Office of the Chief Engineer, Distribution, Jammu
Jammu Power Distribution Corporation Limited, Panama Chowk, Jammu
e-mail: cedistributionjpdcl@gmail.com
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Tender document for Expression of Interest (EoI)

(for JPDCL wise empanelment)

For

Empanelment of agencies/firms to work as Solar Power Developers in market mode for Site Survey, Design, Supply, Installation andCommissioningincludingWarranty,ComprehensiveMaintenanceContract(CMC) for Five(05)years of Grid-Connected Solar Photovoltaic Power Plants of different capacities launched by MNRE GoI Under Pradhan Mantri Surya Ghar: Muft Bijli Yojana in respect of Domestic Consumers of JPDCL UT of J&K

EoI No: **CEJ/TS-II/EOI/1355** ***Dated:25.06.2024***

Issued by:
Chief Engineer (Distribution)
Jammu Power Distribution Corporation Limited (JPDCL)
Jammu

e-mail: cedistributionjpdcl@gmail.com

DISCLAIMER

1) Though adequate care has been taken while preparing the tender/EOI document, the Vendor(s) shall satisfy themselves that the document is complete in all respects. Intimation regarding any discrepancy shall be given to the office of the Employer immediately. If no intimation is received from any Vendor within 7 (Seven) days from the date of issuance of Tender documents, it shall be considered that the document is complete in all respects and has been received/ acknowledged by the Vendor(s)

2) JPDCL reserves the right to modify, amend or supplement this document.

3) While this tender document has been prepared in good faith, neither JPDCL nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.

4)

Place: Jammu
Date:25th June'2024

1.0. The brief details of the tender/EOI are as under:

Table-1: Tender Details

(A)	Name of Work	Expression of Interest (EoI) for Site Survey, Design, Supply, installation and Commissioning including Warranty, Comprehensive Maintenance Contract (CMC) for Five (05) years of Grid Connected Solar Photovoltaic Power Plants on Residential Buildings in UT of J&K under Pradhan Mantri Surya Ghar: Muft Bijli Yojana for the domestic consumer of JPDCL.
(B)	EoI No.&Date	CEJ/TS-II/EOI/1355 Dated: 25.06.2024
(C)	Cost of Bidding Document	Rs. 10000 including GST (Rupees Ten Thousand only in the form of DD favouring Chief Engineer, Distribution, JPDCL, Jammu. Vendors can download the EOI document from JPDCL website . Submit the cost of the document / processing fee of requisite value as applicable alongwith hard copy of the EOI document. EOI application without the cost of EOI document / processing fee would be rejected.
(D)	Performance Bank Guarantee	Vendors who wish to qualify for the EoI shall submit a Performance Bank Guarantee (PBG) of Rs. 2.5 lakhs in the form of CDR / FDR pledged to the Chief Engineer, Distribution, JPDCL, Jammu after they have successfully been processed by JPDCL Screening committee which shall meet every month for six month for vendor evaluation. This shall remain valid for 5 years for a quantity of 100 kWp project Completed. Thereafter for every additional quantity of 100 kWp, the PBG of Rs. 2.5 lakhs need to be resubmitted. The valid PBG's received at JPDCL Circle level against our earlier EOI shall be entertained and only one PBG of Rs. 2.5 Lacs valid for

		atleast 5 years in respect of one vendor shall be retained at Discom level and remaining PBG's shall be released or returned to the vendor.
(E)	Availability of Tender Document on Website(S)	https://www.jpdcl.co.in
(F)	Due Date, Time for Submission of EOI Document	Date: 13.07.2024 upto 3 P.M at the first instance . However the vendors can express their interest thereafter as well which shall be evaluated by the Screening Committee which shall meet every month for six month for vendor evaluation.
(G)	Due Date, Time for Submission of EOI Related Queries	Date:03.07.2024 (upto 03:00 pm)
(H)	Validity Of Offer	As per the scheme guidelines.
(I)	Contact Details of EOI Dealing Officer	1. Chief Engineer, Distribution, JPDCL, Bhagwati Nagar, Jammu e-mail: cedistributionjpdcl@gmail.com 2. Executive Engineer, Sub Transmission Div-II, JPDCL, Jammu, Panama Chowk, Jammu e-mail: xenstd2@gmail.com

In case of the days specified above happens to be a holiday in JPDCL, the next working day shall be implied.

i. Bids must be submitted strictly in accordance with the instructions stated in the bidding document. This Notice is an integral and inseparable part of the bidding document.

ii. The EoI Document calls for offers on single point from eligible Vendors in total compliance of the Tender Document.

iii. Any revision, clarification, corrigendum, time extension, etc. to this EoI Document will be hosted on the above-mentioned website(s) only. Vendors are requested to visit the website regularly to keep themselves updated.

iv. JPDCL reserves the right to reject any or all the bids received at

its discretion without assigning any reason whatsoever.

For & on behalfof JPDCL
Designation:
Chief Engineer, Distribution,
JPDCL, Bhagwati Nagar, Jammu
e-mail: cedistributionjpdcl@gmail.com

Forwarding Letter

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

Chief Engineer (Distribution)
Jammu Power Distribution Corporation Limited (JPDCL)
Jammu

Sir,

Subject: - **Submission of EoI for Empanelment& Installation Capacity for Site Survey, Design, Supply, Erection and Commissioning including Warranty, Comprehensive Maintenance Contract (CMC) for Five (05) years of Grid Connected Rooftop Solar Photovoltaic Power Plants of different capacities as per MNRE guidelines under Pradhan Mantri Surya Ghar: Muft Bijli Yojana for the domestic consumers of JPDCLin UT of J&K.**

Reference: - CEJ/EOI/ Dated:

Dear Sir,

Having studied the EoI carefully I/we, the undersigned, offer to submit our EoI for empanelment for Site Survey, Design, Supply, Erection, Testing and Commissioning including Warranty, Comprehensive Maintenance Contract (CMC) for Five (05) years of Grid Connected Rooftop Solar Photovoltaic Power Plants as per technical specifications of MNRE, GoI.

We have read the provisions regarding Design, Supply, Installation and Commissioning including Warranty, Comprehensive Maintenance Contract (CMC) for Five (05) years of Solar Photovoltaic Power Plants I/We have also read the various provisions of the EoI and confirm that the same are acceptable to us**for the installation capacity _____ KWp**. We further declare that any additional conditions, variations, deviations, if any, found in our EoI offer shall not be given effect. We further understand that any deficiency / illegibility in documents shall make our EoI liable for rejection.

