA

Total Harmonic Distortion: less than 3% Operating temperature Range: 0 to 60 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 higher liability.
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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

meet the specifications listed above at high conversion efficiency and with high reliability. The PCU shall feed the Loads from Solar Energy being produced. And 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 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 centers / 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 shut down/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,

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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, 3 phase AC LT voltage grid.

17. The inverter shall incorporate 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 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 panel for display of PV array DC voltage, current and power, 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. 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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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 Or Manufactures shall have manufacturing & testing facilities as per norms in IEC standards, product shall be delivered along with such test reports / certificates.

**Protections:**

**Lightning Protection**

The PV Solar Power Generation 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 arrestors (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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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 shall be carried out as per IE Rules. All other cabling above ground should be suitably mounted on cable trays with proper covers, or in conduits.

- 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 IEC60189.

**Electrical Safety, Earthing Protection**

- 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**Earthing Protection**

Each array structure of the PV yard should be grounded properly. In addition the lightning 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 the beneficiary 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 battery/control room, solar array area and main entry from administrative block

**Balance of Systems (BoS)**

1. String/Array combiner boxes, if required, 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 the Roof top. 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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 of 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 rooftop 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 of 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. Bidders are required to visit the site & collect required data for workout estimates for such site specific structure, if any.
2. For structural purpose, the panels plus support system that works as a distortion-free integral structural unit.
3. The panel assembly should at most 5mx 5min plan area. The max height of panel above

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

roof surface does not exceed 1.2m.

4. 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.).
5. PV array shall be installed in the space free from any obstruction and/or shadow.
6. Drainage and roof treatment should not be affected by the installation.
7. 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 be at most 45 kg/sq m ( $W$  divided by the plan area).
8. 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).
9. 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.
10. 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.
11. Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- 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 incorporated 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 of 80 micron thickness of Zn coating 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 fasteners 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/ stainless steel.
7. The support structure shall withstand wind loading of up to 150km/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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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. The supplier will supply and install required size of water tank, pump, pipe etc. for cleaning the PV modules. Client will provide water piping from source to inlet of such water tank.

13. 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 isolation. 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 be in compliance of latest IS4759.

d) Structural material shall be corrosion resistant and electrolytic ally compatible with the materials used in the module frame, its fasteners, and nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting needs 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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

- f) The bidder need to supply suitable structures based on the quality of roof and considering the load bearing 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 fed into 415V, 3 phase AC LT grid supplied via LTMCCB.
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. Two time of day (TOD) 3 phase, digital AC load energy meter shall be installed one in the Main Distribution Box to monitor energy drawn by building load and other 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.

**Data Acquisition System**

1. Data Acquisition System shall be provided for solar PV plant.
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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

**DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.**

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 purchasers 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 done 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

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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: 0 to 60 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 150km/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.

<b>Plant Capacity</b>	<b>Connecting voltage</b>
Less than 8 kW / 40A	230/ 240 V (single phase)
Up to 150 kW /187 kVA	400/415 V (three phase)
Above 150 kW /187 kVA	11 kV and above

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

**Testing, Certification and Approval Schedule**

All components, sub-assemblies and system test parameters shall be verified on site to ensure

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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 insulation in the Plane of Array (PoA) of 5 kWh/ m<sup>2</sup> (5 Peak Sun Hours) for the day. For example: 10kW PV power plant AC energy output shall be minimum of 37.5 kWh (10 kW x 0.75 x 5 hrs.) for the day. If system produces units below guaranteed generation as mentioned above then penalty of Rs. 6/- per unit will be levied. Accordingly, bidder has to quote.

**Operation and Maintenance (O&M)**

1. Cleaning of solar PV modules with 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, 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.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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 Plant must be guaranteed against any manufacturing / design/ installation defects for a minimum period of 5years.

(ii) PV modules used in Solar PV Power Plant must be guaranteed for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25years.

