TENDER CA LL NOTICE NO.

23/JM/ ELECT /OSPHWC/2019-20

BID DOCUMENT
FOR

DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND COMPREHENSIVE MAINTENANCE CONTRACT FOR A PERIOD OF 05 (FIVE) YEARS OF GRID CONNECTED ROOF TOP SOLAR POWER SYSTEMS (THROUGH NET METERING)

NAME OF THE WORK

DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND COMPREHENSIVE MAINTENANCE CONTRACT FOR A PERIOD OF 05 (FIVE) YEARS OF 10 KWP GRID CONNECTED ROOF TOP SOLAR POWER SYSTEMS (THROUGH NET METERING)

AT

CYBER POLICE STATION BUILDING, BHUBANESWAR

JOINT MANAGER

[ELECTRICAL DIVISION]

The Odisha State Police Housing & Welfare Corporation Ltd., Janpath,

Bhoi Nagar, Bhubaneswar - 22.

THE ODISHA STATE POLICE HOUSING & WELFARE CORPORATION LTD.
JANAPATH, BHOINAGAR, BHUBANESWAR – 22.
[Electrical Division]
Ph: 0674-2541545, 2542921, Fax: 0674-2541543
E-mail: jmelectricalophwc@gmail.com, Website: www.ophwc.nic.in

SHORT TENDER CALL NOTICE
BID REFERENCE NO: -23 /JM / ELECT / OPHWC/ 2019-20

INVITATION FOR BIDS (IFB)

1.	The **Joint Manager, Electrical Division** (OSPH&WC), Odisha, Bhubaneswar invites **percentage rate** bids in **single cover** system for works as detailed below:-		
2.	Nature of work	**:**	Design, Supply, Installation, Testing, Commissioning and Comprehensive Maintenance Contract for a period of 05 (five) years of 10 KWp Grid connected Roof Top Solar Power Systems (through Net Metering) at Cyber Police Station Building, Bhubaneswar.
3.	No. of Work	**:**	**01 No.**
4.	Value of Tender	**:**	**Rs. 5,00,000.00**
5.	EMD & Bid Cost	**:**	(As per column 4 & 5of the IFB)
6.	**Eligibility Criteria: -**	**:**	**Firms enlisted under OSPH&WC for Installation of On-Grid Solar System (Group-B)** **.**
7.	Availability of Bid Documents in the Website **www.ophwc.nic.in**	**:**	**Dt.01.11.2019 to Dt.06.11.2019 up to 5:00 P.M.**
8.	Last date /time of Receipt of Bids	**:**	**Dt.07.11.2019 up to 12:30 P.M**
9.	Date of Opening Bid	**:**	**Dt. 07.11.2019 at 03:30 P.M.**
10.	Further details can be seen from the website: **www.ophwc.nic.in** Any addendum/corrigendum/cancellation of tender can also be seen in the said website.		

Sd/-
Joint Manager (Elect)
OSPH&WC, Bhubaneswar.

BID DOCUMENTS

THE ODISHA STATE POLICE HOUSING & WELFARE CORPORATION LTD.
JANAPATH, BHOINAGAR, BHUBANESWAR – 22.
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Ph: 0674-2541545, 2542921, Fax: 0674-2541543
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SHORT TENDER CALL NOTICE
BID REFERENCE NO :- 23/JM/ ELECT /OPHWC/2019-20
INVITATION FOR BIDS (IFB)

1. The Joint Manager, Electrical Division, The Odisha State Police Housing & Welfare Corporation Ltd., Bhubaneswar invites percentage rate bids in single cover system for Design, Supply, Installation, Testing, Commissioning and Comprehensive Maintenance Contract for a period of 05 (five) years of 10 KWp. Grid connected Roof Top Solar Power Systems (through Net Metering) at Cyber Police Station Building, Bhubaneswar as detailed in the table from the firms enlisted under OSPH&WC for installation of On-Grid Solar system (Group-B). Every bidder is expected to inspect the site of proposed work before quoting their rates.

2. The bidders may submit bid for the following work.

Sl. No	Name of the work	Approximate Estimated Cost (Rs.)	EMD/Bid Security (Rs.)	Cost of Bid document Inclusive of 18% towards GST (Rs.)	Period of completion	Eligibility Group
1	2	3	4	5	6	7
Single Cover (NOTICE NO :- 23/ JM/ ELECT / OPHWC/ 2019-20)						
1.	Design, Supply, Installation, Testing, Commissioning and Comprehensive Maintenance Contract for a period of 05 (five) years of 10 KWp. Grid connected Roof Top Solar Power Systems (through Net Metering) at Cyber Police Station Building, Bhubaneswar.	**5,00,000.00**	**5,000.00**	**4720.00**	**21 days**	**Group-B**

N.B. - The quoted rate should be all inclusive and inclusive of G.S.T.

Requirements under Goods & Service Tax Act.

The supplier of goods or service or both shall submit the tax invoice for release of payment and the tax invoice should include all the particulars and contents as required under section-31 of the CGST/SGST/IGST/UTST Act, 2017 read with rules made there under, including the followings:

a. **Correct Name, Address & GST No. of both the Supplier and recipient.**
b. **"Tax Invoice" should be clearly mentioned on the invoice copy.**
c. **GST should be clearly mentioned separately.**
d. **Correct classification of supply of goods, services or both should be made.**

e. **Nature of supply whether it is interstate or intra state should be mentioned.**
f. **Place of supply should be mentioned.**
g. **Prevailing rate of tax should be clearly mentioned.**
h. **Levy of Tax whether as forward charge or reverse charge should be mentioned.**
i. **The supplier shall submit a original copy of Tax Invoice to the Corporation (OSPH&WC).**

A. **The supplier shall declare that the tax so collected from the Corporation will be duly discharged either by using input tax credit or paid as per provisions under GST Act.**

B. **The supplier shall declare that the supply date as mentioned in the invoice will be disclosed correctly in the relevant monthly return (such as GSTR-1, GSTR-2, GSTR-3, GSTR-3B and other relevant forms).**

C. **The supplier shall also agree that he will compensate for input tax credit if not allowed to Corporation due to non-disclosure or improper disclosure in the aforesaid returns as required under GST Act.**

D. **If the supplier is unregistered under GST Act., in that case the supplier should submit an undertaking that his turnover is within the threshold limit.**

E. **Anti-profiteering clause. : The supplier should declare that the benefit on account of change of rate of GST and input tax credit will be passed on to Corporation by way of reducing the contact prices and there shall not be any double taxation.**

F. **As and when GST Law requires deduction of withholding tax i.e., TDS under section**

G. **Supplier of goods shall issue way bill as and when required as per provisions of GST law for supply of goods.**

3.Bid documents consisting of specifications, the schedule of quantities and the set of terms and conditions of contract and other necessary documents can be seen in the website: **www.ophwc.nic.in**

4.The authority will not be held responsible for any technical snag or network failure during downloading the tender documents.

5.The tender document may be obtained on payment of the tender paper cost as mentioned in the **Column - 5** of the above table [Non refundable] for each project between **10.00 A.M. to 05.00 P.M** on each working day from the office of the undersigned at the address given above of O.S.P.H.&WC at Bhubaneswar on or before **Dt.06/11/2019** .Tender document can also be obtained through speed post by sending a self addressed envelope of size 35 cm x 25 cm along with a Demand Draft / Pay Order of the tender paper cost as mentioned in the **Column - 5** of the above table and **Rs. 200.00** (Rupees two hundred only) extra for postal charges [Non refundable] for each project on any Nationalised Bank, payable at Bhubaneswar, drawn in favour of the **"The Odisha State Police Housing &Welfare Corporation Ltd, Bhubaneswar.".** However, such request must be received by the undersigned on or before the last date for issue of tender document. The O.S.P.H.&W.C. authorities shall not be responsible for postal or other delays. The tender document will also be available from the web site ***www.ophwc.nic.in*** and the same can be downloaded to be used for tender offer. However in case of downloaded tender documents an amount of the tender paper cost as mentioned in the **Column – 5** of the above table [Non refundable] for each project in shape of Demand Draft / Pay Order drawn on any Nationalised

Bank, is payable at Bhubaneswar in, favour of the **"The Odisha State Police Housing &Welfare Corporation Ltd, Bhubaneswar."** should submit along with the tender, failing which tender shall be liable for rejection. The tenders/bids can be sent by post or courier or dropped in the **tender Box at the office of the undersigned as well**. However, authorities shall not be responsible for postal delays in receipt of bids.

6. The bidders are requested to submit the purchase receipt of showing cost of the tender paper/D.D (Original) in case of down loaded tender document, attested copies of valid **H.T./M.V** electrical license **issued** by State Electrical Licensing Board, Odisha **(ELBO) /** JV with firms possessing such license, Income tax return copy, PAN, GST Registration certificate, EPF Registration certificate, ESI Registration certificate along with bid documents otherwise the bid shall be liable for rejection. The latest authenticated documentary proof shall be submitted. The proof submitted earlier in some other contest shall not be treated as valid and sufficient.

