E-TENDER FOR

Design, Manufacture, Supply, Installation, Testing and Commissioning with Five Years Comprehensive Maintenance Contract of Grid Connected Roof Top Solar PV System with Remote Monitoring system at various sites of JJ Hospital, Mumbai, Maharashtra Cumulative capacity - 160KWp

Name of sites and capacity of plants are:

a) C.J Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity – 20 kWp (2 x 10KWp)-for two consumer

b) Skin Building, Ward 43

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity- 20KWp (2 x 10KWp) - for two consumer

c) Balaram Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra capacity-40KWp

d) Main Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity- 30KWp

e) OPD Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity -30KWp

f) PWD Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity-20KWp

Tender Reference No.: MEDA-DIVMU/JJ/2020-21

SECTION-I

BID INVITATION

Brief Description of Tender Process

- **Divisional General Manager, Maharashtra Energy Development Agency, Divisional office Mumbai,** 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.

  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.

BIDDING INFORMATION

1	Tender Reference No.	**MEDA-DIVMU/JJ/2020-21**
2	Tender can be downloaded	Between 20th August 2020 15:00 Hrs to 11th September 2020; 15:00 Hrs
3	Estimated Cost	**Rs. 93,45,600** (79,20,000 + 18% GST = 93,45,600)
4	Tender document fee	**Rs. 17,700**/-(15,000+18%GST=**17,700**/-)
5	Earnest Money Deposit (EMD)	**Rs. 1,77,000**/- (1,50,000+18%GST)
6	Date & Time of Pre Bid Meeting	All participants are requested to send their queries, if any, on or before 27th August 2020 up to 14:00 Hrs at email: dgmmumbai@mahaurja.com Pre bid meeting –27th August 2020 14:00 Hrs at MEDA, Div. office Mumbai
7	Last date & Time for submission of Bid	September 11th, 2020 at 15:00 Hrs.
8	Date & Time of opening Technical Bid	September 14th, 2020 at 15:00 Hrs.
9	Security Deposit	3% of the Project Cost and Demand Draft in favor of Maharashtra Energy Development Agency Divisional Office Mumbai
10	Address for communication and Venue for Tender opening	Divisional General Manager, (Divisional Office Mumbai) Maharashtra Energy Development Agency, 1012-A, 10th Floor, Embassy Centre, Nariman Point Mumbai, Maharashtra - 400021, Phone No: 022 – 22876436, E-mail ID: - dgmmumbai@mahaurja.com

- 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 G o M: https://mahatenders.gov.in

SECTION-II

INFORMATION AND INSTRUCTION TO BIDDERS

Divisional General Manager, Divisional office Mumbai, Maharashtra Energy Development Agency, 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 Contract of:

a) C.J Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity – 20 KW (2 x 10KWp)-for two consumer

b) Skin Building, Ward 43

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity- 20KWp (2 x 10KWp)- for two consumer

c) Balaram Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra capacity-40KWp

d) Main Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity- 30KWp

e) OPD Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

Capacity -30KWp

f) PWD Building

JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity-20KWp

Mumbai, Maharashtra (Herein after referred to as the contract of works) and as described in the tender document on **'Turnkey Contracts'** under Tender No: **MEDA-DIVMU/JJ/2020-21**

1. Scope of Work

The Scope of work is as below:

- Design, Manufacture, Supply, Installation, Testing and Commissioning with Five Years Comprehensive Maintenance Contract of
- C.J Building:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity - 20KW (2 x 10KWp)-for two consumer
- Skin Building, Ward 43:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Capacity- 20KWp (2 x 10KWp)- for two consumer
- Balaram Building:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra capacity- 40KWp
- Main Building:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Capacity- 30KWp
- OPD Building:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Capacity -30KWp
- PWD Building:

  JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra – Capacity-20KWp

Mumbai, Maharashtra, on 'Turnkey Contract' and as described in the tender 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.

- 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.
- **Time is the essence in completing the Work:** The successful Bidder will be required to complete the work within the stipulated time as specified in the tender document.
- The bidder shall ensure that SPV power plant should be commissioned within **180 Days** from the date of issue of work order. Bid 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 bidder's 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.
- Partial bid or bid which does 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 Criteria:

The bidder shall provide sufficient documentary evidences to satisfy the following conditions, that the bidder:

- They should provide valid registration certificate (approval) issued by MNRE and IEC certificate of SPV Module & Inverter and test report from authorized test centre of MNRE, GoI or Bidder should be registered with MEDA under the MH-GCRT Program Or shall be valid MNRE Channel Partner.

- Shall manufacture/supply the material (module, inverter & battery) only as per the standards mention in tender document.
- The Bidder should have installed & commissioned 20 KW capacity single and 160 KW cumulative Grid-connected roof top net metering system projects. The list of project commissioned has to be submitted along with the tender. The copy of the Commissioning certificate and Work order / Contract / Agreement / from the Client / Owner shall be submitted. MEDA reserves right to ask for generation report.
- Is a manufacturer of SPV system or System Integrator and shall provide the test certificate of SPV system issued by MNRE or its authorized test centers.

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

- Must have field service setup to provide goods after sale services including necessary repair and maintenance in the state of Maharashtra, to carry out repair/replacement work within 48 hours from the time of reporting the fault as and when required over the period of 5 years i.e. CMC period. Registered Office, service and dealership network in Jurisdiction of Maharashtra is must. Accordingly bidder has to submit the details thereof.
- Bidder must submit the address, company personnel details of registered office in Maharashtra State which will be responsible for conducting O&M within the CMC period briskly.
- **Joint venture/consortium/subcontract/subletting is not permitted**.
- Must have turnover of minimum 1 Crores during last three financial years (i.e. 2017-18, 2018-19 & 2019-20). The Bidder has to submit Balance sheet and certificate duly certified by Chartered Accountant in support of the claim.