(iii) During the CMC period, MNRE/MEDA will have all the rights to cross check the performance of the Solar PV Power Plant. MEDA may carry out the frequent inspections of the Solar PV Power Plant 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 10years.
2. Solar Modules: 90% power output for 10 years & 80% power output for 25years.
3. Inverter: Workmanship/product replacement for 5 years, service for 25years
4. Power Evacuation and Metering Equipment: Workmanship/product replacement for 10 years, service for 25years
5. BoS: Parts and Workmanship for 10 years, service for 25years.
6. Power Plant Installation: Workmanship for 10 years, service for 25years
7. PV Array Installation: Structural for 25years
8. Power plant power performance ratio-min75%
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 > 10kW.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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, and IEC 60439-1, 3.
8. Surge Protection Devices: Type 2, DC 1000Vrated.
9. PV module / string / string combiner box interconnects: MC4 compatible. DC 1000Vrated.
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 Solar PV Systems/ Power Plants should be maintained as per Annexure-A.

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**ANNEXURE- A**

**QUALITY CERTIFICATION, STANDARDS AND TESTING**

**FOR GRID- CONNECTED ROOFTOP SOLAR PV SYSTEMS/ POWERPLANTS**

Quality certification and standards for grid-connected rooftop solar 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 rooftop solar PV system/ plant must conform to the relevant standards and certifications given below:

<b>Solar PV Modules/Panels</b>	
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 (NH <sub>3</sub> ) 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
<b>Solar PV Inverters</b>	
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 (as applicable)	Environmental Testing of PV System – Power Conditioners and Inverters

Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

<b>Fuses</b>	
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 b) Y6EN 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
<b>Surge Arrestors</b>	
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
<b>Cables</b>	
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
<b>Earthing /Lightning</b>	
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
<b>Junction Boxes</b>	

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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

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
<b>Energy Meter</b>	
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)
<b>Solar PV Roof Mounting Structure</b>	
IS 2062/ IS 4759	Material for the structure mounting

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

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**ANNEXURE- B**

Sample / Standard Format for PERFORMANCE BANK GUARANTEE

To,

General Manager,  
Divisional Office Latur  
Maharashtra Energy Development Agency,  
Shri.Shri.Hights, First Floor, Survey No. 27/A/1,  
Plot No.5, Above Idbi Bank,  
Ausa Road, Latur -413512  
Email id – domedalatur@mahaurja.com

WHEREAS [name and address of Contractor] (hereinafter called "the Contractor") has Undertaken, in pursuance of Work Order No.-..... TenderNo.**DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01** for works dated 2020 to design, manufacture, Supply, Installation, Testing and commissioning with five years comprehensive maintenance contract of ON-GRID SPV power plant capacity 24kWp at ITI College, Shirur Anantpal in Latur Dist. 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 (herein after 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 caviler 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.

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

**DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.**

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.

<p>Yours truly,</p> <p>Signature and seal of the</p> <p>Guarantor:</p> <p>Name of Bank/Financial</p> <p>Institution:</p> <p>Address:</p>	
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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**FORMAT-A**

**POWER OF ATTORNEY**

(On Rs100/- stamp paper)

Know all men by these presents, We, ....., Reg. Address:  
..... do hereby irrevocably constitute,  
nominate, appoint and authorize Mr./Mrs./Ms.....,  
Contact No. 91-....., Email.....@..... presently  
employed with us and holding the position of ....., as our true and lawful  
attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such  
acts, deeds and things as are necessary or required in connection with or incidental to participate  
in e-tendering process for e-tender no. **DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-  
22/01** for design, manufacture, Supply, Installation, Testing and commissioning with five years  
comprehensive maintenance contract of ON-GRID SPV power plant capacity 24kWp at ITI  
College, Shirur Anantpal in Latur Dist. In the state of Maharashtra, including but not limited to  
signing and submission of all applications, Bids and other documents and writings, participate in  
Bidders and other conferences and providing information / responses to the Company, representing  
us in all matters before the Company, signing and execution of all contracts including the Contract  
Agreement and undertakings consequent to acceptance of our Bid, and generally dealing with the  
Company in all matters in connection with or relating to or arising out of our Bid for the said  
Project and/or upon award thereof to us and/or till the entering into of the Contract Agreement.  
AND, whereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and  
things done or caused to be done by our said Attorney pursuant to and in exercise of the powers  
conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney  
in exercise of the powers hereby conferred shall and shall always be deemed to have been done  
by us.