I/we submit our EoI, understanding fully well that: -

a) The EoI and other documents submitted along with the same will be subject to verification by appropriate authorities.
b) JPDCL reserves the right to accept or reject any application or the EoI process itself without assigning any reasons thereof and shall not be held liable for any such action.
c) All acts, rules, regulations, norms and conditions of Govt. of India and Govt. of Jammu and Kashmir shall be applicable during the process of EoI. We hereby declare that all the information and statements made in this proposal are complete, true and correct and also accept that any misinterpretation contained in it may lead to our disqualification.
d) I/we shall adhere to all the guidelines and technical specifications issued by the Ministry of Renewable and New Energy, GoI and JPDCL (Discom) from time to time.
e) I/we shall strictly adhere to the standards specified by CEA / MNRE GoIand installations of electrical equipment must comply with Indian Electricity rules in vogue and amended from time to time and also to follow power quality measures as per International or Indian standards and /or other such measures provided in notification issued by JERC for the UT's vide no. JERC-24/2019 dt: 24.07.2019 and other regulations in vogue.
f) I/We have submitted the application for empanelment in JPDCL Circle Jammu JPDCL.
g) I/We shall comply with all the guidelines/directions, regulations, notifications, Supply code, circulars, and tariffs etc issued by MNRE and JERC for UT of J&K & L0adakh from time to time. We will always work in good faith for JPDCL and maintain loyalty in all our endeavours.

I/We hereby declare that our EoI is made in good faith and the information contained is true and correct to the best of our knowledge and belief.

Yours faithfully,

Signature of Firm/Vendor authorized representative

1. Background:

The Hon'ble Prime Minister has launched the "PM Surya Ghar: Muft Bijli Yojana" on 13.02.2024 with a financial outlay of over INR 75,000 Crore, aimed at solarizing 1 Crore households by providing free electricity up to 300 units every month. The Hon'ble Finance Minister has also announced the proposed scheme in the budget speech presented in the Parliament on 1st Feb, 2024. This concept note details out the architecture of the proposed Pradhan Mantri Surya Ghar: Muft Bijli Yojana (PMSG:MBY), scheme structure and approach as well as key strategy elements for deployment of Rooftop Solar in India.

The Aims and Objectives of "PM Surya Ghar: Muft Bijli Yojana" are:

The Hon'ble Prime Minister has launched the "PM Surya Ghar: Muft Bijli Yojana" on 13.02.2024 with a financial outlay of over INR 75,000 Crore, aimed at solarizing 1 Crore households by providing free electricity up to 300 units every month. The Hon'ble Finance Minister has also announced the proposed scheme in the budget speech presented in the Parliament on 1st Feb, 2024. The aims and objectives of the revamped scheme for rooftop solar are:

a. To achieve 1 Crore rooftop solar installation in residential sector.
b. To help provide free/low-cost electricity to 1 crore households up to 300 units of electricity per month by installation of rooftop solar
c. To produce renewable electricity of 1000 billion units through the capacity installed under the programme, which will result in reduction of 720 million ton of CO_2eq emission during the 25 years of lifetime for rooftop solar projects.
d. To develop the required enabling ecosystem for rooftop solar projects, including regulatory support, manufacturing facilities, supply chain, vendor network, operation & maintenance facilities, etc., in the country.
e. To boost local economy and employment generation along with enhanced energy security.
f. To aid in achievement of India's commitment for green climate through its NDCs (Nationally Determined Contributions) at UNFCCC by installation of 30 GW of solar capacity through rooftop solar by FY 2026-27.

2. Introduction:

2.1 MNRE has launched a scheme for promotion of Grid Connected Rooftop Solar PV projects. The generated solar power may be utilized for captive application and the surplus power, if any, may be fed to the grid on Net Metering basis. The scheme aims to reduce the consumption of fossil fuel-based electricity and make buildings self-sustainable from the point of energy consumption, to the extent possible.

2.2 This scheme with aggregate Solar capacity in UT of J&K envisages installation of grid-connected rooftop solar PV projects on the roofs/premises of domestic consumers of JPDCL in UT of J&K.

Category	Coverage of Buildings
Domestic	All types of residential buildings in UT of Jammu and Kashmir (Domestic Consumers of JPDCL)

2.3 The interested firms/vendors who fulfil the formalities as specified in the EoI,, shall be empaneled with JPDCL. The registration / empanelment of vendors will be valid initially for one year from the date of empanelment and can be renewed thereafter on yearly basis.

2.4 Central Financial Assistance for Residential Sector shall be as per the following table:

Average Monthly Electricity Consumption (units)	Suitable Rooftop Solar Plant Capacity	Subsidy Support
0-150	1 – 2 kW	Rs 33,000 to Rs 66,000/-
150-300	2 – 3 kW	Rs 66,000 to Rs 85,800/-
>300	Above 3 kW	Capped at Rs 85,800/-

2.5 Online Applications may be submitted on the National Portal at **https://pmsuryaghar.gov.in**

3. ELIGIBILITY CRITERIA:

3.1 General

The Vendor should either be a body incorporated in India, under the Companies Act, 1956 or CompaniesAct,2013 including any amendment there to and engaged either in manufacturing and/or as a system integrator in the business of Solar Power, OR under the Limited Liability Partnership Act 2008, proprietorship and Partnership Firm engaged in the business of Solar Power /Solar Plant System Integrators. A certified copy of the registration certificate of the Vendor for any of the above and the requisite tax payee number TIN & GST etc. from competent government authority with whom the Vendor is registered shall be enclosed with the tender.

3.2 Technical Criteria

3.2.1 The Vendor must have experience of having successfully completed works for Supply, Installation and Commissioning of Grid Connected/ Off Grid Solar projects of MNRE having aggregate capacity not less than 100kwp which should have been successfully commissioned in the last three years prior to the Techno-Commercial Bid opening date.

3.2.2 For UT Registered MSME: The Vendor who are local MSME's and are registered under the MSME Development Act 2006 in the UT of J&K are exempted from the technical eligibility requirements. The firm should be technically and financially sound and having atleast one member of relevant Electrical or Electronics Engineering background and having a relevant years of experience in Solar field / business. However the empanelment would be made after proper assessment by the JPDCL screening committee.