3. Standards / Certificates

- The material/ equipments/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.

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**.
- Joint Venture is not permitted.
- The bidder should visit the site &should conduct technical survey along with concerned person of user agency.
- 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 Bid submitted by bidders for detailed scrutiny. During evaluation of the technical bids, MEDA may at its discretion ask the bidders for clarification.
- In case bidder does not fullfil 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.
- **Bid submitted without EMD will be rejected**. Bidder would need to upload the required documents through electronic mode only.
- For any Clarification /onlinesupport please contact at mail id dgmmumbai@mahaurja.com
- MEDA reserves the right
    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.
    3. 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 only. Supporting documents and printed literature furnished by the bidder if provided in another language 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 in tender

The tender prepared by the Bidder shall be uploaded in two parts:

a) Technical Bid

b) Financial Bid

Part I - Technical Proposal:

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

Sr. No.	Particulars
1	Copy of receipt of tender fee
2	Copy of receipt for EMD
3	Duly stamped and signed Tender Document (E-Sign is permitted)
4	Industry /Firm/Company registration certificate (MSME allowed). Valid certification of Manufacturer/ Distributor/ Dealer required as per Eligibility Criteria.
5	Copy of PAN Card
6	Copy of GST registration
7	Power of attorney; for company's authorized person (Refer Format – A)
8	Self-Certification of No Barr/non failure/blacklisted (Refer Format – B)
9	Bank details of bidder (Refer Format - C)
10	Bidder's Information Sheet (Refer Format - D)
11	Details of set-up for after sales service (Refer Format - E)
12	Financial credentials of bidder (Refer Format - F), along with: 1. Scanned copy of IT returns for last three financial years, supporting with 2. Summary of balance sheet / auditor's report. Only profit making organizations are eligible. 3. Overall Average Annual Turnover of the Company/Firm/ Corporation in the last three financial years should be at least **Rs.1 Crores** (Rupees One Crores 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)
13	Experience for installation and commissioning of SPV power plants / list of projects (Refer Format - G). Along with : a) Scanned copies of work / purchase orders received for completed projects and performance reports from beneficiary along with RMS Details. Incomplete Work Orders/ Purchase orders will not be accepted. b) The Bidder should have installed & commissioned 40 kW capacity single and minimum 20 kW cumulative Grid-connected roof top net metering system projects. The list of projects commissioned has to be submitted along with the tender. The copy of the Commissioning certificate and Work order / Contract / Agreement / from the Client / Owner shall be submitted. MEDA reserves right to ask for generation report. c) 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.]
14	Site visit report (Refer Format – H) **Note: Individual report should be submitted for all the mentioned sites.**
15	Details of proposed / offered system (Refer Format - I) **Note: Individual report should be submitted for all the mentioned sites.**
16	Details for output / power generation – assumed & assured from proposed / offered system (Refer Format - J). **Note: Individual report should be submitted for all the mentioned sites.**
17	Brochure for offered solar systems along with test certificates compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranties & Warranties.
18	Manufacture/supply the material (module & inverter) only as per standards mention in tender document (Annexure – A). **Should provide valid IEC certificate of SPV Module & Inverter and test report from authorized test center of MNRE, GoI.**
19	Format of Commitment from the Bidder

The Bidder is expected to follow 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:

1. The bidder should quote the price as against total tender estimate as shown in the tender document.
2. 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.
3. Prices shall be quoted in Indian Rupees only.
4. In no circumstances, escalation in the prices will be entertained.
5. 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) and forfeiting of EMD

A) Earnest Money Deposit:

The Earnest Money Deposit 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.

In above event, 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.

If the Bidder fails / refuses to execute the contract, MEDA shall have full right to claim damages thereof in addition to the forfeiture of EMD

C) SECURITY DEPOSIT:

1. The Bidder shall furnish security deposit at 3% of the total contract value within 10 days from the date of issue of work order (including Sunday and public holiday)by way of demand draft of nationalized bank in favor of Maharashtra Energy Development Agency, payable at Mumbai.

2. Failure to comply with the terms of security deposit shall result into cancellation of work order without any further reference to the Bidder and the EMD shall be forfeited.

3. 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.

4. In case of premature termination of the contract, the security deposit will be forfeited and 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.

5. 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.

6. The security deposit shall be released to the Bidder after completion of 5 years of CMC satisfactorily. Also Bidder has to give the guaranteed generation for 5 years at available solar radiation. If systems produce less generation below guaranteed generation then penalty of Rs. 6/- per unit will be charged from your Security Deposit and will be released accordingly.

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.

In the event, bidder offers price less than 80% of estimated cost indicated in this tender document; for such offer, bidder must have to pay tender fee, EMD & additional security deposit as per Government Resolution number. **No exemption in tender fee &**

EMD shall be allowed for such 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, completion and CMC period, all the matter will be resolve under Mumbai Jurisdiction only.

11. Period of Validity of Bid

- Bids shall remain valid for 180 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 thereto shall be made in writing. The EMD provided shall also be suitably extended. A Bidder granting the request will not be 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. Clarification of Bids

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

14. Pre Bid Meeting:

Pre bid meeting shall be called at office of Maharashtra Energy Development Agency, Divisional Office Mumbai 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.