7. EMD - The tender document shall be accompanied with EMD as mentioned in the Column**- 4** of the above table in shape of D.D. / Pay order drawn on any Nationalized Bank in favor of the **"The Odisha State Police Housing &Welfare corporation Ltd, Bhubaneswar."** payable at Bhubaneswar failing which the tender shall be rejected. The **EMD** of the successful tenderer will be refunded after completion of the Comprehensive Maintenance Contract period of 05 (five) years and will not carry any interest. The **EMD** of the unsuccessful tenderer will be refunded after completion of the tender process.

8. (<u>Ammendment to Para 3.5.5(v)Note-ii of OPWD Code Vol-I by modification)</u>

Note-(II) Additional performance Security shall be obtained from the bidder when the bid amount is less than the estimated cost put to tender .In such an event, the bidders who have quoted less bid price/rates than the estimated cost put to tender shall have to furnish the exact amount of differential cost i.e. estimated cost put to tender minus the work order amount as Additional performance Security in shape of Demand Draft / Term Deposit Receipt pledged in favour of **"The Odisha State Police Housing &Welfare corporation Ltd, Bhubaneswar." payable at Bhubaneswar is to be submitted** by the successful bidder who shall deposit the same within seven(7) days of opening of bid failing which the bid of the successful bidder would be cancelled and the security deposit would be forfeited. If permissible in law further proceedings for black listing would be initiated.

9. Other details can be seen in the tender documents.

10. Bids submitted otherwise than in the manner prescribed in the tender document shall be rejected.

11. The bidding document should be super scribed **"Design, Supply, Installation, Testing & Commissioning of On-Grid Solar PV System , Work serial No. as per IFB, Tender No. & Name of the Project".**

12. The tender document is available from**: Dt.01.11.2019**

13. Last date for issue of tender document is up to**: 05.00 PM of Dt.06.11.2019**

14. Last date for receipt of tender document is up to**: 12.30 PM of Dt. 07.11.2019**

15. Date of opening of bid at**: 03.30 PM of Dt.07.11.2019**

16. The authority reserves the right to reject any or all the bids without assigning any reason thereof.

17. An affidavit is to be furnished by the bidder at the time of submitting bid document that he is not blacklisted / defaulter contractor or Firm etc. in support of the tender otherwise the bid shall be liable for rejection. The authority reserves the right to reject any or all the bids without assigning any reason thereof and can impose any conditions as deemed proper before finalisation of tender.

18. All the information as called for in the tender document should be submitted truly, clearly, legible, transparently, unambiguously and without the use of abbreviations. It shall be submitted in English only.

19. All the crucial figures, like rates and amount should be written in figures followed by words in a bracket.

20. There shall be no over writing in the tender document and other papers submitted. All additions, alternations, deletions and cutting should be initialed with rubber-stamp (or seal) by the same person, who signs the tender document, failing which so, the tender may be rejected.

21. The original documents of the successful lowest bidders will be verified at the office of the undersigned within five (5) working days of opening of the bid failing which his tender is liable for rejection.

22. All the rates and amounts shall be quoted in Indian Rupee and shall be presumed to be in Indian Rupee only unless specifically permitted to be quoted otherwise in this tender document.

23. Each page of this tender document should be signed by the bidder with seal in token of having read, understood and accepted the terms and conditions of this contract.

24. Use separate piece of paper where the space provided in the formats in this tender document for submission of information is not sufficient.

25. All information submitted or supplied in the formats of this tender document shall be presumed to be true to the best of knowledge of bidder.

26. If the last date for receipt of the tender/bid turns out to be a holiday, it will automatically be extended to next working day.

27.A bid submitted can not be withdrawn. The bidder or his authorized representative (one person only) will be allowed to be present at the time of opening of tenders. They will not participate in the discussions. Clarification sought, if any may be provided by them.

28. All or any of the tenders /bids submitted can be rejected without assigning any reason thereof. No claim, whatsoever, shall be admissible for the alleged loss/damages suffered by bidders on account of such rejections.

29. If the bidder has a relative employed as an Officer in the rank of Deputy Manager & above in OSPHWC, Bhubaneswar, he shall inform the same in the bid mentioning the exact details in a covering letter along with the tender, failing which his bid will not be considered. Also if the fact of relationship subsequently comes to light, his contract will be rescinded. The bid security or the performance security will be forfeited and he shall be liable to make good any loss or damage resulting from such cancellation. In case the bidder has no relationship with any of the officers mentioned above he shall have to furnish with his bid a certificate.

30. Advance payment /part payment will not be entertained before completion and handing over the work to the user authority.

31. Deduction towards Labour Cess @ 1% shall be made from the gross amount of the contractor‘s claim/bill.

32. No claim can be made due to some unforeseen delay for release of payment.

33. Deduction towards Security money @ 5 % shall be made from the gross amount of the contractor's claim/bill and same will be released after successful completion of **05 years** of Comprehensive Maintenance Contract period.

34. If the contractor fails to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the OSPH&WC on account of such breach, pay as agreed compensation @ 0.5% per day for delay of work, delay to be counted as per day basis. Provided that the total amount of compensation for delay to be paid under this condition shall not exceed 5 % of the work order Value.

35. Request for reschedule and extension of time, to be eligible for consideration, shall be made by the Contractor in writing well before of the happening of the event causing delay with specific reason in form No - 10 of the OAM (OSPH&WC). The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

36. In any such case a fair and reasonable extension of time for completion of work may be given. Such extension shall be communicated to the contractor by the tender calling authority in writing within due time.

37. All the transit risk shall be responsibility of the contractor.

38. Failure to complete the work in full within the stipulated period may lead to forfeiture of EMD and blacklisting of the contractor/firm.

39. The authorities are not bound to accept the lowest quoted rate.

40. Terms and conditions of this tender document cannot be negotiated for variations.

41. The authority reserves the right to reject any or all tender in whole or part without assigning any reason and can impose any other condition(s) as deemed proper before or in course of finalisation of the tender.

42. The approved tender may be cancelled by the authority any time during validity without assigning any reason thereof and no claim can lie against OSPHW&C for such cancellation.

43. Before take up the work the A.P.M (Electrical) concerned shall verify/ certify the quality of materials.

Sd/-
Joint Manager (Elect)

SCOPE OF WORKS

The broad scope of the work includes Design, Supply, Installation, Commissioning and Comprehensive Maintenance Contract for a period of 5 years of 10 KWp. Grid Connected Roof Top Solar power systems (Through Net Metering) at Cyber Police Station Building, Bhubaneswar.

DESIGN

a. The bidder is required to design the complete system as per requirement of the OPHWC as well as connectivity needs using the solar PV modules/PCUs and BOS. Any change or modification, if needed, may be made with prior approval of OPHWC.

b. The connectivity of all the systems must be as per Latest Order of OERC on Net Metering vide No. OERC-Engg. 02/2010/(Vol-IV)/1131 Dated :19.08.2016 as amended up to 17.01.2018 (refer Annexure K).

c. Remote communication facility must be provided in the Generation Meter & Net Meter to monitor Generation/Export Data. The login credentials must be shared with user Agency / OPHWC.

d. The Module Mounting Structure must be designed to be completely Non-Invasive (without any grouting/chipping) on the roof. (An indicative design is given at Page 15- Technical Specifications of MMS)

SUPPLY

a. Supply of complete systems, including all necessary components, sub-components, spares, tools, tackles etc. as per BOQ and technical specifications given in this tender document.
b. Supply should also include packing, forwarding, safe storage and handling of all plants and equipments including insurance coverage- all FOR Customer.

PRE- INSTALLATION OBLIGATIONS

a. All structural drawings duly certified by a chartered engineer for their strength, stability and capability to withstand wind velocities up to 200KM/hr must be submitted before proceeding for installation.
b. Single Line Diagrams for all power plants indicating all wiring details, connectivity details etc. must be submitted.
c. Brochure, literature etc. if any
d. All Test certificates from MNRE/NABL approved laboratories as prescribed.
e. Technical Specifications of all materials to be supplied.
f. Consumer should Apply for Net Metering at respective Distribution Utility to obtain the Approval/Permission for Net metering. The successful bidder should facilitate the User Agency for obtaining NOC for Net Metering and getting the project connected to utility end through Net meter. **The Application Fees, Cost of Net Meter, Meter Testing Charges etc. shall be borne by the successful bidder.**
g. Before submission of the Bid, Bidders in their own interest should visit the sites. Refer Annexure J for Contact person name & contact No.