For

(Company Name)

Name of signing authority:

Designation: (Owner / Director / Proprietor / Partner)

Place:

Date:

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Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 24kWp AT ITI COLLEGE, SHIRUR ANANTPAL IN LATUR DISTRICT IN THE STATE OF  
MAHARASHTRA.

**FORMAT-B**

**DECLARATION**

(On company letter head)

To,  
General Manager, (Divisional Office Latur)  
Maharashtra Energy Development Agency,  
Shri.Shri.Hights, First Floor, Survey No. 27/A/1,  
Plot No.5, Above Idbi Bank, AUSA Road  
Latur - 413512

Reference: E-tender no. **DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01**

Respected Sir/Madam,

1. We have carefully read and understood all the terms and conditions of the tender and hereby convey our acceptance to the same.
2. The information / documents furnished along with our offer are true and authentic to the best of my knowledge and belief, We are well aware of the fact that furnishing of any false information/ fabricated document would lead to rejection of our tender at any stage besides liabilities towards prosecution under appropriate law.
3. We have apprised our self fully about the job to be done during the currency of the period of agreement and also acknowledge bearing consequences to of non- performance or deficiencies in the services on our part.
4. We have no objection, if enquiries are made about the work listed by us.
5. We have not been barred or blacklisted by any Government Agency /Department/ PSU or any such competent Government authority, organization where we have worked. Further, if any of the partners/directors of the organization /firm is blacklisted or having any criminal case against them, our bid shall not be considered. At any later point of time, if this information is found to be false, General Manager, Divisional Office Latur, Maharashtra Energy Development Agency, may terminate the assigned contract immediately.
6. We have not been found guilty by a court of law in India for fraud, dishonesty or moral turpitude.
7. We agree that the decision of General Manager, Divisional Office Latur, and Maharashtra Energy Development Agency in selection of Bidders will be final and binding to us.

For  
(Company Name)

Name of signing authority / Designation / Place / Date

---

Signature & Seal  
Of Tenderer

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA), LATUR.**

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING WITH FIVE YEARS COMPREHENSIVE MAINTENANCE  
CONTRACT OF ON-GRID SPV POWER PLANTS CAPACITY OF 355KWP AT VARIOUS 13 SITES UNDER SOCIAL WELFARE DEPARTMENT IN NANDED  
DISTRICT IN THE STATE OF MAHARASHTRA.

**FORMAT-C**

**DETAILS OF BANKER**

<b>Sr. No.</b>	<b>Particulars</b>	
1	Name of Bank	
2	Name of Branch / IFSC Code	
3	Account Name	
4	Account No.	
5	Type of Account	

For  
(Company Name)

Name of signing authority / Designation / Place / Date

---

Signature & Seal  
Of Tenderer

**FORMAT-D**  
**BIDDER'S INFORMATION**

Sr. No.	Particulars	
1.	Name of firm	
2.	Details Mailing Address of firm	
3.	Firm Status (PSU / Incorporate / Ltd. / Pvt. Ltd. / LLP / Partnership / Proprietary)	.
4.	Contact Person Name & Designation	
5.	Contact No.	
6.	E-mail Address for correspondence	
7.	Firm Website Address	
8.	Firm Registration No / ROC Establish Year of firm	
9.	PAN No.	
10.	GST No.	
11.	Validity for MNRE Rating (Certificate)	
12.	Turnover (in Rs) 2016-17, 2017-18 & 2018-19	
13.	Company Profile (<100 words)	
14.	Skilled manpower	
15.	Experience in PV Solar Power Generation Plant (<100 words)	
16.	Experience in other Solar Projects (<100 words)	
17.	Solar related Product Range	
18.	Experience in Guarantee, Maintenance & After Sales Services (Years)	
19.	Accreditation / Special achievement, if any by Firm / Bidder	
20.	List of ISI, ISO, Other cert.	