15. Acceptance or Rejection of Bids

- MEDA reserves the right to accept or reject any bid or all the bids and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability or any obligation to inform the affected bidder or bidders of the grounds for the said action.
- Any Bid with incomplete information is liable for rejection.
- For each category of pre-qualification criteria, the documentary evidence is to be produced duly attested by the authorized representative of the bidder and serially numbered. If the documentary proof is not submitted for any/all criteria the Bid is liable for rejection.
- If any information given by the bidder is found to be false/ fictitious, the Bidder will be debarred for 3 years from participating in any other tenders of MEDA and will be black listed.

16. Criteria for Bids evaluation

Technical Evaluation

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

Financial Evaluation

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

- At the outset, the price bids of all the Bidders who are technically qualified in technical evaluation shall be opened

- 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.

- Bidder that has quoted the lowest price (inclusive of all the taxes/duties) without breaching 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 whoever qualifies in the complete process as mentioned above.

17. Award Criteria and Award of Contract

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

18. Corrupt or Fraudulent Practices

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

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

- will declare a firm ineligible for a period of 3 years, if it at any time it determines that the firm has engaged in corrupt or fraudulent practices in competing for awarded work at Government financed contract, or in executing, a contract

19. Terms of Payment:

a. 60% of the total cost will be released after supply, installation & successful commissioning of the systems duly certified by Bidder, Officer of MEDA & authorized person of Beneficiary along with Geo-tagging Photographs of the system and system components and with all technical test reports of system and system components along with submission of Insurance policy documents effective from date of commissioning for CMC period.
b. 20% of the total cost shall be released on receipt of one month successful performance report generated automatically through Remote Monitoring System.
c. 20% of the total cost shall be released on submission of next two month successful performance report in prescribed format generated automatically through Remote real time Monitoring System as well as manually which should be duly certified by Officer of MEDA, authorized person of Beneficiary and submission of Performance Bank Guarantee of 15% of total project cost from any Nationalized Bank valid for period of 5 years and submission of Guarantee and Warrantee cards to the beneficiary.

Deduction:-

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

ii. MEDA will issue necessary certificates of TDS deduction

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.

20. TIME FRAME:

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

21. 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 0.5% (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 amount required will be deducted from the balance amount of the previous successful bidder.

SECTION – III

General Terms and Conditions

General Terms and Conditions:

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

a) Joint Venture is not permitted.

b) 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.

c) The Bidder should provide appropriate tools and equipment's to the workmen and ensure that those are in proper working condition and the workmen use the appropriate tools and take precaution "PLEASE NOTE THAT ANY ACCIDENT TO THE WORK MEN / PUBLIC / ANIMALS / PROPERTY BOTH MOVABLE AND IMMOVABLE SHALL BE ENTIRE AND SOLE RESPONSIBILITY OF THE BIDDER AND ANY PROCEEDING ARRISING OUT OF THE SAME SHALL BE AT THE BIDDER'S RISK AND COST, MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA) OR ITS EMPLOYEES WILL NOT BE RESPONSIBLE FOR ANY SUCH INCIDENT".

d) 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.

e) 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.

f) The Bidder shall carry out the work strictly according to the technical specifications and complete the work within stipulated time.

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

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

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

i) In the event of any discrepancy observed in specifications, the specifications given by MEDA will be final. In the event of dispute arising any time, related to this work and document, decision of the Divisional General Manager, MEDA 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 balance amount of 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 center of MNRE. Bidder shall provide the facilities for getting the sample tested & the supplier shall bear the cost for the same.

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

n) At the time of inspection, 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 is the responsibility of the Bidder to ensure satisfactory performance of the system throughout CMC Period.

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 and Service Engineer.

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 thereof or any law relating thereto and rules made there under from time to time.

s) If previous performance of any Bidder is 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 Divisional 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 Divisional General Manager, MEDA shall be final.

v) The Divisional 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 Divisional 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

complete the work and also fulfill tender conditions, subject to L2 bidder accept the work at L1 price.

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

aa) Net Metering Policy: Bidder has to comply with Net Metering policy in the state and bidder has to complete all formalities towards net metering application and any load enhancement.

2) Communications

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

- Project review coordination meetings between the Beneficiary, MEDA's Representative and Contractor shall be conducted on a regular basis or as and when required by the MEDA, at locations decided by the MEDA, for work 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 work order issuing authority and mutually agreed between Contractor / Agency and work order issuing authority.

- MEDA shall not be responsible for any loss or damage of any material when installing SPV power plants.
- Undertake necessary activities during the warranty period as set out in this Contract.
- It is the responsibility of successful bidder to make the insurance of SPV system from the date of commissioning 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, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/ Indian Standards and as detailed in the Technical specifications Section as per the MNRE / MEDA requirements of the bid document and Annexure- A. The goods supplied under this contract shall confirm to the Standards mentioned, where appropriate Standards and Codes are not available, other suitable standards and codes as approved by the authoritative Indian Standards shall be used.

6) Inspection:

- Successful bidder to submit the design engineering documents, Calculations & Drawings within a weeks' time after issue of work order for review & approve by MEDA.
- The projects will be inspected for quality at any time during commissioning or after the completion of the project 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 MEDA certifies in writing.

- 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, shall be specified in the contract, shall be arranged by the Contractor / Agency, and the contract price shall include transportation costs.

8) Assignment

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

9) Sub-contracts

Subcontract is strictly prohibited (Turnkey i.e. E.P.C. as well as C.M.C.).