INSTALLATION

a. Installation of all plants and equipments has to be done as per the design criteria and SLDs.
b. There should not be any invasion/damage what so ever to the roof top due to setting up of the mounting structure of the solar power plant so that on a later day there is any leakage of rain water, etc. from the roof top.
c. While cabling the array care must be taken such that no loose cables lie on the rooftops. The roof top should look clean and tidy after installation of the array.
d. Display boards, danger boards etc. as mentioned in the tender should be prominently fixed in appropriate locations.
e. As far as possible PCUs & Control Panels should be wall mounted.
f. Care should be taken such that earthing flats do not touch the roof/walls at any place. Sufficient insulators should be provided for the same.
g. Providing Remote Monitoring Systems in each of the inverters of the solar PV power plants and sharing the RMS protocol as well as log- in ID and pass word of each system with the designated person from the User Agency as well as OPHWC.
h. Providing necessary protection devices to protect the power plant from lightening, sudden surges in voltage and current and to ensure safety of the grid to which the plant is connected.
i. The Bidder should ensure installation of Net Meter in coordination with Division/Sub Divisional offices of respective Distribution Utility.
j. The bidder should also ensure protection of life and property likely to be endangered due to the installed solar power plant.

COMMISIONING & TESTING:

a. After completion of installation work the plants have to be tested and commissioned in presence of the concerned APM (Electrical) & D.M.(I/C) (Electrical), OPHWC as well as the designated representative of the user Agency.
b. The date & time for testing and commissioning must be decided in consultation with the Joint Manager (Electrical), OPHWC. On the date of such testing & commissioning the commissioning certificate has to be taken into account.
c. The issuance of a JCC shall, in no way relieve the executing firm of it's responsibility for satisfactory operation of the power plant.
d. The testing and synchronization of Net Meter shall be ensured by the Bidder in coordination with MRT & Divisional office of respective Distribution Utility before Commissioning of the system. Net-meter if supplied by the Bidder, must be tested & approved by respective Distribution Utility.
e. The process of documentation of installation details & loading of pictures has to be done through Resolve App in consultation with the Joint Manager (Electrical), OPHWC.

MAINTENANCE

a. To ensure proper maintenance of the installed systems the bidder is required to appoint a technically qualified person at the site to look after day-to-day maintenance and upkeep of the plant. Sufficient Spare should also be kept with the service personnel so as to attend to any breakdown forthwith.

b. The bidder must enter in to a Comprehensive Maintenance Contract for a period of 5 years as per the format given in **Annexure A**.
c. The date of commencement of CMC shall be reckoned from the date of commissioning of the system in presence of the concerned APM (Electrical) & D.M.(I/C) (Electrical), OPHWC as well as the designated representative of the user Agency.

d. The bidder is required to submit the monthly generation reports of each power plant as per **Annexure B**.
e. The bidder is also required to undertake maintenance as and when required upon receipt of service request from user Agency.
f. The bidder must adhere to maintenance procedure by OPHWC from time to time.
g. The bidder is required to train at least two designated persons from the user Agency for day to day operation, maintenance and upkeep of the system.
h. The bidder if required should agree to undertake extended maintenance services beyond 5 years on mutually agreed terms and conditions.
i. The Maintenance guidelines & Corrective Maintenance procedure must be strictly adhered to. Scheduled maintenance must be complied every quarter through Mobile App as per the protocol at **Annexure C.**

SECURITY DEPOSIT/ PERFORMANCE GUARANTEE FEES: (Annexure D)

The successful bidders must deposit five numbers of bank guarantees (BG) each of value equal to 2 % of ordered value towards Security cum Performance Guarantee fees with the Joint Manager, Electrical Division, OPHWC, Bhubaneswar along with bills, challans and all other documents as per payment clause before processing of payment. The BGs will remain valid for 1, 2, 3, 4 and 5 years respectively from the date of installation of the systems.

FORFEITURE OF SECURITY DEPOSIT/PERFORMANCE BANK GUARANTEE

The said deposit would be forfeited in the following cases.

a. If the systems are not installed and commissioned as per given schedules.
b. If the systems are not properly maintained and the performance of the systems do not meet the standards mentioned in the work orders.

ISSUE OF LETTER OF INTENT (LOI)

i. Allocation of work will be done through specific work orders issued in the name of the select bidders.
ii. Prior to issue of work orders a Letter of Intent will be issued to the selected bidders detailing out the quantity and scope of the works, locations of works, Bank Guarantees and documents to be submitted before issue of work orders, other deliverables, etc.
iii. Upon receiving the same the bidder is required to visit the project sites , discuss details of the project with the concerned user agency, finalize the exact sites of installation, loads to be separated for connecting to the solar power plants, convenient dates of installation etc. as well as all logistics details. Following this the bidder has to submit a letter of acceptance of the LoI along with the required bank guarantees, work execution schedule, required documents, etc. and after verification of the same work order will be issued.

WARRANTY:

a. The complete system should be warranted against any manufacturing defect or bad workmanship at least for a period of 5 (five) years from the date of commissioning of the systems.
b. Major system sub-component SPV modules must be warranted against any manufacturing defect of bad workmanship for a period of 5 years.
c. Warranty certificate to the above effect must be furnished along with the commissioning reports. Any defect noticed during warranty period should be rectified /replaced by the supplier free of cost upon due intimation by user agency.

FORCE MAJEURE:

The supplier of the SPV system shall not be charged with liquidated damages nor shall his security for performance be forfeited when failure of the supplier in making delivery is due to any event beyond the control of the supplier and could not have been foreseen, prevented or avoided by a prudent person. These include, but are not restricted to acts of nature, acts of public enemy, acts of Government, fires, floods, epidemics, strikes, freights, embargoes and unusually severe weather.

INSPECTION:

i. All tests and inspections shall be made at the place of delivery. Officers authorized by OPHWC shall be entitled at all reasonable time to inspect and supervise and test during erection and commissioning. Such inspection will not relieve the executing firm of their obligation in the contract.
ii. OPHWC shall have the right to have the tests carried out at its own cost by an independent agency at any point of time.

PAYMENT:

a. **90 %** of the cost of system and installation charge along with all applicable tax shall be released upon commissioning of the systems with or without Net Meter at the location specified in the purchase order upon due verification by authorised officers and submission of following documents:

Performance report signed by the OPHWC/User Authority
Project completion report & JCC
Warranty
Web enabled generation report
Operation manual
Conducting training programme
Login Credentials of Generation Meter, Net Meter & PCU
GPS based photograph
I-V Curves
Dos &Don'ts in the form of a booklet
Photographs of all installations in the specified manner
Critical Documents (Annexure I)
GPS based photograph

b. Balance 10% cost of the supplied materials, Installation & Commissioning charges will be released after installation, testing, charging of Net Meter and hand over of the work to the User Authority.

EXECUTION:

Execution of work shall be carried out in an approved manner as outlined in the technical specification or where not outlined, in accordance with relevant Indian Standard Specification, to the reasonable satisfaction of the Authorized OPHWC Officer. The general schedule of execution will be as follows:

a. Under normal circumstances all ordered systems must be installed and commissioned in all respects within **21**days of receipt of firm work order from OPHWC.
b. Under exceptional circumstances the OPHWC may consider to extend the execution period by a maximum of **10** days upon written application of the vendor stating justified reasons for delay which should be supported by the User Authority and recommended by the concerned officer of OPHWC.
c. Upon intimation about commissioning of the systems by the executing firm a joint inspection will be carried out by the representatives of the executing firm, OPHWC and User Agency.
d. The issuance of a JCC shall, in no way relieve the executing firm of it's responsibility for satisfactory operation of the power plant.
e. The bidder must securitize the execution schedule by providing bank guarantee equal to 10% of the ordered value from any nationalized bank with validity of 100 days from the date of issue of the work order. In case of delay beyond the approved period the bank guarantee will be encashed and retained by OPHWC. Additional penalty may be imposed / order may be terminated as per provisions in the tender.

CMC & BG FOR PERFORMANCE GUARANTEE

i. Comprehensive Maintenance Contract (Annexure A)

Upon selection, the bidder must enter into a Comprehensive Maintenance Contract with User Agency for a period of 5 years from the date of commissioning of each project in the format given at Annexure A. Willingness to execute such CMC will have to be submitted along with the tender.