3.2.3 The Vendor should have a qualified and an experienced technical team headed by ateam leader.

3.3 Supporting Documents to be submitted

3.3.1 A certified copy of the registration certificate and the requisite tax payee number TIN & GST.

3.3.2 The Vendor being a local MSME must submit a valid copy of the certificate of registration issued by an appropriate authority. This is applicable for the UT Govt. registered MSME's.

3.3.3 In support of technical criteria

a) Copy of Contract(s) / Work order(s) with copy of relevant pages

of the scope of work with documentary evidence of works executed.

b) Copy of completion/ commissioning certificate(s)/ proof of completion/commissioning of the said work(s) along with documentation establishing completion of work by the Vendor with reference to work order(s) / contract(s).The Vendors must submit the completion certificate issued by end user/ owner only after completion of work / supply in all respect.

3.3.4 **Financial Eligibility Criteria**:

For General Vendors:

(a) The Vendor should have minimum Average Annual Turnover or Net worth as indicated below to qualify for the financial eligibility criteria:

The Vendor should have minimum Average Annual Turnover of Rupees 15000 per kW of the capacity offered in the bid for the Grid connected Roof Top Solarin any one of the last 03 financial years subject to the condition that the Vendor should at least have completed one financial year.

OR

Net worth equals to or greater than the value calculated at rate of Rs.7500 per kW of capacity of the capacity offered in the bid for Grid connected RTS. The Computation of Net worth shall be based on unconsolidated audited annual accounts of the last financial year immediately preceding the Bid Deadline and certified by CA. The Vendor shall provide a copy each of audited annual report to ascertain their turnover.

b) In case more than one EOI is submitted by the Vendor in JPDCL, the financial eligibility criteria must be fulfilled by such Vendor for the sum total of capacities being offered in the bid.

c) For UT registered MSME's: The Vendor who are local MSME's and are registered under the MSME Development Act 2006 in the UT of J&K are exempted from the financial eligibility requirements. The Vendor being a local MSME must submit a valid copy of the certificate of registration issued by an appropriate authority. This is applicable for the UT Govt. registered MSME's.

d) The detailed financial criteria of the Vendor should be given on a separate page authenticated by the Chartered Accountant

4 EoI Conditions

a) No extra amount than the following amount as per Capacity identified below shall be charged.

S.No.	Capacity	Benchmark Cost (INR KWp Special category State / UT Including applicable fees , CMC, Insurance &Taxes
1	1 kWp	Rs. 55000/-
2	Above 1 KWp -2 kWp	Rs. 55000/
3	Above 3 KWp – 10 KWp	Rs. 49500/

b) In case any of complain verbally or in written received that additional amount has been charged, the empanelled vender would immediately be removed from the vendor list and his PBG shall be encashed.

c) The Firms are allowed to offer discount(s) on the rates as mentioned above to attract more beneficiaries.

d) Minimum of Three (3) vendors in each JPDCL Circle would be empanelled for implementation of the project initially and their empanelment would be made as per their technical & financial capabilities or past performance and experience in the solar sector.

e) The vendors must provide their service in all the districts of Jammu. JPDCL has the right to cancel their empanelment if any adverse report regarding not providing their services in any district is received from any domestic consumer of JPDCL either verbally or in written form. JPDCL decision will be full and final in this matter..

f) In order avail subsidy through DBT by the consumer , the empanelled vendor must only use Domestic make Solar Panel Uit. Any Non-DCR panel installed will out rightly be rejected for the case of availing subsidy under PM Surya Ghar Muft Bijli yojana..

5 Scope of Work:

The Vendor should act for providing an End-to-End solution for their identified locations including but not limited to Site survey, design, supply of the required Solar Photovoltaic power plant, with all accessories, grid tied inverter, a bidirectional meter, peripherals like cables, junction boxes, earthing etc. and applicable warranty etc. and its installation and successful commissioning. The empanelled vendors have to ensure planning and smooth

execution of the project immediately within 30 days after collection of required amounts against proper receipt from the prospective beneficiary. If the work is not satisfactorily executedas per the MNRE guidelines, the empanelment of the vendor shall be cancelled and the PBG would be encashed.

The vendor has following responsibilities:

a) The registered / empanelled vendor selected by the beneficiaries will conduct the physical survey to assess the Roof Top Solarcapacity and guide the beneficiary on the RTS capacity that can be installed in the beneficiary's premises considering technical and financial parameters. The vendor shall also provide assistance to the beneficiary in getting necessary approvals, installing the met-meter and facilitating inspection by the JPDCL. The vendor must guide the beneficiary on the RTS capacity that can be installed in the beneficiary's premises considering technical and financial parameters. The vendor shall also provide assistance to the beneficiary in getting necessary approval, installing the Net-meter and facilitating inspection by the JPDCL.

b) The empanelled vendor shall strictly adhere to the standards specified by CEA / MNRE and installations of electrical equipment must comply with Indian Electricity rules in vogue and amended from time to time and also to follow power quality measures as per International or Indian standards and /or other such measures provided in notification issued by JERC for the UT's vide no. JERC-24/2019 dt: 24.07.2019.

c) Providing the Net-meter and facilitating its installation through JPDCL as per the guidelines of JERC regulations. In case of installation of Smart meter by the JPDCL, the vendor has to facilitate the consumer in enabling activation of bi-directional feature of the Smart meter.

d) Supply of complete system (BOQ) as per technical specifications given by MNRE, GoI specifications / appropriate IS standards**.** The detailed Technical Specifications are also given in this EOI for reference and following the same on strict basis.

e) It is responsibility of the empanelled Firm/vendor to facilitate submission of the data on designated portal software of MNRE as well as submission of the Subsidy documents of proposal for obtaining the CFA/UT subsidy in prescribed format as per the MNRE guidelines on the National portal https://pmsuryaghar.gov.in

f) Installation of the supplied systems and commissioning of the same as per the prevailing electrical norms on the rooftops within the premises

of the beneficiaries. The date of commencement of CMC shall be reckoned from the date of commissioning of the system.

g) The beneficiary shall be made aware about the use of system. Instruction and safety manual of RTS system, in English or Hindi languages should be provided to each beneficiary.
h) The successful Empanelled Vendor shall after completion and commissioning of the systems submit all details in the formats supplied by JPDCL from time to time.
i) Providing all 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 to ensure protection of life and property likely to be endangered due to the installed solar power plant.
j) Empanelled Vendor shall adhere to safety standards, reliability, operability & maintainability aspects, metering arrangement as per the standards, norms and regulations specified/notified by JERC from time to time for UT of J&K.