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 E-mail , 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 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 climatic temperatures during transit and open storage.
- Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods final destination and the absence of heavy handlings facilities at all points in transit.
- The packing, marking and documentation within and outside the item shall comply strictly with such special requirements as shall be provided for in the contract including additional requirements, if any and in any subsequent instructions ordered by the MEDA.

14) 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 8 Danger Notice Plates at each project site of 200mmX 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 each site for SPV power 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, and 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.

18) Warranties and Guarantees:

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

SECTION-IV

TECHNICAL SPECIFICATIONS OF SPV POWER PLANT

On-grid 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 and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable. Capacities of all important components should be equal or greater than the capacity of respective Solar PV Plant.

Available Shadow free Space and **GPS Co-ordinates**

a) **C.J Building**
   20 kWp (2 x 10KWp) **– (2000 Sq Ft for two meters)**
   Latitude: 18.9631542; Longitude: 72.8319003
   JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra
b) **Skin Building**, Ward 43
   20 kWp (2 x 10KWp**) (2000 Sq Ft for two meters)**
   Latitude: 18.9635; Longitude: 72.8325
   JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra
c) Balaram Building
   40KWp **(4000 Sq Ft)**
   Latitude: 18.96320; Longitude: 72.83528
   JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra
d) Main Building
   30KWp **(3000 Sq Ft)**
   Latitude: 18.96320; Longitude: 72.83528
   JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra
e) OPD Building
   30KWp **(3000 Sq Ft)**
   Latitude: 18.962769; Longitude: 72.834614
   JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra
f) PWD Building
   20KWp **(2000 Sq Ft)**
   Latitude: 18.9635; Longitude: 72.8325
   JJ Hospital Road Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra

General Information

1. The operating life of the plant shall be minimum 25 years.

2. 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.

3. 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.

4. The individual Solar PV array shall be installed on existing roof top of the building using **fixed PV array support structure.**

5. The individual string / array combiner boxes and DC cabling shall be installed on roof top of the building.

6. The inverter shall be installed in the control room / open space provided in the building.

7. 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 total solar PV array capacity should not be less then mentioned Plant capacity in tender; comprise of solar polycrystalline modules with minimum capacity of 300Wp and above wattage. Module capacity less than minimum 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.

4. Individual PV modules rating should be of minimum 300 Wp at STC.

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 may be.

6. A suitable number of Solar PV modules shall be connected in a series string. A suitable number of series strings shall be connected in parallel to formulate a series parallel array.

7. The PV Array shall be designed to match the inverter input specifications.

8. The module shall be provided with junction box with provision of min. 3 Nos. of by-pass diodes and external MC4 type or equivalent plug-in connectors. The junction box should have hinged / 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.

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 25^0C, 45^0C, 60^0C and at NOC are required to be furnished. Offers to provide PV module warranty of 25 years with not more than 20% degradation in performance/output over 25 years.

15. The PV module must have 10 years free replacement guarantee against material defect or craftsmanship. 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, Im, Vm, FF for the module; unique serial no & model no; date & year of obtaining IEC PV module qualification certificate are required to be furnished.

Note: (Online site visit is permitted due to Covid 19 situation)

Warranties:

1) **Material Warranty:**

i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (05) years from the date of sale to the original customer ("Customer")

ii. Defects and/or failures due to manufacturing

iii. Defects and/or failures due to quality of materials

iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option

2) **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 (Grid connected)

The PCU required should be according to the plant capacity; to convey DC power produced by SPV modules into AC power and adjust the voltage & frequency levels to meet the local grid conditions.

Common Technical Specification

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) forindoor IP-65(Minimum) for outdoor

PCU efficiency: 98% and above at full load.

PF: > 0.9

Other important Features/Protections of PCU:

1. Mains (Grid) over-under voltage and frequency protection.
2. Over load capacity (for 10 sec) should be 200% of continuous rating.
3. The PCU shall be self-commuted and shall utilize a circuit topology and components suitable for meeting the specifications listed above at high conversion efficiency and with high reliability.
4. The PCU shall be provided with MPPT (Maximum Power Point Tracing) features, so that maximum possible power can be obtained from the PV module.
5. The PCU shall be self-commuted and shall utilize a circuit topology/ DSP technology to meet the specifications listed above at high conversion efficiency and with high reliability. The PCU shall 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 centres / NABL /BIS / IEC accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.
10. The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line-to-ground fault currents.

11. The PCU shall be able to withstand an unbalanced output load to the extent of 50%.
12. The PCU shall go to the shutdown/standby mode with its contacts open under the following conditions before attempting and automatic restart after an appropriate time delay in insufficient solar power output.
13. (a) **Utility-Grid Over or Under Voltage**

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

    (b) **Utility-Grid Over or Under Frequency**

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

    (c) The PCU shall not produce Electromagnetic interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the PCU is housed.
14. Communication Modbus protocol with LAN / WAN options along with remote access facility and PLC 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
20. Efficiency normally more than 97%, and transformer efficiency is normally more than97%)
21. The kVA ratings of inverter should be chosen as per the PV system wattage.
22. The output power factor should be of suitable range to supply or sink reactive power.
23. inverter shall provide panel for display of PV array DC voltage, current and power,
24. AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive

25. and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and
26. Frequency Remote monitoring of inverter parameters should also be available.
27. The inverter shall include adequate internal cooling arrangements (exhaust fan and Ducting) for operation in a non-AC environment.