* The broad scope of CMC shall cover

a. Routine visit to project site at least once in 3 months.
b. Attend maintenance calls given by User Agency / escalated by OPHWC within maximum 3 days of receipt of the intimation.
c. The scope of CMC must cover supply of spare parts (including wherever necessary)/ services during the contract in force. Order shall be placed on bidders who agree to offer such CMC.
d. Repair/Replace defective/malfunctioning spares/components within warranty period.
e. Provide monthly kWh meter reading to User Agency.

ii. BG for Performance Guarantee (Annexure D)

At the time of execution of maintenance contract the bidder shall deposit five numbers of bank guarantees (BG) each of value equal to 2 % of ordered value towards maintenance Performance Guarantee fees with the Joint Manager, Electrical Division, OPHWC, Bhubaneswar having validity of 1, 2, 3, 4 and 5 years respectively from the date of commissioning of the systems.

a. The Performance Bank Guarantees will be returned after completion of 1st, 2nd, 3rd, 4th and 5th year of successful maintenance subject to receipt of satisfactory report from the User Authority.

Note:

Execution of CMC and submission of Performance Bank Guarantees (Format at Annexure A & D) are pre conditions for release of 1st payment of 90%.

LIMITATION OF LIABILITY:

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

DISPUTE:

For adjudication of any dispute between OPHWC and the bidders arising in this case, reference can be made to any Law courts under the jurisdiction of Odisha High court only.

Sd/-

SIGNATURE OF BIDDER WITH SEAL **Joint Manager (Elect)**

TECHNICAL SPECIFICATION FOR GRID CONNECTED ROOF TOP SOLAR POWER PLANT

The general scope under this contract includes design, testing, inspection, packing and forwarding, transportation up to project site, loading & unloading, storage in safe custody, erection, carrying out preliminary tests at site, commissioning, performance testing, operation and maintenance for 5 years & handing over to all the equipment of SPV Power plant on the respective sites / as per instruction from time to time. The illustrative Schedule of requirements is in accordance with the specifications contained in this document

1. SOLAR PHOTOVOLTAIC MODULES:

a. The PV modules to be used should be made in India.

b. The PV modules should qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards Crystalline Silicon Solar Cell Modules IEC 61215/IS14286. In addition, the modules shall conform to IEC 61730 Part-2- requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS. The module should also confirm to IEC 61701 (Salt Mist Corrosion Testing)

c. The total solar PV array capacity should not be less than the required capacity and should comprise of solar crystalline modules of minimum **300** Wp and above wattage **with 72 cells.** String Voltage should not be more than 600 V DC.

d. Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.

e. PV modules will be tested and approved by one of the MNRE/IEC authorized test centers.

f. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.

g. Other general specification for the PV modules and subsystems shall be the Following as

   i. The rated output power of any supplied module shall have tolerance of +/-3%.

   ii. 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 by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

   iii. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-21/20 rated.

   iv. I-V & P-V curves at STC will be provided after installation.

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

h. Modules should have a RF identification tag. The following information will be

mentioned in the RFID used on each modules (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).

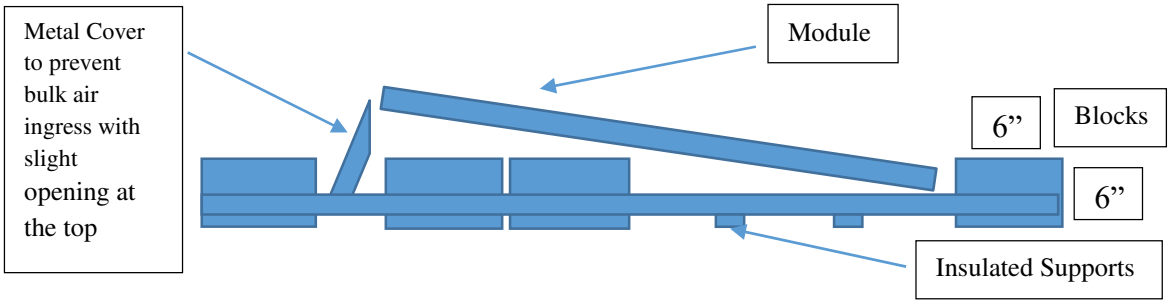
i. Name of the manufacturer of the PV module
ii. Name of the manufacturer of Solar Cells.
iii. Month & year of the manufacture (separate for solar cells and modules)
iv. Country of origin (separately for solar cells and module)
v. I-V curve for the module Wattage, Im, Vm and FF for the module
vi. Unique Serial No and Model No of the module
vii. Date and year of obtaining IEC PV module qualification certificate.
viii. Name of the test lab issuing IEC certificate.
ix. Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001.

2. ARRAY/MODULE MOUNTING STRUCTURE:

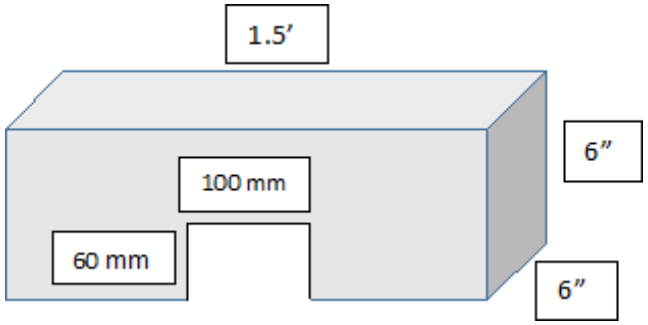
i. Hot dip galvanized MS/Aluminum mounting structures shall be used for mounting the modules/ panels/arrays. Each structure will have angle of inclination as per the site conditions to take maximum insolation.

ii. The Mounting structure must be Non-invasive and any sort of penetration of roof to be avoided. The design details are as follows:

a. The inclination of module should not be more than 24 degrees.
b. Each module should be loaded with 8 Non-Invasive blocks with 4 on each side. (2 blocks below the module & 2 blocks at both ends)
c. The upper edge of the module must be covered with metal sheet so as to avoid bulk air ingress below the module. Slight clearance must be provided on both edges (upper & lower) to allow air for cooling.



d. Each block should be of 25 Kg weight & should be cubical shaped reinforced concrete with dimensions of 1.5 feet (length)*6 inch (breadth)*6 inch (height) with a cut-out of 100 mm*60 mm across the breadth to encompass the 100 mm base channels.



iii. The mounting structure should be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
iv. The fasteners 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.
v. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m^2. The load shall be well distributed so that point loads are well within the limits.
vi. The minimum clearance of the structure from the roof level should be 200 mm.
vii. The structures should be laid on the rooftop on weather resistant FRP mountings which should be non-penetrating type and proper drainage of rain water over terrace through the installation area should be maintained.
viii. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.
ix. Special care should be taken while designing all structures for modules to cater to heavy rainfall.
x. The array shall be located sufficiently inside the boundary wall of the terrace (parapet wall) and should not be projecting out. PV array shall be installed in the terrace space free from any obstruction and/or shadow. PV array shall be installed utilizing optimum terrace space to minimize effects of shadows due to adjacent PV panel rows.
xi. 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.
xii. Additional waterproofing shall be provided in the areas where RCC blocks are placed on the terrace.
xiii. The minimum clearance between lower edge of PV panel and terrace ground level shall be 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
xiv. The PV array structure design shall be appropriate with a factor of safety of min. 1.5.
xv. Each PV panel structure shall incorporate one bird repellent spike at a level higher than the panel upper edge. The location of the spike should be selected for minimum shadow effect.
xvi. The support structure shall be free from corrosion when installed.
xvii. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners/clamps shall be adequately treated to resist corrosion.
xviii. Adequate spacing shall be provided between any two modules secured on PV array for improved wind resistance.
xix. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
xx. The structure should be appropriately designed to withstand high wind velocities up to

180-200 km per hour. (The bidder is required to submit a certificate from an authorized chartered engineer with regards to the strength and durability of the structure)

3. **ARRAY/ MAIN JUNCTION BOXES (JBs):**

a) The J. Boxes (JBs) made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement shall be provided. All wires/cables shall be terminated through Copper cable lugs. The JBs shall be such that input & output termination can be made through suitable cable glands.

b) Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands.

c) Fuse protection should be provided for each string for +ve cables.

d) Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups.

e) Suitable markings should be provided on the bus bar for easy identification and suitable cable glands with ferrules must be fitted at the cable termination points for identification.

f) Array Junction Box should be IP 65(for outdoor)/ IP 54(for indoor) as per IEC 60529 and should be provided with fuses and Isolators of suitable ratings.

g) ACDB should have surge protection device of class 2 as per IEC 60947/60364-5-53, to protect inverters from surges in the AC line.

h) **AJBs/MJB may be kept below the modules. In case of need this can be installed on wall or rooftop.** ACDB should be put at safe distance from DCDB/AJBs/MJBs to avoid Eddy current interference.

4. **DC DISTRIBUTION BOARD:**

a) Dust & vermin proof Enclosures of Polycarbonate/GRP/FRP/Powder coated Aluminium/Cast Aluminium Alloy & should have IP 65(outdoor)/54(indoor) compliant to IEC 60529.

b) The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

c) Suitable cable entry points with cable glands and ferrules should be provided.

d) DC SPD of type 2 compliant to IEC 60497 with fuse should be provided.

e) Design ambient temperature should be 0-60 degC.