OTHER COMPLIANCES: -

a) While installing solar power plants on rooftops the physical condition of the roof should be taken in to consideration.
b) There should not be any damage what so ever to the rooftop due to installation of the solar power plant so that on a later day there is leakage of rain water, etc. from the rooftop.
c) In case small damages are inevitable for erecting the footings for the module mounting structure etc. the roof top may be given a suitable grading plaster with suitable leak proof compound so as to render the roof entirely leak proof.
d) If the rooftop does not have any access such as stairs or Ladder, a proper and safe ladder must be provided to ensure easy access to the roof top mainly for the purpose of maintenance and inspection.
e) 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. Inverter shall be fixed in a prominent place.

Annexure-A

TECHNICAL SPECIFICATIONS

The proposed projects shall be commissioned as per the technical specifications given below. Any shortcomings will lead to cancelation of CFA in full or part as decided JPDCL. Domestic Modules are to be used failing which it will be assumed that system is not matching the requirement of the scheme and bidder's PBG shall be forfeited. Competent Authority's decision will be final and binding on the bidder.

DEFINITION

A Roof Top Solar (RTS) Photo Voltaic (PV) system shall consist of following equipment/components:

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

1. Solar PV modules

The PV modules and Solar Cell used should be made in India.

The PV modules used must qualify to the latest edition of IEC standards or equivalent BIS standards, i.e. IEC 61215/IS14286, IEC 61853-Part I/IS 16170-Part I, IEC 61730 Part-1 & Part 2 and IEC 62804 (PID). For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701.

The rated power of solar PV module shall have maximum tolerance up to +3%.

The peak-power point current of any supplied module string (series connected modules) shall not vary by +1% from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be.

The peak-power point voltage of any supplied module string (series connected modules) shall not vary by + 2% from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be.

The temperature co-efficient power of the PV module shall be equal to or better than - 0.45%/°C.
Solar PV modules of minimum capacity 250 Wp to be used.
The PV Module efficiency should be minimum 19%.
Solar PV modules of minimum fill factor 75%, to be used.
All electrical parameters at STC shall have to be provided
The PV modules shall be equipped with IP 65 or better protection level junction box with required numbers of bypass diodes of appropriate rating and appropriately sized output power cable of symmetric length with MC4 or equivalent solar connectors. The IP level for protection may be chosen based on following conditions:

i. An IP 65 rated enclosure is suitable for most outdoor enclosures that won'tencounter extreme weather such as flooding.
ii. An IP 67 rated enclosure is suitable at locations which may encounter temporarysubmersion at depths of up to one meter.
iii. An IP 68 enclosure is recommended if there may exist situations of submergencefor extended periods of time and at substantial depths.

All PV modules should carry a performance warranty of >90% during the first 10 years,and >80% during the next 15 years. Further, module shall have performance warranty of >97% during the first year of installation—degradation of the module below 1 % per annum.
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 commissioning:
Defects and/or failures due to manufacturing.
Defects and/or failures due to quality of materials.
Nonconformity 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.

PV modules must be tested and approved by one of the NABL accredited and BIS approvedtest centers.

Modules deployed must use a RF identification tag laminated inside the glass. The following information must be mentioned in the RFID used on each module:

a. Name of the manufacturer of the PV module
b. Name of the manufacturer of Solar Cells.
c. Month & year of the manufacture (separate for solar cells and modules)
d. Country of origin (separately for solar cells and module)
e. I-V curve for the module Wattage, Im, Vm and FF for the module
f. Unique Serial No and Model No of the module
g. Date and year of obtaining IEC PV module qualification certificate.
h. Name of the test lab issuing IEC certificate.
i. Other relevant information on traceability of solar cells and module as per ISO 9001and ISO 14001.
j. Nominal wattage +3%.
k. Brand Name, if applicable.

Other details as per IS/IEC 61730-1 clause 11 should be provided at appropriate place. In addition to the above, the following information should also be provided:

i. The actual Power Output Pmax shall be mentioned on the label pasted on the backside of PV Module.
ii. The Maximum system voltage for which the module is suitable to be provided onthe back sheet of the module.
iii. Polarity of terminals or leads (colour coding is permissible) on junction Boxhousing near cable entry or cable and connector.

Unique Serial No, Model No, Name of Manufacturer, Manufacturing year, Make in India logo and module wattage details should be displayed inside the laminated glass.

2. Inverter/PCU

Inverters/PCU should comply with applicable IEC/equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683, IS 16221 (Part 2), IS 16169 and IEC 60068-2(1,2,14,30) /Equivalent BIS Std.

Maximum Power Point Tracker (MPPT) shall be integrated in the inverter/PCU to maximize energy drawn from the array. Charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS standard. The junction boxes/enclosures should be IP 65 or better (for outdoor)/ IP 54or better (indoor) and as per IEC 529 Specifications.

All inverters/PCUs shall be IEC 61000 compliant for electromagnetic compatibility, harmonics, Surge, etc.

The PCU/ inverter shall have overloading capacity of minimum 10%.

Typical technical features of the inverter shall be as follows-

- **i.** Switching devices: IGBT/MOSFET
- **ii.** Control: Microprocessor/DSP
- **iii.** Nominal AC output voltage and frequency: as per CEA/State regulations
- **iv.** Output frequency: 50 Hz
- **v.** Grid Frequency Synchronization range: as per CEA/State Regulations
- **vi.** Ambient temperature considered: -20°C to 60°C
- **vii.** Humidity: 95 % Non-condensing
- **viii.** Protection of Enclosure: IP-54 (Minimum) for indoor and IP-65(Minimum) foroutdoor.
- **ix.** Grid Frequency Tolerance range: as per CEA/State regulations
- **x.** Grid Voltage tolerance: as per CEA/State Regulations
- **xi.** No-load losses: Less than 1% of rated power
- **xii.** Inverter efficiency (Min.): >93% (In case of 10 kW or above with in-built galvanic isolation) >97% (In case of 10 kW or above without inbuilt galvanic isolation)
- **xiii.** Inverter efficiency (minimum): > 90% (In case of less than 10 kW)
- **xiv.** THD: < 3%
- **xv.** PF: > 0.9 (lag or lead)
- **xvi.** Should not inject DC power more than 0.5% of full rated output at theinterconnection point and comply to IEEE 519.