Factory Testing:

1. The PCU shall be tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service, prior to its shipment.
2. Operation of all controls, protective and instrumentation circuits shall be demonstrated by direct test if feasible or by simulation operation conditions for all parameters that cannot be directly tested.
3. Special attention shall be given to demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.
4. Operation of startup, 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 SPV power plants shall be provided with lightning & over voltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc the entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning

Arrestors. Lightning protection should be provided as per NFC 17-102:2011 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

SURGE PROTECTION

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

Earthing

1. PV array, DC equipment, Inverter, AC equipment and distribution wiring shall be earthed as per IS: 3043 - 1987.

2. Equipment grounding (Earthing) shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV panel mounting structures in one long run. The grounding wire should not be switched, fused or interrupted.

3. The complete earthing system shall be electrically connected to provide return to earth from all equipment independent of mechanical connection.

4. The equipment grounding wire shall be connected to PV power plant.

5. A separate grounding electrode shall be installed using earth pit per power plant. Test point shall be provided for each pit.

6. An earth bus and a test point shall be provided inside each control room.

7. Earthing system design should be as per the standard practices.

CABLES & WIRES

- Cabling in the yard and control room: Cabling in the yard shall be carried out as per IE Rules. All other cabling above ground should be suitably mounted on cable trays with proper covers, 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 'he purchaser prior to installation. All cable tests and measurement methods should confirm to IEC 60189.

Electrical Safety

- Internal Faults: In built protection for internal faults including excess temperature, commutation failure, and overload and cooling fan failure (if fitted) is obligatory.
- Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations and internal faults in the power conditioner, operational errors and switching transients.
- Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.
- Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in GL trays with covers for protection.
- Fast acting semiconductor type current limiting fuses at the main bus bar to protect from the grid short circuit contribution.
- The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- The PCU shall include ground lugs for equipment and PV array grounding.
- All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years design life of the unit.
- The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU intact under all conditions in the room where it will be housed. The INVERTER shall be located indoor and should be either wall / padmounted. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.
- Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.
- All doors, covers, panels and cable exits shall be gasket or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings no larger than 0.95 cm. (about 3x8 inch).

In the design and fabrication of the PCU the site temperature (5° to 55°C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

EARTHING PROTECTION

- Each array structure of the PV yard should be grounded properly. In addition the lighting arrester/masts should also be provided inside the array field.
- Provision should be kept be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work.
- All metal casing/shielding of the plant should be thoroughly grounded in accordance with Indian electricity Act. /IE Rules. Earth resistance should be tested in presence of the representative of NRHM after earthing by calibrated earth tester. PCU ACDB & DCDB should be earthed properly.
- Danger boards should be provided as and where necessary as per IE Act/IE rules as amended up to date. Three signage shall be provided one each at battery – cum- control room, solar array area and main entry from administrative block

Civil

- For structural purpose, the panels plus support system that works as a distortion-free integral structural unit.
- 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.).
- PV array shall be installed in the space free from any obstruction and / or shadow.
- PV array shall be installed utilizing maximum space to minimize effects of shadows due to adjacent PV panel rows. The gross weight of the panel assembly should at most 45 kg/sq m (W divided by the plan area).
- 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).
- 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. The plan dimension of pedestal does not exceed 450mm x 450 mm, and height does not exceed 300mm.

- Ample clearance shall be provided in the layout of the inverter and DC / AC distribution boxes for adequate cooling and ease of maintenance.
- 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;

  d. Interconnection details inside the junction/terminal boxes; e. Structure installation details and drawings; f. 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 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.

L) Array Structure

- Hot dip galvanized (minimum of 120 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.
- 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.
- The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.

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

Electrical Safety

- Internal Faults: In built protection for internal faults including excess temperature, commutation failure, over load and cooling fan failure (if fitted) is obligatory.
- Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations and internal faults in the power conditioner, operational errors and switching transients.
- Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.
- Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in GL trays with covers for protection.
- Fast acting semiconductor type current limiting fuses at the main bus bar to protect from the grid short circuit contribution.
- The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- The PCU shall include ground lugs for equipment and PV array grounding.
- All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years design life of the unit.
- The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU intact under all conditions in the room where it will be housed. The INVERTER shall be located indoor and should be either wall / pad mounted. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.
- Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.
- All doors, covers, panels and cable exits shall be gasket or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall

be provided with grills or screens with openings no larger than 0.95 cm. (about 3x8 inch).

- In the design and fabrication of the PCU the site temperature (5° to 55°C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

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. 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.

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.

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 aluminum or equivalent metal sections.

4. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.

5. The support structure shall be free from corrosion when installed.

6. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasters shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners / clamps shall be adequately treated to resist corrosion/ stainless steel.

7. The support structure shall withstand wind loading of up to 150 km/hr.

8. Adequate spacing shall be provided between any two modules secured on panel assembly for improved wind resistance.

9. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.

10. It is required to design the grid structure (on which PV module will be installed) in such a way that all loads are transferred to the existing columns of the buildings. Such grid design should be presented to MEDA, which will be certified by structural engineers.

11. The panel assembly structure should be installed in a manner to leave sufficient space for repair and maintenance aspects of the roof tops, particularly for leakages.

12. Installation of panel assembly should not tamper with the water proofing of roofs

ARRAY STRUCTURE

a) Hot dip galvanized (minimum of 150 Microns) MS mounting structures may be used for mounting the modules / panels / arrays. Each structure should have angle of inclination as per the site conditions to take maximum insolation. However to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

b) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. Suitable fastening

arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.

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

d) Structural material shall be corrosion resistant and electrolytically 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 need to be provided either by coating or anodization.