5. **AC DISTRIBUTION PANEL BOARD:**

a) AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary over current & surge protection.

b) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.

c) All the Panel's should be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz.

d) Suitable cable entry points with cable glands and ferrules should be provided.

e) DC SPD of type 2 compliant to IEC 60497 with fuse should be provided.
f) Design ambient temperature should be 0-60 degC.
g) The panels should be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
h) All indoor panels should have protection of IP20 or better. All outdoor panels will have protection of IP21 or better.
i) Should confirm to Indian Electricity Act & rules (till last amendment)
j) All the 415 V or 230 V devices/ equipment like bus support insulators, circuit breakers, SPDs, VTs, etc… mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions

Variation in Supply Voltage	+/- 10%
Variation in Supply frequency	+/- 3 Hz

6. GRID TIED POWER CONDITIONING UNIT/INVERTER:

i. As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels before powering equipment designed for nominal mains AC supply. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the "Power Conditioning Unit" OR simply PCU. PCU refers to combination of charge controller, inverter and AC charger and shall be supplied as integrated unit or separate units.

ii. The inverter should be highly efficient. The inverter should confirm IEC 61683, IEC 60068 & IEC 62116 (Anti Islanding Protection) i.e. it should island the Solar PV
System in case the Grid shuts down. It should be based on MPPT design. Beyond the maximum load the inverters should trip. The inverters should be designed to be completely compatible with the distribution panels and are of integrated design.

iii. Salient features of the Inverters shall be as follows:
a. The PCU should be designed to be completely compatible with the SPV array voltage.
b. Grid tied Inverter with inbuilt MPPT should be used.
c. The sine wave output of the inverter shall be 415 V, 3 phase, 50 HZ AC.
d. The peak inverter efficiency inclusive of built in isolation transformer shall exceed 85% at full load
e. Inverter shall provide display of PV array DC voltage & current, Inverter Voltage & Current, Grid voltage, Current and required parameters when fault occurs. Remote monitoring of inverter parameters must be facilitated.
f. Operating temperature Range shall be 0 to 55 deg C
g. Maximum Power Point Tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array.
h. The charge controller/ MPPT units should qualify to IEC standards.
i. It should be equipped with Online microprocessor based Data Acquisition Systems and Remote Monitoring facility for 365 days with data Recovery from remote location.

- **Detailed Specifications are:**

Total output power (AC)	To match solar PV plant capacity while achieving optimum system efficiency
Input DC voltage range DC input	As required for the solar grid inverter
Maximum power point Tracking (MPPT)	Inbuilt
Number of independent MPPT Inputs	1 or more
Output AC voltage	Three phase 415 (+12.5%,-20%)
Operating Frequency range	47.5 – 52.5 Hz
Nominal frequency	50 Hz
Power factor of the inverter	>0.98 at nominal power
Total harmonic distortion	Less than 3%
Built-in Protection	AC high / low voltage; AC high /low Frequency
Anti-islanding protection	As per VDE 0126-1-1 or IEC 60255.5 or IEC 62116 or equivalent standards
Operating ambient temperature range	-10 degC - +60 degC
Humidity	0 – 95% Rh
Inverter efficiency	>=95%
weighted efficiency	94%
Protection degree	IP 65 for outdoor mounting, IP 54 for indoor mounting
Communication interface RS 485 / RS 232 and RJ45 Safety compliance	IEC 62103, IEC 62109-1, IEC 62109-2 Galvanic Isolation
Cooling Convection Display type	LCD for data display. LCD / LED for status display
Display parameters to include	Output power (W), cumulative energy (Wh), DC voltage (V), DC current(A), AC voltage(V), AC frequency(Hz), AC current(A); cumulative hours of operation,
Compliance with standards and codes	IEC6163/ IS 61683, IEC 60068- 2 (1,2,14,30)

7. PROTECTION:

The SPV power plant should be provided with Lightening and over voltage protection, connected with proper earth pits. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.

a. Lightning

a. The lightning Conductors shall be made of 25 mm diameter 4000 mm long GI spike as per provisions of IS 2309-1969. Necessary concrete foundation for holding the lightning conductor in position should be made after giving due consideration to maximum wind speed and maintenance requirement at site in future. The lightning conductor should be earthed through 20 mm X 3 mm thick GI flat earth pits/earth bus with proper Insulation. Height of Lightening Conductors from Array Structure should be minimum 4metres.

b. Most areas of the State being prone to lightening, Type-II SPDs shall be included as a mandatory requirement.

c. Similarly Type I+II SPD should also be provided on the grid side in ACDB or PCU to protect the PCU from damage

b. Earthing

a. Earthing should confirm to IS 3043.
b. Earth Continuity wire/conductor should be 3-8 SWG. Thickness of Conductor should be more than half of the thickest wire used in Electric wiring. Total resistance of continuity conductor should be less than 1 ohms.
c. Earthing lead can be of GI/Copper Strip. For each Earth Electrode 2 Leads must be provided.
d. Earth Electrode can be of GI Pipe/Plate. Pipe Electrode should be of 40 mm dia, 4.75 m length (for rocky soil)/2.75 m (for ordinary soil). Plate Electrode should be of 60 cm*60 cm at a depth of 3 m. Thickness of Plate should be 3.18 mm (copper)/6.35 mm (GI). Moistened land should be preferred for Earthing.
d. Charcoal along with Salt and Lime mixture/ Bentonite in granular form mixed with water/ Marconite/ Chemical Earthing (Bentonite based/ Graphite based with Aluminium Silicates & Metal Powder) should be provided. The mixture should be inserted into the pipe or put around the plate. The Electrode system should be covered with cast iron cover plate with locking arrangement. (Marconite is recommended due to its Very Low resistivity)
e. No . of Earthing points to be used:
    1. One Earthing for all the Structural Conducting Parts
    2. One Earthing for Inverter with ACDB, Array JB & Main JB.
    3. One Earthing for Lightening Arrester.
f. Each array structure of the SPV yard will be grounded properly. The array structures and the lightning conductors are to be connected to earth through 25 mm X 5mm GI strip.
g. The inverters and all equipment inside the control room shall be connected to earth through 25 mm X 5mm tinned copper strip including supplying of material and soldering. Earth bus should be provided inside the control room with25 mm X 5mm tinned copper strip.
h. In compliance to Rule 61 of Indian Electricity Rules, 2004 (as amended up to date), all non-current carrying metal parts should be earthed with two separate and distinct earth continuity wires.

8. SURGE PROTECTION DEVICES (SPD):

a. Surge protection device should be provided on both the DC side and the AC side of the solar PV system. It should have protection voltage of 2.5 kV & Nominal Discharge current of 5 kA (8/20) μ sec.
b. The DC surge protection devices (SPDs) should be installed in the DC distribution box adjacent to the solar inverter.
c. The AC SPDs shall be installed in the AC distribution box adjacent to the solar inverter.
d. The SPD's earthing terminal should be connected to earth through the abovementioned dedicated earthing system.

9. CABLES & WIRINGS:

a. The Cable & Wires should comply to IEC60227 or IS694 & IEC60502 or IS1554 BSEL50618 (for DC cables for PV systems).
b. All copper flexible cables should comply to IS651 and make should be Polycab,

Havells or equivalent.

c. Colour code should be followed for over all wiring i.e, red for positive, black for negative, green for earth.

d. All cable should run in suitable PVC Conduits .No cable should be directly exposed to sunlight.

e. Cable Sizes should be as per the given Current and Voltage ratings.

10. DISPLAY BOARD:

Display board of size 3 ft x 3 ft that gives detailed circuit diagram of the system with its description should be provided.

11. REMOTE MONITORING SYSTEM:

For better appreciation, the Solar PV Power plant must be provided with remote monitoring system. In case of mobile network is not available, the same may be provided with data dumping system. These systems should work using GSM/GPRS data communication service (GSM/GPRS service shall be provided by the Vendor for 5 years including data charges) or SMS (Short Message Service).They must provide data on power generation every 15 minutes indicating all spikes, dips etc.

*Important features:

a. Cloud based Communication
b. Dashboard display either on PC, Laptop, Tab, smart phone
c. Internal communication protocols.

*Monthly Report has to be submitted to OPHWC/User Agency.

12. DRAWINGS & MANUALS:

Two copies of Engineering, electrical drawings and Installation and O&M manuals are to be supplied by the bidders. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization and distribution for street lighting system along with protection equipment. Approved ISI and reputed makes for equipment be used. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to OPHWC before progressing with the installation work.