The output power factor of inverter should be suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustain fault in feeder line and against the lightning on feeder.

All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:

i. The name or trademark of the manufacturer or supplier;
ii. A model number, name or other means to identify the equipment,
iii. A serial number, code or other marking allowing identification of manufacturing location and the manufacturing batch or date within a twelve-month time period.
iv. Input voltage, type of voltage (a.c. or d.c.), frequency, and maximum continuouscurrent for each input.
v. Output voltage, type of voltage (a.c. or d.c.), frequency, maximum continuous current, and for a.c. outputs, either the power or power factor for each output.
vi. The Ingress Protection (IP) rating

Marking shall be located adjacent to each fuse or fuse holder, or on the fuse holder, or in another location provided that it is obvious to which fuse the marking applies, giving the fuse current rating and voltage rating for fuses that may be changed at the installed site.

In case the consumer is having a *3-ϕ* connection, *1-ϕ*/*3-ϕ* inverter shall be provided by the vendor as per the consumer's requirement and regulations of the State.

Inverter/PCU shall be capable of complete automatic operation including wake-up, synchronization & shutdown.

For CFA calculation, minimum of following two shall be considered:

i. Solar PV array capacity in KWp
ii. Inverter Capacity in KW

Integration of PV Power with Grid & Grid Islanding:

i. The output power from SPV would be fed to the inverters/PCU which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization.
ii. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known

as “islands.” Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided, if not available in inverter.

iii. MCB/MCCB or a manual isolation switch, besides automatic disconnection to grid, would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

3. Module Mounting Structure (MMS):

Supply, installation, erection and acceptance of module mounting structure (MMS) with all necessary accessories, auxiliaries and spare part shall be in the scope of the work.

Module mounting structures can be made from three types of materials. They are Hot Dip Galvanized Iron, Aluminum and Hot Dip Galvanized Mild Steel (MS). However, MS will be preferred for raised structure.

MMS Steel shall be as per latest IS 2062:2011 and galvanization of the mounting structure shall be in compliance of latest IS 4759. MMS Aluminum shall be as per AA6063 T6. For Aluminum structures, necessary protection towards rusting need to be provided either by coating or anodization.

All bolts, nuts, fasteners shall be of stainless steel of grade SS 304 or hot dip galvanized, panel mounting clamps shall be of aluminum and must sustain the adverse climatic conditions. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts.

The module mounting structures should have angle of inclination as per the site conditions to take maximum insolation and complete shadow-free operation during generation hours. However, to accommodate more capacity the angle of inclination may be

reduced until the plant meets the specified performance ratio requirements.

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. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5.

The upper edge of the module must be covered with wind shield so as to avoid build air ingress below the module. Slight clearance must be provided on both edges (upper & lower) to allow air for cooling.

Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The Empaneled Agency shall be fully responsible for any damages to SPV System caused due to high wind velocity within guarantee period as per technical specification.

The structures shall be designed to allow easy replacement, repairing and cleaning of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. Necessary testing provision for MMS to be made available at site.

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.

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

The Rooftop Structures maybe classified in three broad categories as follows:

i. Ballast structure

a) The mounting structure must be Non-invasive ballast type and any

sort of penetrationof roof to be avoided.

b) The minimum clearance of the structure from the roof level should be in between 70- 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.

c) The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.

ii. Tin shed

a) The structure design should be as per the slope of the tin shed.
b) The inclination angle of structure can be done in two ways- Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shedin Proper south direction with same tilt angle based on the slope of tin shed to get the maximum output.
c) The minimum clearance of the lowest point from the tin shade should be more then100mm.
d) The base of structure should be connected on the Purlin of tin shed with the properriveting.
e) All structure member should be of minimum 2 mm thickness.

iii. RCC Elevated structure: It can be divided into further three categories:

A. Minimum Ground clearance (300MM – 1000 MM)

a) The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30MM.
b) Base Plate – Base plate thickness of the Structure should be 5MM for this segment.
c) Column – Structure Column should be minimum 2MM in Lip section / 3MM in C- Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
d) Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C- Channel section. The minimum section should be 70MM in Web side (y-axis) and 40MM in flange side (x-axis).
e) Purlin - Structure purlin should be minimum 2MM in

Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.

f) Front/back bracing – The section for bracing part should be minimum 2MM thickness.

g) Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

h) For single portrait structure the minimum ground clearance should be 500MM.

B. Medium Ground clearance (1000MM – 2000 MM) (for reference only)

a. Base Plate – Base plate thickness of the Structure should be Minimum 6MM forthis segment.
b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C- Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C- Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

C. Maximum Ground clearance (2000MM – 3000 MM) (for reference only)

a. Base Plate – Base plate thickness of the Structure should be minimum 8 MM for this segment.
b. Column – Structure Column thickness should be minimum 2.6MM in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3MM in C-Channel section.
c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
e. Front/back bracing – The section for bracing part should be minimum 3MM thickness.
f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D. Super elevated structure (More than 3000 MM) (for reference only)

Base structure

a. Base Plate – Base plate thickness of the Structure should be 10MM for this segment.
b. Column – Structure Column minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
c. Rafter - Structure Rafter minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
d. Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4mm L-angle with the help of minimum bolt diameter of 10mm.

Upper structure of super elevated structure –

a. Base Plate – Base plate thickness of the Structure should be minimum 5MM for this segment.
b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

   If distance between two legs in X-Direction is more than 3M than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2MM thick, and bar should be minimum 12Dia.

   Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation.

   Foundation – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.

   g. If penetration on the roof is allowed (based on the client requirement) then minimum 12MM diameter anchor fasteners with minimum length 100MM can be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.

h. If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12MM diameter and length should be minimum 300MM.