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

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

Electrical:

1. LT distribution grid specifications 415V +/- 5%, 50Hz and frequency variation as per IE rules.

2. The output of the inverter shall be fed into 415V, 3 phase AC LT grid supplied via LT MCCB.

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.
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 ensured by the supplier.

14. Disconnection and Islanding: Disconnection of the PV plant in the event of loss of the main grid supply is to be achieved by in built protection within the power conditioner; this may be achieved through rate of change of current, phase angle, unbalanced voltage or reactive load variants.

15. Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are : Neutral voltage displacement Over current Earth fault and reverse power in case of the above, cases, tripping time should be less than (15 seconds Response time in case of grid failure due to switch off or failure based shut down should be well within seconds. In case of use of two PCUs capacity suitable equipment for synchronizing the AC out put of both the PCUs to the ACDB/Grid should be provided.

    Automatic reconnection after the grid failure should restore.

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

Operating Environment

1. Temperature: 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 150 km/hr.

6. Corrosion : high
7. Dust : moderate to high
8. Bird Interference : high
9. Bird Droppings : frequent and large
10. Trees: large and in abundance

CONNECTIVITY

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

Plant Capacity	**Connecting voltage**
Up to 10 kW	240V-single phase or 415V-three phase at the option of the consumer
Above 10kW and up to 100 kW	415V – three phase
Above 100kW	At HT/EHT level (11kV/33kV/66kV) as per DISCOM rules

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 they meet the specifications.

Plant Power Performance Ratio Testing

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance to

qualify for release of applicable incentive. Minimum CUF of 15% should be maintained for a period of 5 years. Correction shall be applied based on available solar radiation.

Plant Energy Performance Ratio Testing

The overall energy performance ratio of the system shall exceed 75%. (Sum total of the system energy losses shall not exceed 25%). For global solar insolation in the Plane of Array

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.
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.

2. 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 5 years.

(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 25 years.

(iii) During the CMC period, MNRE / MEDA / 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 center. If during such tests any part is not found as per the specified technical parameters, MEDA will take the necessary action. The decision of MEDA in this regard will be final and binding on the bidder.

Warranties and Guarantees

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

Standards and Compliance

1. IEC 60364-7-712: Electrical Installations of Buildings: Requirements for Solar PV power supply systems.
2. IEC 61727 or similar: Utility Interface Standard for PV power plants > 10 kW.
3. IEC 62103, 62109 and 62040 (UL 1741): Safety of Static Inverters – Mechanical and Electrical safety aspects.
4. IEC 62116: Testing procedure of Islanding Prevention Methods for Utility-Interactive PV Inverters.
5. PV Modules : IEC 61730- Safety qualification testing, IEC 61701 – Operation in corrosive atmosphere
6. IEC 61215 : Crystalline Silicon PV Modules qualification
7. String/array junction boxes : IP65, Protection Class II, IEC 60439-1, 3.
8. Surge Protection Devices: Type 2, DC 1000V rated.
9. PV module / string / string combiner box interconnects: MC4 compatible. DC 1000V rated.
10. The central inverter shall be rated for IP64.
11. The DC/AC distribution boxes shall be rated IP64.
12. The data acquisition systems shall be rated for IP64.
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.

TECHNICAL DETAILS

PV MODULE

i. Indigenously manufactured PV modules should be used.

ii. The power output of the module under STC should be a minimum of 300Wp.

iii. The PV module should be made up of crystalline silicon solar cells and must have a certificate of testing conforming to IEC 61215 Edition II / BIS 14286 from an NABL or IECQ accredited Laboratory.

The module efficiency should not be less than 12 %.

iv. The terminal box on the module should have a provision for opening, for replacing the cable, if required.

v. There should be a Name Plate fixed inside the module which will give:

a. Name of the Manufacturer or Distinctive Logo.

b. Model Number

c. Serial Number

d. Year of manufacture

viii. A distinctive serial number starting with NSM will be engraved on the frame of the module or screen printed on the tedlar sheet of the module.

*****The Load voltage conditions of the PV modules are not applicable for the system having MPPT.

Annexure- A

QUALITY CERTIFICATION, STANDARDS AND TESTING

SOLAR PV SYSTEMS/ POWER PLANTS

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:

Solar PV Modules/Panels	
IEC 61215/ IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61646/ IS 16077	Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules
IEC 62108	Design Qualification and Type Approval for Concentrator Photovoltaic (CPV) Modules and Assemblies
IEC 61701- As applicable	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
EC 62716	Photovoltaic (PV) Modules – Ammonia (NH3) Corrosion Testing (**Advisory - 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
IEC 62804 (Draft Specifications)	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation (PID). IEC TS 62804-1: Part 1: Crystalline silicon **(Mandatory for system voltage is more than 600 VDC and advisory for system voltage is less than 600 VDC)**
IEC 62759-1	Photovoltaic (PV) modules – Transportation testing, Part 1: Transportation and shipping of module package units
Solar PV Inverters	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)
IEC/IS 61683 **(For stand Alone System)**	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
BS EN 50530 (Will become IEC 62891) **(For Grid Interactive system)**	Overall efficiency of grid-connected photovoltaic inverters: This European Standard provides a procedure for the measurement of the accuracy of the maximum power point tracking (MPPT) of inverters, which are used in grid-connected photovoltaic systems. In that case the inverter energizes a low voltage grid of stable AC voltage and constant frequency. Both the static and dynamic MPPT efficiency is considered.
IEC 62116/ UL 1741/ IEEE 1547	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 (1, 2, 14, 27, 30 & 64)	Environmental Testing of PV System – Power Conditioners and Inverters
IEC 61000- 2,3,5	Electromagnetic Interference (EMI), and Electromagnetic Compatibility (EMC)