Signature & Seal  
Of Tenderer

**FORMAT-E**  
**DETAILS FOR O & M TEAM**

<b>Sr. No.</b>	<b>Particulars</b>	
1	Name of Concern Authority for Operation & Maintenance / Operation Head for installed System	
2	Contact No.	
3	Email ID	
4	Detailed Address for correspondence (Local Branch office; Separate set-up for Operation & Maintenance, if any)	
5	Details & No. of Qualified & Experience Technical Expert	
6	Details & No. of Skilled Labour	
7	Details & No. of Un-skilled Labour	

**Successful bidder shall have to provide adequate man power & tools-tackles during entire period of CMC.**

**Also, successful bidder shall have adequate insurance, to protect entire system for the period up to the period for CMC.**

For  
(Company Name)

Name of signing authority / Designation / Place / Date

---

Signature & Seal  
Of Tenderer

**FORMAT-F**

**TURNOVER CERTIFICATE**

(On C.A.'s letter head)

This is to certify that, the ..... (Name of Firm) registered as/under.....having registered address .....  
..... and assess to income tax with Circle ...., ... (location) .... and holding IT PAN .....Further, it is certified that, the sales / turnover of the above referred company for the last three years are as under.

<b>Annual Turnover Data for last 3 Years</b> <b>(FY 2017-18, 2018-19&amp; 2019-20)</b>	
<b>Year</b>	<b>Rupees in Lakhs</b>
FY 2017-18	
FY 2018-19	
FY 2019-20	
<b>Total</b>	

We have verified the books of accounts, records and other relevant documents. This certificate has been issued on the basis of data / information produced before us and on the request of the client.

For

(Name of C.A. Firm)

Seal

Name of signing , authority (C.A.)

Place:

Date:

**Note:** Bidders to submit scanned copy of IT returns for last three financial years, supporting with summary of balance sheet / auditor's report, along with above certificate.

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Signature & Seal  
Of Tenderer

**FORMAT-G**

**LIST OF PROJECTS**

(Grid connected PV Solar Power Generation Plants)

<b>Sr. No.</b>	<b>Name of Project</b>	<b>Plant Capacity</b>	<b>Date for commissioning / Current Status of Project</b>

For  
(Company Name)

Name of signing authority / Designation / Place / Date

**Note:** Bidders to submit self attested scanned copies of work / purchase orders supporting with above project list, this is necessary for to review qualifying criteria.

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Signature & Seal  
Of Tenderer

**FORMAT-H**

**SITE VISIT REPORT LETTER**

(To be submitted this report is not compulsory)

To,

Date

General Manager, (Divisional Office Latur)  
Maharashtra Energy Development Agency,  
Shri.Shri.Hights, First Floor, Survey No. 27/A/1,  
Plot No.5, Above Idbi Bank, AUSA Road  
Latur- 413512

**Reference:** E-tender no. **DGM/SOLAR/ITI SHIRUR ANANTPAL/2021-22/01**

**Sub. :** Site Visit Report for installation of 24KWp Grid Connected Solar Power Generation Plant at ITI College, Shirur Anantpal In Latur District in the State of Maharashtra.

Respected Sir/Madam,

This has reference to above referred tender of electrification of 24KWp Grid Connected Solar Power Generation Plant at ITI College, Shirur Anantpal in Latur Dist. in the state of 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 Roof-top structure / 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)

Seal:

Name of bidder's representative visited the site: .....

Designation: .....

**Signature & Seal**

**Authorized Representative,  
ITI College, Shirur Anantpal, Dist. Latur**

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Signature & Seal  
Of Tenderer

**FORMAT-I**  
**DETAILS OF OFFERED SYSTEM**

Sr. No.	Particulars	Capacity (24kWp)
		Quantity
		Make
1.	Module Mounting Structure	
2.	Solar PV modules	
3.	Inverter with Maximum Power Point tracking (MPPT) Charge Controller with inbuilt data Monitoring & safety interlocks	
4.	Array Junction Box	
5.	DC Cables	
6.	Distribution Boards / Panels	
7.	AC Cables	
8.	Lightening Arrestor	
9.	Earthling Equipment	
10.	Net Meter / Bidirectional Meter / Generation meter	
11.	Fire Detection & Protection System / Fire Extinguishers	
12.	Tools & Tackles required for installation, testing, operation & maintenance of entire SPV Systems	

**Note:** Bidders to submit technical Brochure for offered **P V Module & Inverter** along with test certificates / reports compiling applicable Standards as per guidelines issued by MNRE& with details of Guaranty & Warranty. Sub-standard makes or indication of 'Equivalent make' shall strictly be avoided.