Material standards:

i. Design of foundation for mounting the structure should be as per defined standards which clearly states the Load Bearing Capacity & other relevant parameters for foundation design (As per IS 6403 / 456 / 4091 / 875).

ii. Grade of raw material to be used for mounting the structures so that it complies the defined wind loading conditions (As per IS 875 - III) should be referred as follows (IS 2062 – for angles and channels, IS 1079 – for sheet, IS 1161 & 1239 for round pipes, IS 4923 for rectangular and square hollow section)

iii. Test reports for the raw material should be as per IS 1852 / 808 / 2062 / 1079 / 811.

iv. In process inspection report as per approved drawing & tolerance should be as per IS 7215.

v. For ascertaining proper welding of structure part following should be referred:

a. D.P. Test (Pin Hole / Crack) (IS 822)
b. Weld wire grade should be of grade (ER 70 S - 6)

vi. For ascertaining hot dip galvanizing of fabricated structure following should be referred: -

a. Min coating required should be as per IS 4759 & EN 1461.
b. Testing of galvanized material
   - Pierce Test (IS 2633)
   - Mass of Zinc (IS 6745)
   - Adhesion Test (IS 2629)
   - CuSO4 Test (IS 2633)
   - Superior High-Grade Zinc Ingot should be of 99.999% purity (IS 209)(Preferably Hindustan Zinc Limited or Equivalent).

vii. Foundation Hardware – If using foundation bolt in foundation then it should be as perIS 5624.

4. Metering

A Roof Top Solar (RTS) Photo Voltaic (PV) system shall consist of following energy meters:

i. Net meter: To record import and export units

ii. Generation meter: To keep record for total generation of the plant.

The installation of meters including CTs & PTs, wherever applicable, shall be carried out by the JPDCL as per the terms, conditions and procedures laid down by the concerned JPDCL.

5. Array Junction Boxes:

The junction boxes are to be provided in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JBs shall be such that input & output termination can be made through suitable cable glands. Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.

Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP 65 or better standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry, Single /double compression cable glands should be provided.

Polyamide glands and MC4 Connectors may also be provided. The rating of the junction box shall be suitable with adequate safety factor to interconnect the Solar PV array.

Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.

Junction boxes shall be mounted on the MMS such that they are easily accessible and are protected from direct sunlight and harsh weather.

6 DC Distribution Box (DCDB):

May not be required for small plants, if suitable arrangement is available in the inverter.

DC Distribution Box are to be provided to receive the DC output from the PV

array field.

DCDBs shall be dust & vermin proof conform having IP 65 or better protection, as per site conditions.

The bus bars are made of EC grade copper of required size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the inverter along with necessary surge arrestors. MCB shall be used for currents up to 63 Amperes, and MCCB shall be used for currents greater than 63 Amperes.

7 AC Distribution Box (ACDB):

AC Distribution Panel Board (DPB) shall control the AC power from inverter, and should have necessary surge arrestors, if required. There is interconnection from ACDB to mains at LT Bus bar while in grid tied mode.

All switches and the circuit breakers, connectors should conform to IEC 60947:2019, part I, II and III/ IS 60947 part I, II and III.

The isolators, cabling work should be undertaken as part of the project.

All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air -insulated, cubical type suitable for operation on *1-ϕ*/*3-ϕ*, 415 or 230 volts, 50 Hz (or voltage levels as per CEA/State regulations).

The panels shall be designed for minimum expected ambient temperature of 45 degrees Celsius, 80 percent humidity and dusty weather.

All indoor panels will have protection of IP 54 or better, as per site conditions. All outdoor panels will have protection of IP 65 or better, as per site conditions.

Should conform to Indian Electricity Act and CEA safety regulations (till last amendment).

All the 415 or 230 volts (or voltage levels as per CEA/State regulations) AC devices / equipment like bus support insulators, circuit breakers, SPDs, Voltage Transformers (VTs) etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions.

i. Variation in supply voltage: as per CEA/State regulations
ii. Variation in supply frequency: as per CEA/State regulations

The inverter output shall have the necessary rated AC surge arrestors, if required and MCB/ MCCB. RCCB shall be used for successful operation of the PV system, if inverter does not have required earth fault/residual current protection.

8 Protections

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

Earthing Protection

i. The earthing shall be done in accordance with latest Standards.
ii. Each array structure of the PV yard, Low Tension (LT) power system, earthing grid for switchyard, all electrical equipment, inverter, all junction boxes, etc. shall be grounded properly as per IS 3043-2018.
iii. All metal casing/ shielding of the plant shall be thoroughly grounded in accordance with CEA Safety Regulation 2010. In addition, the lightning arrester/masts should also be earthed inside the array field.
iv. Earth resistance should be as low as possible and shall never be higher than 5 ohms.
v. For 10 KW and above systems, separate three earth pits shall be provided for individual three earthing viz.: DC side earthing, AC side earthing and lightning arrestor earthing.

Lightning Protection

i. The SPV power plants shall be provided with lightning & over voltage protection, if required. The main aim in this protection shall be to reduce the overvoltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. Lightning arrestor shall not be installed on the mounting structure.
ii. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors (LAs). Lightning protection should be provided as per NFC17-102:2011/IEC 62305 standard.
iii. The protection against induced high-voltages shall be

provided by the use of Metal Oxide Varistors (MOVs)/Franklin Rod type LA/Early streamer type LA.

iv. The current carrying cable from lightning arrestor to the earth pit should have sufficient current carrying capacity according to IEC 62305. According to standard, the minimum requirement for a lightning protection system designed for class of LPS III is a 6 mm^2 copper/ 16 mm^2 aluminum or GI strip bearing size 25*3 mm thick). Separate pipe for running earth wires of Lightning Arrestor shall be used.

Surge Protection

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

9 CABLES

All cables should conform to latest edition of IEC/equivalent BIS Standards along with IEC 60227/IS 694, IEC 60502/IS 1554 standards.
Cables should be flexible and should have good resistance to heat, cold, water, oil, abrasion etc.
Armored cable should be used and overall PVC type 'A' pressure extruded insulation or XLPE insulation should be there for UV protection.
Cables should have Multi Strand, annealed high conductivity copper conductor on DC side and copper/FRLS type Aluminum conductor on AC side. For DC cabling, multi-core cables shall not be used.
Cables should have operating temperature range of -10°C to +80°C and voltage rating of 660/1000 V.
Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop less than 2% (DC Cable losses).
The size of each type of AC cable selected shall be based on minimum voltage drop. However; the maximum drop shall be limited to 2%.
The electric cables for DC systems for rated voltage of 1500 V shall conform to BIS 17293:2020.
All cable/wires are to be routed in a RPVC pipe/ GI cable tray and suitably tagged and marked with proper manner by good quality ferule

or by other means so that the cable is easily identified.
All cable trays including covers to be provided.
Thermo-plastic clamps to be used to clamp the cables and conduits, at intervals not exceeding 50 cm.
Size of neutral wire shall be equal to the size of phase wires, in a three-phase system.
The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25 years.