	testing of PV Inverters (as applicable)
Fuses	
IS/IEC 60947 (Part 1, 2 & 3), EN 50521	General safety requirements for connectors, switches, circuit breakers (AC/DC)
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
Surge Arrestors	
IEC 61643-11:2011 / IS 15086-5(SPD)	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low- voltage power systems – Requirements and test methods
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC cables
Earthing /Lightning	
IEC 62561 Series(Part 1,2 &&) (Chemical earthing)	IEC62561-1 Lightning protection system components (LPSC) - Part 1: Requirements for connection components IEC62561-2 Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes IEC 62561-7 Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	Junction boxes and solar panel terminal boxes shall be of the thermo plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use
Energy Meter	
IS 16444 or as specified by the DISCOMs	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2 — Specification (with Import & Export/Net energy measurements)
Solar PV Roof Mounting Structure	
IS 2062/IS 4759	Material for the structure mounting

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

Annexure- B

Sample / Standard Format for PERFORMANCE BANK GUARANTEE

To,

Divisional General Manager, (Divisional Office Mumbai)

Maharashtra Energy Development Agency,

1012-A, 10th Floor, Embassy Centre, Nariman Point Mumbai, Maharashtra

400021, Phone No: 022 – 22876436,

E-mail ID: - dgmmumbai@mahaurja.com

WHERES _____ [name and address of contractor] (herein called "the Contractor") has undertaken in pursuance of work order no. _____ **Tender No. MEDA-DIVMU/JJ/2020-21 for works _____,** dated _____ 2020 to design, manufacture, supply, installation, testing and commissioning with five years comprehensive maintenance contract of

a) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra C.J Building - 20KW (2 x 10KWp)

b) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Skin Building, Ward 43 -20KWp (2 x 10KWp)

c) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Balaram Building-40KWp

d) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Main Building- 30KWp

e) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra OPD Building- 30KWp

f) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra PWD Building- 20KWp

(hereinafter referred to as the contract of works) and as described in the Bidding Data in Maharashtra State for works under single point responsibility **"Turnkey Contracts"** basis (hereinafter called "the **Contract**");

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

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

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

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

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

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. **MEDA-DIVMU/JJ/2020-21** Design, Manufacture, Supply, Installation, Testing And Commissioning With Five Years Comprehensive Maintenance Contract of 160kWp SPV Power Plant (with/ without elevated structure), at

a) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra C.J Building - 20KW (2 x 10KWp)

b) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Skin Building, Ward 43 -20KWp (2 x 10KWp)

c) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Balaram Building-40KWp

d) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Main Building- 30KWp

e) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra OPD Building- 30KWp

f) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra PWD Building- 20KWp , 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, we hereby agree to rectify 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:

Format - B

DECLARATION

(On company's letter head)

To,

Divisional General Manager, (Divisional Office Mumbai)
Maharashtra Energy Development Agency,
1012-A, 10th Floor, Embassy Centre, Nariman Point Mumbai, Maharashtra
400021, Phone No: 022 – 22876436,
E-mail ID: - dgmmumbai@mahaurja.com

Reference: E-tender no. **MEDA-DIVMU/JJ/2020-21**

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, Divisional General Manager, Divisional Office Mumbai, Maharashtra Energy Development Agency, may terminate the assigned contract immediately.

6. We have not been found guilty by court of law in India for fraud, dishonesty or moral turpitude.

7. We agree that the decision of Divisional General Manager, Divisional Office Mumbai, 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

Format - C

BANK DETAILS

Sr. No.	**Particulars**	
1	Name of Bank	
2	Name of Branch/ IFSC Code	
3	Account Name	
4	Account Number	
5	Type of Account	

For

(Company Name)

Name of signing authority / Designation / Place / Date

Format – D

BIDDER'S INFORMATION

Sr. No.	Particulars	Description
1	Name of Firm	
2	Detailed 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 year) [for last 3 years]	
13	Company Profile (<100 words)	
14	Skilled Manpower	
15	Experience in SPV Power 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 achievements, if any by Firm/ Bidder	
20	List of ISI, ISO, other cert.	

Format – E

DETAILS FOR O & M TEAM

Sr. No.	Particulars	
1	Name of Concern Authority for Operation & Maintenance/ Operation Head for Installed System	
2	Contact No. (Landline and Mobile No.)	
3	Email Id.	
4	Detailed Address for correspondence (Local Branch Office; Separate setup for Operation & Maintenance, if any)	
5	Details & No. of Qualified & Experienced Technical Experts	
6	Details & No. of Skilled labour	
7	Details & No. of Unskilled 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

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.

Annual Turnover Data for last 3 Years (FY 2017-18, 2018-19 and 2019-20)	
Year	**Rupees in Lakhs**
FY 2017-18	
FY 2018-19	
FY 2019-20	
Total	

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:

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

Format – G

LIST OF PROJECTS

(Grid connected / off grid Solar P V Power Generation Plants)

Sr. No.	Name of Beneficiary and address with E-mail Id and Contact No. (Landline & Mobile No.)	Plant Capacity (KWp)	Date for commissioning / Current Status of Project (Attach certificate by user Agency)	RMS ID	Password

For
(Company Name)

Name of signing authority / Designation / Place / Date

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

Format – H

SITE VISIT REPORT

(To be submitted on letter head of bidder) Date:

To,

Divisional General Manager,
Maharashtra Energy Development Agency, (Divisional Office Mumbai)
1012-A, 10th Floor, Embassy Centre, Nariman Point Mumbai, Maharashtra
400021, Phone No: 022 – 22876436,
E-mail ID: - dgmmumbai@mahaurja.com

Reference: E-tender no. **MEDA-DIVMU/JJ/2020-21**

Sub.: Site Visit Report for design, manufacture, supply, installation, testing and commissioning with five years comprehensive maintenance contract of 160 kWp On grid at JJ Hospital

Respected Sir/Madam,

This has reference to above referred tender of electrification of

a) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra C.J Building - 20KW (2 x 10KWp)
b) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Skin Building, Ward 43 -20KWp (2 x 10KWp)
c) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Balaram Building-40KWp
d) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra Main Building- 30KWp
e) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra OPD Building- 30KWp
f) JJ Hospital Road, Noor Baug, Nagpada, Mumbai Central, Mumbai, Maharashtra PWD Building- 20KWp to be electrified through Solar Power. I / We hereby declare that we have visited the 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, Seal:

(Signature of Bidder)
Name of bidder's representative visited the site: …….
Designation: …….

Format - I

DETAILS OF OFFERED SYSTEM

Sr. No.	Particulars	Capacity
		Quantity
		Make
1.	Module Mounting Structure	
2.	Solar PV modules	
3.	PCU	
4.	Array Junction Box	
5.	DC Cables	
6.	Distribution Boards / Panels	
7.	AC Cables	
8.	Lightening Arrestor	
9.	Earthing Equipments	
10.	Fire Detection & Protection System / Fire Extinguishers	
11.	Tools & Tackles required for installation, testing, operation & maintenance of entire 40 kWp SPV Systems	

*<u>Note:</u> 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.*

Format – J

DATA FOR ASSURED POWER GENERATION

Sr. No.	Power Generation During #	On-grid
1.	Min. total peak hour	
2.	Min. total for 1st year	
3.	Min. total for 2 nd year	
4.	Min. total for 3 rd year	
5.	Min. total for 4 th year	
6.	Min. total for 5th year	
7.	Min. total for 10 th year	
8.	Min. total for 15 th year	
9.	Min. total for 20 th year	
10.	Min. total for 25th year	

Note:"#" Energy generation /Power production in (AC) units at application end by offered SPV system; considering ideal conditions / climatic conditions for proposed location; as per reference Data available by various reputed International / GoI institutes.

Format: Commitment from the Bidder

(To be submitted separately)

We here by confirm that from propose plant system, Grid connected solar PV Plant at different Government Buildings at Mumbai, we will provide the assured generation of----------units per month at energy meter in control cabin/room as certified by joint meter reading of manufacturer's representative and user's representative.

However for 5 years we hereby commit to pay an amount of **Rs. 6**/- per unit as compensation to MEDA Mumbai, Dist. Mumbai for the amount of units unable to supply against the guaranteed generation.

Date:

Place: **Signature of the Tenderer**

Seal

Checklist:

Sr. No.	Particulars	Page No.
1	Copy of receipt of tender fee	
2	Copy of receipt for EMD	
3	Duly stamped and signed Tender Document (E-Sign is permitted)	
4	Industry /Firm/Company registration certificate (MSME allowed).	
5	Copy of PAN Card	
6	Copy of GST registration	
7	Power of attorney; for company's authorized person (Refer Format – A)	
8	Self-Certification of No Barr/non failure/blacklisted (Refer Format – B)	
9	Bank details of bidder (Refer Format - C)	
10	Bidder's Information Sheet (Refer Format - D)	
11	Details of set-up for after sales service (Refer Format - E)	
12	Financial credentials of bidder (Refer Format - F), along with: 4. Scanned copy of IT returns for last three financial years, supporting with 5. Summary of balance sheet / auditor's report. Only profit making organizations are eligible. 6. Overall Average Annual Turnover of the Company/Firm/ Corporation in the last three financial years should be at least **Rs.1 Crore** (Rupees One Crores 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)	
13	Experience for installation and commissioning of SPV power plants / list of projects (Refer Format - G). Along with : d) Scanned copies of work / purchase orders received for completed projects and performance reports from beneficiary along with RMS Details. Incomplete Work Orders/ Purchase orders will not be accepted. e) Shall have experience for installation of cumulative capacity 4**0kWp** in which at least one project shall be of **20kWp** capacity On-grid SPV system; installed, commissioned & working successfully for at least one year. [Demonstration for such installations shall be allowed during pre-bid meeting (individual time slot will not be allowed for more than 10 Minutes). f) 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.]	
14	Site visit report (Refer Format – H) **Note: Individual report should be submitted for all the mentioned sites.**	
15	Details of proposed / offered system (Refer Format - I) **Note: Individual report should be submitted for all the mentioned sites.**	
16	Details for output / power generation – assumed & assured from proposed / offered system (Refer Format - J). **Note: Individual report should be submitted for all the mentioned sites.**	
17	Brochure for offered solar systems along with test certificates compiling applicable Standards as per guidelines issued by MNRE. And details of Guaranties & Warranties.	
18	Manufacture/supply the material (module & inverter) only as per standards mention in tender document (Annexure – A). **Should provide valid IEC certificate of SPV Module & Inverter and test report from authorized test center of MNRE, GoI.**	
19	Format of Commitment from the Bidder	

Note:

- Above information / documents are to be uploaded / annexed and flagged 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 100 dpi.
- Submit financial BID, separately.

1	**PART-B**	Separate duly filled soft copy of Excel file for financialbid shall be uploaded