Signature & Seal  
Of Tenderer

**FORMAT-I**

**DATA FOR ASSURED POWER GENERATION**

<b>Sr. No.</b>	<b>Power Generation During #</b>	<b>24kWp</b>
1.	Min. total peak hour	
2.	Min. total for 1 <sup>st</sup> year	
3.	Min. total for 2 <sup>nd</sup> year	
4.	Min. total for 3 <sup>rd</sup> year	
5.	Min. total for 4 <sup>th</sup> year	
6.	Min. total for 5 <sup>th</sup> year	
7.	Min. total for 10 <sup>th</sup> year	
8.	Min. total for 15 <sup>th</sup> year	
9.	Min. total for 20 <sup>th</sup> year	
10.	Min. total for 25 <sup>th</sup> year	

**Note:**“#” Energy generation / Power production in (AC) units at application end by offered PV Solar Power Generation Plant; considering ideal conditions / climatic conditions for proposed location; as per reference Data available by various reputed International / GoI institutes.

### **CHECK LIST**

Sr. No.	Particulars	Yes/ No	Page No.
1.	Filled in copy of this " <i>Check List</i> " indicating <i>page nos.</i>		
2.	a) Copy details for <b>Tender document fees</b> b) Copy details for <b>Earnest Money Deposit (EMD)</b> OR <b>Valid exemption certificate issued by competent Govt. authority</b>		
3.	<b>Tender document</b> ( <b>duly stamped and signed</b> by bidder's authorized person <b>on each page</b> )		
5.	<b>Registration Certificate of Firm</b>		
6.	Copy <b>Registration Certificates for GST</b> , Copy of <b>PAN Card</b> , <b>EPF Registration &amp; ESIC Registration</b>		
7.	<b>Power of Attorney</b> (on <b>Rs 100/- stamp paper</b> ) (FORMAT –A)		
8.	<b>Declaration</b> (on company letter head) (FORMAT –B)		
9.	<b>Banker's Details</b> (FORMAT –C)		
10.	<b>Bidder's Information</b> (FORMAT –D)		
11.	Details of <b>O&amp;M team</b> (FORMAT –E)		
12.	<b>C.A. Certificate</b> (on <b>C. A.'s letter head</b> ) (submit copy of <b>IT returns</b> for last three financial years, supporting with <b>summery of balance sheet / auditor's report</b> ) (FORMAT –F)		
13.	<b>List of Project</b> (submit self attested copies of both <b>work order</b> and <b>completion certificate</b> issued by end user / client on their official letter head; refer Section II of Tender, Clause no iii. of 2. for eligibility criteria) (FORMAT –G)		
14.	<b>Site Visit Report</b> ( not mandatory)		
15.	Details of <b>offered system</b> (FORMAT –I)		
16.	<b>Minimum assured power generation</b> from offered system (FORMAT –J)		
17.	Technical Brochure for offered <b>PV Module</b> (Along with essential test certificates / reports compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranty & Warranty)		
18.	Technical Brochure for offered <b>Inverter</b> (Along with essential test certificates / reports compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranty & Warranty)		

**Note:**

- Above information / documents are to be uploaded / annexed as a **SINGLE PDF** in prescribed format (Refer Format A to J) in above **SEQUENCE**.
- Bid without any of above document is liable for rejection.**
- Upload necessary documents only, so as to restrict Bid with maximum 200 pages; **readable scanned file for resolution not less than 100dpi.**
- Submit financial BID separately.**

1.	<b>Part-B</b>	Separate duly filled soft copy of Excel file "BOQ" for financial bid shall be uploaded	
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Signature & Seal  
Of Tenderer

Signature & Seal  
Of Tenderer