13. NET METER: TECHNICAL PARTICULARS FOR 3 PHASE 4 WIRE LT STATIC TRI-VECTOR BIDIRECTIONAL ENERGY METER DLMS CATEGORY 'B',

S.N.	Particulars	Technical Specifications
1	Type & make	3 Phase 4 Wire
2	Standard Applicable	IS:14697(1999), DLMS IS: 15959 Category B / CBIP report – 88 (with latest amendment)
3	(i) Accuracy class	0.5s
	(ii) Rated voltage	230V (P-N)
	(iii) Rated current	Secondary 5A
	(iv) Rated frequency	50Hz

4	Starting current (Min) at which meter shall run & continue to run	0.2% of Ib
5	Communication port	Two communication port • One galvanically isolated optical port (1107). For Local Reading ▪ Additional RS 232 port (RJ 11 connector) for modem communication
6	Battery backup	Two Lithium battery inside the meter. One for RTC backup & other for mains off operation.
7	**Materials to be used**	
	(i) Base	Engineering Plastic.
	(ii) Terminal block	Engineering Plastic.
	(iii) Meter cover	Engineering Plastic with display window of UV stabilised polycarbonate.
	(iv) Terminal cover	Engineering Plastic.
	(v) Screw	electroplated Brass
	(v) Screw size	M - 4 ⌟ 6mm
9	Type of display	7 segment LCD
	(i) No. of Digits display	7 digit 7 segment LCD display (High resolution display for the energy will be provided, in which minimum four digit after decimal will be provided).
	(ii) Character size of display	10x5 mm
10	(i) Fixing of meter	3 Fixing holes (One at top & two at bottom terminal block)
	(ii) Sealing provision	At terminal cover, MD Button, Communication port, Meter Body
11	Event record on meter in tamper condition	Should be capable as per relevant standards.
12	Size of calibration LED and colour	3mm Red
13	Relative humidity	95% (some time approaches to saturation).
14	Ref. Temperature	27°C
15	Temperature range of operation	-5 to 55°C
16	Drift in accuracy of measurement with time	No appreciable drift in accuracy in measurement with time.
17	Fixing arrangement of name plate	Secured and indelibly marked name plate (rating plate) will be fixed to the meter under display window.
18	Approximate weight of meter	*1.6 Kg ⌟ 0.2 Kg.
19	Type of body	Projection type
20	Demand Integration Period	15min
21	MD Reset	Auto Reset at 24:00 hrs at the end of each billing cycle
22	Marking	The marking of the meters shall be IS 14697/1999 (Reaffirmed 2004) DLMS- Category B as per IS 15959
23	Apparent calculation	Lag + Lead
24	TOD timing (Both MD & Energy)	00 : 00 Hrs to 06 : 00 Hrs 06 : 00 Hrs to 24 : 00 Hrs There will be a provision of at least 8 TOD zones for Active & Apparent Energy & Demand
25	Non-volatile memory to record history	HISTORY TOD MD – 6 months All Energy – 6 months
26	Compliance	OERC Order on Net Metering (Aug 2016 as amended upto 17-01-2018)
27	Acceptance	Same type of meter tested at Standard Testing Laboratory, Bhubaneswar
		Same type of meter tested at CESU MRT Laboratory, Bhubaneswar
28	MODEM	GPS/GPRS suitable for above meter

	Capability	Remote Data reading (RMR)
	Facility	Sealing provision
	Status	Through LED
	Provision	SIM CARD slot
	Compliance	Class 10
	Power supply	240VAC, 50Hz
	SERVER	WEB
	Monitoring over Client PC	Check healthiness of Plant, Total & Plant wise generation – daily, weekly, monthly. Profile data, Comparison between plants, Generated and Consumed energy, Power factor, Maximum demand, Power on-off time and duration, Events, Auto email reports
29	Billing requirements :	Import, Export and Net Energies, Active, Reactive, Apparent, PF, Demand, Support of different tariff structure like Flat & TOD.
30	Analysis & Services	Customized dashboard, Plant load factor, ROI tracking, Tracking per day expected revenue v/s actual revenue, Loss, Best performing plants, Best day, Carbon footprint reduction, Time to payback, Promised capacity & delivered.
31	**LTCT**	
	Specification	200/5A, 4 nos Resin cast Ring type LTCT, Burden : 5VA Accuracy : 0.5,having ID :35mm & mounting clamp to fix in Box
	Box	Double Door SMC Box (size 810mm x 350mm x 230mm) to mount meter, CT & Modem

14. GENERATION METER- TECHNICAL PARTICULARS FOR 3 PHASE 4 WIRE LT STATIC TRI-VECTOR ENERGY METER FPR GENERETION MONITORING, DLMS CATEGORY 'C'

S.N.	Particulars	Technical Specifications
1	Type & make	3 Phase 4 Wire
2	Standard Applicable	IS:13779(1999), DLMS IS: 15959 Category C / CBIP report – 88 (with latest amendment)
3	(i) Accuracy class	1.0
	(ii) Rated voltage	230V (P-N)
	(iii) Rated current	20-100A Direct
	(iv) Rated frequency	50Hz
4	Starting current (Min) at which meter shall run & continue to run	0.2% of Ib
5	Communication port	Two communication port • One galvanically isolated optical port (1107). For Local Reading ▪ Additional RS 232 port (RJ 11 connector) for modem communication
6	Battery backup	Two Lithium battery inside the meter. One for RTC backup & other for mains off operation.
7	Materials to be used	
8	(i) Base	Engineering Plastic.
	(ii) Terminal block	Engineering Plastic.
	(iii) Meter cover	Engineering Plastic with display window of UV stabilised polycarbonate.
	(iv) Terminal cover	Engineering Plastic.
	(v) Screw	electroplated Brass
	(v) Screw size	M - 4 ⌟ 6mm
9	Type of display	7 segment LCD

	(i) No. of Digits display	7 digit 7 segment LCD display (High resolution display for the energy will be provided, in which minimum four digit after decimal will be provided).
	(ii) Character size of display	10x5 mm
	(i) Fixing of meter	3 Fixing holes (One at top & two at bottom terminal block)
10	(ii) Sealing provision	At terminal cover, MD Button, Communication port, Meter Body
11	Event record on meter in tamper condition	Should be capable as per relevant standards.
12	Size of calibration LED and colour	3mm Red
13	Relative humidity	95% (some time approaches to saturation).
14	Ref. Temperature	27°C
15	Temperature range of operation	-5 to 55°C
16	Drift in accuracy of measurement with time	No appreciable drift in accuracy in measurement with time.
17	Fixing arrangement of name plate	Secured and indelibly marked name plate (rating plate) will be fixed to the meter under display window.
18	Approximate weight of meter	*2 Kg ∟ 0.2 Kg.
19	Type of body	Projection type
20	Demand Integration Period	15min
21	MD Reset	Auto Reset at 24:00 hrs at the end of each billing cycle
22	Marking	The marking of the meters shall be IS 13779 DLMS- Category C as per IS 15959
23	Apparent calculation	Lag Only
24	TOD timing (Both MD & Energy)	00 : 00 Hrs to 06 : 00 Hrs 06 : 00 Hrs to 24 : 00 Hrs There will be a provision of at least 8 TOD zones for Active & Apparent Energy & Demand
25	Non volatile memory to record history	HISTORY TOD MD – 6 months All Energy – 6 months
26	Compliance	OERC Order on Net Metering (Aug 2016 as amended upto 17-01-2018)
27	Acceptance	Same type of meter tested at Standard Testing Laboratory, Bhubaneswar
		Same type of meter tested at CESU MRT Laboratory, Bhubaneswar
28	MODEM	GPS/GPRS suitable for above meter
	Capability	Remote Data reading (RMR)
	Facility	Sealing provision
	Status	Through LED
	Provision	SIM CARD slot
	Compliance	Class 10
	Power supply	240VAC, 50Hz
	SERVER	WEB
	Monitoring over Client PC	Check healthiness of Plant, Total & Plant wise generation – daily, weekly, monthly. Maximum demand, Power on-off time and duration, Events, Auto email reports
29	Billing requirements :	Generated and Consumed energy, Active, Reactive, Apparent, PF, Demand, Support of different tariff structure like Flat & TOD.
30	Analysis & Services	Customized dashboard, Plant load factor, ROI tracking, Tracking per day expected revenue v/s actual revenue, Loss, Best performing plants, Best day, Carbon footprint reduction, Time to payback, Promised capacity & delivered

31	Box	Polycarbonate Box (size 380mm x 310mm x 117mm) to mount meter, & Modem

Sd/-
Joint Manager (Elect)

ANNEXURES

SAMPLE FORMAT FOR C.M.C (Annexure A)

(Subject to modification as per suitability of system and project requirement)
Comprehensive Maintenance Contract (CMC) for maintenance of SPV power plant supplied and install by M/S …….
……
for five years.