10 DRAWINGS & MANUALS:

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

11 Miscellaneous:

Connectivity: The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the JERC regulation for Grid connectivity and norms of JPDCL and amended from time to time.
Safety measures: Electrical safety of the installation(s) including connectivity with the grid must be taken into account and all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA Safety Regulation 2010 etc. must be followed.
Shadow analysis: The shadow analysis report with the instrument such as Solar Pathfinder or professional shadow analysis software of each site should be provided and the consumer should be educated to install the system only in shadow free space. Lower performance of the system due to shadow effect shall be liable for penalty for lower performance.
Quality Certification, Standards and Testing for Grid-Connected Rooftop Solar PVSystems/Power Plants

Solar PV Modules/Panels	
IEC 61215 and IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61701:2011	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853-1:2011 / IS 16170-1:2014	Photovoltaic (PV) module performance testing and energy rating –:Irradiance and temperature performance measurements, and power Rating.
IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH3) Corrosion Testing(as per the site condition like dairies, toilets etc)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction, Part 2: Requirements for Testing
IEC 62804	Photovoltaic (PV) modules – Test method for detection of potential-induced degradation. IEC 62804-1: Part 1: Crystalline Silicon
Solar PV Inverters	
IEC 62109 or IS : 16221	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements, and Safety of power converters foruse in photovoltaic power systems Part 2: Particular requirements for inverters. Safety compliance(Protection degree IP 65 or better for outdoor mounting, IP 54 or better for indoor mounting)
IS/IEC 61683 latest(as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)

IEC 60068-2 /IEC 62093 (as applicable)	Environmental Testing of PV System – Power Conditioners and Inverters
IEC 62116:2014/ IS16169	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
Fuses	
IS/IEC 60947 (Part 1, 2 & 3), EN 50521	General safety requirements for connectors, switches, circuit breakers(AC/DC): 1)Low-voltage Switchgear and Control-gear, Part 1: General rules 2)Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers 3) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors switch-disconnectors and fuse-combination units 4) EN 50521: Connectors for photovoltaic system-Safety requirements and tests
IEC 60269-6:2010	Low-voltage fuses - Part 6: Supplementary requirements for fuse-Links for the protection of solar photovoltaic energy systems
Solar PV Roof Mounting Structure	
IS 2062/IS 4759/AA6063 T6	Material for the structure mounting
Surge Arrestors	
BFC 17-102:2011/ NFC 102:2011/ IEC 62305	Lightening Protection Standard
IEC 60364-5-53/ IS 15086-5 (SPD) IEC 61643-11:2011	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power

	systems - requirements
	and test methods
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1& 2)/ IEC69947 (as applicable)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258),mainly for DC Cables
Earthing /Lightning	
IEC 62561/IEC 60634 Series (Chemical earthing) (as applicable)	IEC 62561-1: Lightning protection system components (LPSC) -Part:Requirements for connection components IEC 62561-2: Lightning protection system components (LPSC) –Part 2:Requirements for conductors and earth electrodes IEC 62561-7: Lightning protection system components (LPSC) -Part 7:Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	Junction boxes and solar panel terminal boxes shall be of the thermo-plastic type with IP 65 or better protection for outdoor use, and IP 54 or better protection for indoor use

Sd/-

Chief Engineer, Distribution,
Jammu Power Distribution Corporation Limited (JPDCL),
Bhagwati Nagar, Jammu
e-mail: cedistributionjpdcl@gmail.com

Annexure-B

Format of Declaration from vendor Required for Rooftop Solar Installer / Vendor for Enlistment at National Portal for Rooftop Solar		
Sl.No.	**Particulars**	**Details/Remarks**
1	Name of the Firm	
2	Legal Status of the Firm (Ltd/Pvt/Proprietary/Partnership/LLP/ MSME)	
3	GST Registration number	Copy attached(Yes/No)
4	PAN Number	PAN No.: Copy attached(Yes/No)
5	PF Registration Number, If applicable	If Applicable Copy Attached(Yes/No)
6	Electrical Contractor License, If applicable	Copy Attached(Yes/No)
7	ESI Registration Number, If applicable	If Applicable Copy Attached (Yes/No)
8	The Firm fulfils all statutory requirements, for example those relating to electrical safety, to install rooftop Solar plants.	(Yes/No)
9	The Firm will install rooftop solar plants fulfilling minimum technical standards and specifications issued By the MNRE and specifications mentioned in this Document	(Yes/No)
10	The Firm will provide comprehensive maintenance of the roof top solar plant installed by the Firm for atleast 5 years.	(Yes/No)

11	The Firm will provide all necessary information related to installation of rooftop solar plants and Do's and Don'ts to the beneficiary.	(Yes/No)
12	The Firm will also provide name, contact number and e-mail of the person where the beneficiary can register a complaint related to rooftop solar plants installed by the Firm. This detail will also be made available to the State authorities and MNRE	Copy to be attached on letter head (Yes/No)
13	In case of any discrepancy in terms of quality and services provided by the Firm, the concerned distribution company/Electricity Department can blacklist the Firm and encash the performance bank guarantee, apart from taking other legal actions.	(Yes/No)
14	The Firm has sufficient (at least three) technical manpower trained in the skills required to execute the Work of installation of roof top solar plants.	(Yes/No)
15	The signatory of this declaration is authorised by the Firm and the Firm will abide by all the conditions mentioned above. In case of any misinformation or Concealment off acts, appropriate legal action may be taken against the Firm by the affected parties.	
16	Along with this declaration, the Firm is submitting a performance bank guarantee of Rs.2.5lakh valid for five years.	As per attached copy Performance Bank Guarantee Number, Value, issuing date, Validity till which date to be entered

17	The Firm is willing to work in urban/rural areas of	Name of the JPDCL Circle 1. 2. 3. 4. 5.

Authorised Signatory

Name:
Designation:
Name of the Firm:

Annexure

Format of Declaration from vendor

1. Name of the Firm_____
2. Legal status of the Firm (Ltd/Pvt/Proprietary/Partnership/LLP/MSME) _.
3. GSTIN number of the Firm_____
4. PAN number of the Firm_____.
5. Provident Fund number of the Firm (if applicable) __
6. The Firm has sufficient technical manpower trained in the skills required to execute the work of installation of rooftop solar plants.
7. The Firm fulfils all statutory requirements, for example those relating to electrical safety, to install rooftop solar plants.
8. The Firm will install rooftop solar plants fulfilling minimum technical standards and specifications issued by the MNRE.
9. The Firm will provide comprehensive maintenance (CMC) of the rooftop solar plant installed by the Firm for at least 5 years.
10. The Firm will provide all necessary information related to installation of rooftop solar plants and Do's and Don'ts to the beneficiary
11. The Firm will also provide name, contact number and e-mail of the person where the beneficiary can register a complaint related to rooftop solar plants installed by the Firm. These details will also be made available to the State authorities and MNRE.
12. In case of any discrepancy in terms of quality and services provided by the Firm, the concerned distribution company/Electricity Department can blacklist the Firm and encash the performance bank guarantee (PBG), apart from taking other legal actions.
13. The signatory of this declaration is authorized by the Firm and the Firm will abide by all the conditions mentioned above. In case of any misinformation or concealment of facts, appropriate legal action may be taken against the Firm by the affected parties.
14. Along with this declaration, the Firm is submitting a performance bank guarantee of Rs. 2.5 lakh valid for five years.
15. The Firm is willing to work in urban/rural areas of ____, ____(name of JPDCL Circles).

Authorised Signatory Name: _____

Designation: _____

Name of the Firm: _____

ANNEXURE II

FORMAT FOR PERFORMANCE BANK GUARANTEE (PBG)

(To be on judicial stamp paper of appropriate value as per Stamp Act of UT J&K)

Ref:

Bank Guarantee No:

To,

Date:

[Insert the name and complete Address of the JPDCL Office]

In consideration of the [Insert name and address of the Bidder] (hereinafter referred to as 'Bidder') submitting the response to Expression of Interest (EOI) inter alia for selection of the Project in response to the EOI No. [Insert the EOI no.]dated [Insert the Date of issuance of EOI] issued by the [Insert the name of JPDCL Office] (hereinafter referred to as ___ and considering such response to the EOI of [insert the name of the Bidder] as per the terms and conditions of the EOI and amendments, the [insert name & address of Bank,] hereby agrees unequivocally, irrevocably and unconditionally to pay to [Insert the name of JPDCL Office] at [Insert the complete Address of JPDCL Office] forthwith on demand in writing from [Insert the name of JPDCL Office] or any Officer authorized by it in this behalf any amount upto and not exceeding Rs. 2,50,000/-(Rs. Two Lakh Fifty Thousand only), on behalf of M/s. [Insert name of the Bidder] .

This guarantee shall be valid and binding on this Bank upto Five (05) Years from date of issuance of the BG and shall not be terminable by notice or any change in the constitution of the Bank or the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs.2,50,000/-(Rs. Two Lakh Fifty Thousand only).

Our Guarantee shall remain in force until [Insert the Exact Date, completing 5 Years counting from Date of signing of BG/ and [Insert the name of JPDCL Office) shall be entitled to invoke this Guarantee till [Insert the Exact Date, completing 0n 5 Years counting from Date of signing of BG).

The Guarantor Bank hereby agrees and acknowledges that the {Insert the name of JPDCL Office) shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by [Insert the name of JPDCL Office/, made in any format, raised at the above-mentioned address of the Guarantor Bank, in order to make the said payment to [Insert the name of JPDCL Office/.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by [Insert name of the Empaneled Bidder) and/or any other person. The Guarantor Bank shall not require /Insert the name of JPDCL Office to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against /Insert the name of JPDCL Office/in respect of any payment made hereunder.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at [Insert the name of City/State/shall have exclusive jurisdiction. The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly /Insert the name of JPDCL Office/ shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against the Bidder, to make any claim against or any demand on the Bidder or to give any notice to the Bidder or to enforce any security held by [Insert the name of JPDCL Office/or to exercise, levy or enforce any distress, diligence or other process against the Bidder.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs. 2,50,000/-(Rs. Two Lakh Fifty Thousand only) and it shall remain in force until (Insert the Exact Date, completing on 5 Years counting from Date of signing of BG) with an additional claim period of thirty (30) days thereafter. We are liable to pay the guaranteed amount or any part thereof under this Bank

Guarantee only if [Insert the name of JPDCL Office] serves upon us a written claim or demand.

Signature _____ _

Name --------For
[Insert Name of the Bank]

Banker's Stamp and Full Address.
Dated this __ day of __ , 20_

(Bank Contact Details & E Mail ID is to be provide)

Witness: 1. . ..... 2. .....
Signature Name and Address Signature Name and Address

Letter of Authorisation

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

Chief Engineer, Distribution,
Bhagwati Nagar, JPDCL,
Jammu

Subject : Expression of Interest for Site Survey, Design, Supply, Installation and Commissioning including Warranty, Comprehensive Maintenance Contract(CMC) for Five(05)years of Grid-Connected Solar Photovoltaic Power Plants of different capacities launched by MNRE GoI Under Pradhan Mantri Surya Ghar: Muft Bijli Yojana in respect of Domestic Consumers of JPDCL UT of J&K.

Ref no: CEJ/TS-II/EOI/1355 dt: 25.06.2024

Sir,

I/we hereby authorize Ms/ Mr. _____-- , Designation_____ of our company to sign all relevant documents on behalf of the company / firm in dealing with the above EOI.

She / He is also authorized to attend all meetings and submit technical and commercial information as may be required by JPDCL in the course of the EOI.

1. _____
2. _____

Signature attested

Name and designation of the attesting officer with stamp.

Your faithfully,

Head of the Organisation
Name of the Organisation.

Format for Work Experience
Details of Orders received and executed

Details of Orders Received and Executed by the firm for S/I/T/C of SPPs to different State Nodal Agencies Govt. Under takings / Govt. Institutions.

S. No.	Capacity of RTSPV System installed	Name of the Purchaser	Supply order No. / date	Date of installation & Commissioning	Location of installed SPP

Yours faithfully,

(Signature of the Authorised Signatory)

Name:
Designation:
Company Seal:

Note:

a) Attach photocopies of Purchase Orders.
b) Separate sheet may be used for giving detailed information in seriatim duly signed. This EOI proforma must be submitted duly signed in case separate sheet is submitted
c) EOI vendor must produce proof of satisfactory completion against the indicated work / supply orders from the beneficiary organizations.