This Comprehensive Maintenance Contract (CMC) is executed between the THE ODISHA STATE POLICE HOUSING & WELFARE CORPORATION LTD.,JANAPATH, BHOINAGAR, BHUBANESWAR – 22., represented by its Joint Manager, Electrical Division herein after called as Ist. party and M/S
…….
……
herein after called as 2nd party, for maintenance of …….. sets of ..... for a period of five years with effect from..... AD, supplied, installed and commissioned vide purchase order No ……. Dated …… in …….. village …….. blocks of …….
Districts.
The 2nd party will maintain these..... Systems as per the terms and conditions mentioned here under.

1. It has been envisaged in the purchase order No ……../ ED/OPHWC dated . under clause No …… that these …… No/sets of..... shall be warranted against any manufacturing defect and bad workmanship at least for a period of 5 years for the system and battery and 10 years for the PV modules from the date of commissioning . As these systems have been commissioned and handed over to the User Authority through 1st party at ……. During …….. all these systems , as such are covered under warranty period up to ……, …….. and respectively.
Hence, the 2nd
party is fully responsible for their trouble free maintenance
and the 2nd party is liable to rectify / remove any defect noticed within the aforesaid period free of cost.
2. The 2nd party will impart training to two nos. of designated person of the User Authority to be able to provide first aid repair service for the SPV systems installed.
3. The 2nd party will ensure a formal training of such designated person of the User Authority in consultation with the 1st party.
4. The CMC includes repair/ replacement of complete systems, including all necessary components, sub-components, spares, tools, tackles etc during the maintenance period.
5. The 2nd party shall undertake the periodical maintenance work of the system on the 10th of every succeeding quarter duly countersigned by User Authority.
6. The 2nd party should be in readiness to attend to the defects of the system as and when

required by the User Authority and ensure rectification of defects and restore functionality within seven days of lodging the complaints. The 2nd party shall furnish the status report after the maintenance work are over, which shall invariably bear the signature of the User Authority.

7. The 2nd party shall appraise the User Authority about the requirements and supply of spares during warranty as well as CMC period.

8. The 2nd party will ensure to submit quarterly reports of visits made by their representatives to the project site every three months during the warranty and CMC period.

9. Certificates in support of successful maintenance of the system(s) shall be obtained from the User Authority in token of verification of maintenance done.

10. It will be the liberty of the 1st party to cross checks the systems maintained by the 2nd party. Random verification of the maintenance may be carried out by the 1st party wherever necessary.

11. The 2nd party may continue to maintain the gadgets after expiry of the maintenance period of 05 years , provided the OPHWC / User Authority desires.

12. For adjudication of any dispute between 2nd party and User Authority arising on execution of this CMC, the matter shall first be brought to the notice of OPHWC.

13. In case, there will be no amicable settlement of the issues, the matter can be referred to the court of law having jurisdiction at Bhubaneswar only. The Annual Maintenance contract is signed jointly between the two parties today i.e on dated and shall come into force from the date of its
signature(s).

For and on behalf of OPHWC, Bhubaneswar

……..

For and on behalf of M/S
(1stParty) …….
(2ndparty) ..... with Seal

Format of Monthly Generation Report (Annexure B)

(Report will contain Daily Average data and to be submitted on monthly basis)

Sl. No	Particulars to be reported	Description
1	Name of Project site along with GPS Co-ordinates	
2	Capacity of Solar Power plant	
3	Capacity of Solar Inverter	
5	Monthly Average Solar PV generation	
6	Monthly Average Power consumption	
7	URL of Remote Monitoring System	
8	User Id and Password of Remote Monitoring system	

Signature with seal of the Bidder

Periodic Maintenance Protocol for Solar power plants/packs (Annexure-C)

Sl No	Task	Quarterly	Semi-annual	Annual	Bi-annual
1	PV Array				
a	Inspect each PV modules for damage	■			
b	Observe PV array shading and take corrective measures	■			
c	Clean array with water and remove debris around array	■			
d	Inspect array mounting structure, check for loose fasteners, corrosion, broken/ damaged concrete footings etc. and take corrective measures, if necessary.		■		
e	Check array junction box, all wires and cables and take corrective measures if necessary.	■			
f	Adjust tilt angle , if necessary		■		
g	Check array current & voltage. If required each module current, voltage & bypass diode condition.	■			
h	Check for any loose contacts in the string connection(+ve/-ve MC4 connectors)				
2	PCU				
a	Check inverter and/or charge controller for correct settings	■			
b	Check Inverter capacity and max allowable load using dummy load.			■	
c	Ventilation fan condition/filter cleaning				
d	Check all the parameters (I/P & O/P) as per Manufacturer datasheet for any Malfunctioning				
3	Protection devices				
a	Check for continuity of lightening arrestor		■		
b	Check system earthing		■		
c	Check all SPDs		■		
d	Check all bypass/ blocking diodes and take corrective measures if necessary.		■		

Signature with seal of the Bidder

Model Bank Guarantee Format for Performance Security (Annexure D)

Annexure-II of Finance Department Office Memorandum 4939 dtd 13.2.12, Govt of Odisha
[Ref Para 22(i1]

To

WHEREAS---------- *(name* and address of the supplier) (hereinafter called "the supplier") has undertaken. in pursuance of contract no---------- dated---------- to supply---------- (description of goods and services) (herein after called "the contract")' AND WHEREAS it has been -stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein, as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee; NOW THEREFORE we hereby affirm that we, are guarantors and responsible to you on behalf of the supplier. upto a total of ---------- .(Amount of the guarantee in words and figures).and we undertake to pay you. Upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as afore said. Without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your- demanding the said debt from the supplier before Presenting us with the demand.

We further agree that no change or addition to or other 'modification of the terms of the contract to be performed there under or of any of the contract documents **--**which may be made between you and the supplier 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 day of----------20 ----- Our branch at * (Name & Address of the_____* branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our --- * branch a written claim or demand and received by us at our _____ * branch on or before Dt---------- otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

(Signature of the authorized officer of the Bank)
Name and designation of the officer

Seal.name& address of the Bank and address of the Branch

Component wise Test Reports (Annexure H)

S/N	Major Component	Test Certificates Required	Test description	Designated Test Labs
1	Crystalline Silicon Terrestrial PV Modules	IEC 61215	Design qualification	UL India(up to 400 Wp), TUV Rheinland(up to 400 Wp) , NISE(up to 100 Wp), ETDC
		IEC 61730	Safety Qualification	UL India(up to 400 Wp), TUV Rheinland(up to 400 Wp)
		IEC 61701	Salt Mist Corrosion Test	UL India(up to 400 Wp), TUV Rheinland(upto 350 Wp), ETDC (up to 100 Wp)
2	Power Conditioning Units(PCU)/ Inverter*	IEC 61683	Efficiency Test	UL India, TUV Rheinland, NISE, ERTL, ETDC, CPRI, ERTL North, Intertek
		IEC 60068	Environmental Test	UL India (upto 250 KVA), TUV Rheinland, NISE, ERTL,ETDC,CPRI, ERTL, Intertek
		IEC 62116	Anti Islanding Protection	UL India, TUV Rheinland, NISE, ERTL, ETDC, CPRI, ERTL North, Intertek
		IP 65/56	Ingress Protection for Outdoor/Indoor Enclosure	TUV Rheinland, NISE

*All Test reports must be authorized by MNRE designated Test Labs

Signature with seal of the Bidder

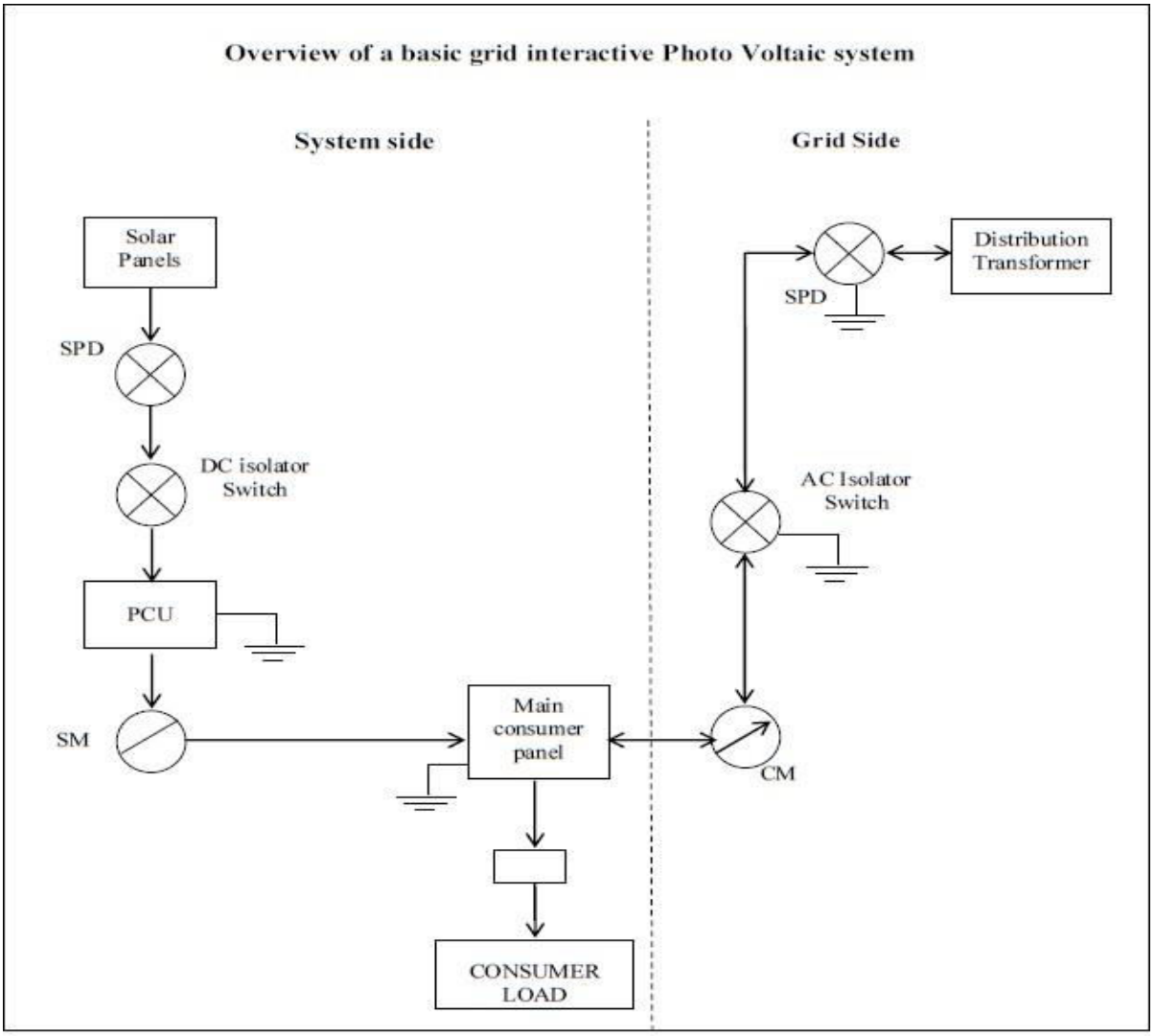
Sl No	Critical Documents required (Annexure I)
1	*Contact information of Various Stakeholders such as PV System Owner, Project developer, EPC Contractor, designer, lending agency, etc…
2	Datasheets of key equipments and the overall PV system
3	SLD, Equipment Layout Diagram &Earthing wiring diagram
4	***Warranty Certificates of Key Equipments by OEM in the name of User Auhority**
5	Design Document of the Module mounting Structure
6	Warranty Document of the entire Rooftop PV System as a whole by the Installer
7	Generation estimation report based on realistic weather conditions
8	*Operation &Maintenance manual of the PV System
9	***Purchase Bills & Service Agreements between Vendor & Manufacturer**

***These documents may be submitted after completion of work along with JCC.**

Contact Person Name & Contact No. of OPHWC (Annexure J)

Sl No	Project Name	Contact Person Name	Contact No.
1	10 kWP Grid connected Rooftop Solar PV Plant at Cyber Police Station, Bhubaneswar.	Er. Jnana Ranjan Panda. Er.Suryakant Biswal.	9438061997 9438032199

Annexure K (Single Line Diagram)



SPD- Surge Protective Device, PCU- Power Conditioning Unit, SM-Solar Generation Meter, CM- Consumer Meter (Net meter or Bi-directional meter)

Letter of Authorization (Annexure M)

(to be submitted in the letter head of the bidder)

To,

The Joint Manager
Electrical Division
OPHWC, Bhubaneswar.

Sub: Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of 10 KWP. Grid connected Rooftop Solar Projects at Cyber Police Station, Bhubaneswar.

Ref: **TENDER CALL NOTICE NO: - /JM / ELECT / OPHWC/ 2019-20**

Sir,

I/we hereby authorise Ms. /Mr. _____ , Designation .....of our company to sign all relevant documents on behalf of the company/firm in dealing with the above tender. She / He is also authorized to attend all meetings and submit technical and commercial information as may be required by OPHWC in the course of processing of the tender.

We further authorise Ms. /Mr._____ designation..... of our company to make technical presentation on behalf of the company.

Signature of the authorise persons

Yours faithfully

Signature with seal of the Bidder

Certificate of Unconditional Acceptance of the tender (Annexure O)

(To be submitted on the letter head of the company)

We_____

a prospective bidders for the work of "Design, Supply, Installation, Testing, Commissioning and Comprehensive Maintenance Contract for a period of 05 (five) years of 10 KWP Grid connected Roof Top Solar Power Systems (through Net Metering) at Cyber Police Station Building, Bhubaneswar. " here by certify that we have carefully studied and understood the contents of the entire bid document hoisted on the website of OPHWC and hereby confirm our unconditional acceptance to each and every line of the said bid document.

Signature with seal of the Bidder

Confirmation to Technical Specifications (Annexure Q)

(To be submitted on the letter head of the company)

Certified that we have carefully read and understood the technical specifications of the products and services to be provided under this tender and we hereby confirm our total adherence to the given technical specifications. The test certificates provided by us also base on the same technical specifications/ parameters.

Signature with seal of the Bidder

PRICE BID FOR DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND COMPREHENSIVE MAINTENANCE CONTRACT FOR A PERIOD OF 05 (FIVE) YEARS OF 10 KWP GRID CONNECTED ROOF TOP SOLAR POWER SYSTEMS (THROUGH NET METERING) AT CYBER POLICE STATION BUILDING, BHUBANESWAR.

BID REFERENCE NO:-23/ JM/ ELECT /OPHWC/2019-20

Sl No	Description of work	Quoted Amount Rs.
1	Design and Supply of materials for 10 KWp Grid connected Roof Top Solar Power Systems (through Net Metering) at Cyber Police Station Building, Bhubaneswar as per the technical specification given in the tender along with Generation Meter & Net Meter as per OERC guidelines.	
2	GST @ 5% on Sl.No – 1	
3	Cost of Installation, Testing and commissioning of the system.	
4	GST @ 18% on Sl.No – 3	
5	CMC charges for 5 years from the date of Commissioning 1st year 2nd year 3rd year 4th year 5th year	
6	GST @ 18% on Sl.No – 5	
7	**Total Quoted Amount [1+2+3+4+5+6]**	
8	**Total Estimated cost inclusive of all taxes and GST**	**Rs.5,00,000.00**

Please Tick

Excess ☐

Less ☐

Quoted amount in figure :-

_____ % Quoted amount in words:-

Sd/-

Signature with seal of the Bidder **Joint Manager (Elect)**

CERTIFICATE OF NO RELATIONSHIP

BID REFERENCE NO:-23/ JM/ ELECT /OPHWC/2019-20

I/We hereby certify that I/We am/are **related/not related** to any officer of OSPH&WC of the rank of Deputy Manager & above . I/We am/are aware that, if the facts subsequently proved to be false, my/our contract will be rescinded with forfeiture of E.M.D and security deposit and I/We shall be liable to make good the loss or damage resulting from such cancellation.

I//We also note that, non-submission of this certificate will render my / our tender liable for rejection.

N:B :- Strike out which is not applicable.

Signature with seal of the Bidder

Date:-

RELATIONSHIP DECLARATION

BID REFERENCE NO:-23/JM / ELECT /OPHWC/2019-20

To,
The Tender Inviting Officer,
Subject: (Name of the Work)
Reference: (Bid reference number)

Sir,

Pursuant to clause 29 of the General Condition of the Contract, it is to inform that I have relative(s) employed as an officer of OSPH&WC of the rank of Deputy Manager & above .His /Her (Their) details are as follows.

Relationship**:**
Name**:**
Designation **:**
Office **:**
Address **:**

Pursuant to clause 29 of the General Condition of the Contract, I am to submit herewith the names of persons who are working under my firm having near relative (s) employed as an officer of OSPH&WC of the rank of Deputy Manager & above. His/her (Their) details are as follows.

Sl No.	Name of the my employee and his designation in the firm	Presently working at	Details of his relatives working in the Department
1.			Relationship Name: Designation Office Address

I am also duty bound to inform the relationship of any subsequent employee to any officer of OSPH&WC of the rank of Deputy Manager & above. I am aware that any breach of this condition would render my firm liable for penal action for suppression of facts.

Yours Sincerely

Signature with seal of the Bidder
Date:-

Total: - 39 (Thirty nine) pages only.

APPROVED

Sd/-

Joint Manager (Elect)