RAJASTHAN ELECTRONICS & INSTRUMENTS LIMITED, JAIPUR

(An ISO 9001 : 2015& 14001 : 2015 "Mini Ratna" Central Public Sector Enterprise)

2, KANAKPURA INDUSTRIAL AREA, SIRSI ROAD,

JAIPUR-302034

Tel No: 0141- 2470879 / 0141 - 2470908

website: www.reiljp.com

NIT for "Rate Contract for Survey, Design, Supply (except SPV Module), Erection, Testing, Commissioning and Comprehensive Operation and Maintenance for 5 years Grid Connected Rooftop Solar Photovoltaic Power Projects on various Government buildings in Southern Region (SR) in India"

TENDER NO.REIL/RE/2025-26/006 Dated 06.06.2025

Important Notes:

1.	TENDER FEE	RS. 1,000/- (Rupee One Thousand Only) through Demand Draft / RTGS
2.	ESTIMATED TENDER VALUE	RS. 250 LAKH ONLY
3.	EARNEST MONEY DEPOSIT (EMD)	RS. 5,00,000/- (2% OF ESTIMATED VALUE IN FORM OF DEMAND DRAFT/BANK GUARANTEE/RTGS)
4.	LAST DATE OF ONLINE TENDER SUBMISSION	27.06.2025 upto17:00 HRS
5.	TECHNICAL BIDS OPENING DATE	28.06.2025 upto17:00 HRS
6.	OFFER VALIDITY	90 Days from the last date of tender submission
7.	Pre Bid Meeting Online)	**Monday 16 June 15:00–16:00 HRS** **Link shall be uploaded on portal**
8.	CONTACT PERSON(S) FOR TECHNICAL QUERIES	1. Sh. Bheem Singh, Manager (RE), Email : bs.meena@reil.co.in , Contact : +91-7727011737 2. Sh. Deepak Gupta, AGM (RE), Email : deepak.gupta@reil.co.in Contact : +91-7727011714
7.	CONTACT PERSON(S) FOR TENDER QUERIES & SUBMISSION OF HARD COPY OF TENDER FEE & EMD	1. Sh. Mukesh Gupta Sr. Engineer (MM), Email : mukesh.gupta@reil.co.in , Contact : +91-8387814090 2. Sh. Arun Kumar Dwivedi, AGM (MM), Email : arun.dwivedi@reil.co.in Contact : +91-7727011725

Kindly note that only online bid will be considered against this tender

Bidders Details

Information Details	Primary Contract	Secondary Contract
Name		
Designation		
Company Name		
Company Address		
Phone No.		
Mobile No.		
Email		
Website		

RAJASTHAN ELECTRONICS & INSTRUMENTS LIMITED, JAIPUR

NOTICE INVITING TENDER NO. REIL/RE/2025-26/006

This is a Notice Inviting Tender (NIT) for**"Rate Contract for Survey, Design, Supply (except SPV Module), Erection, Testing, Commissioning and Comprehensive Operation and Maintenance for 5 years Grid Connected Rooftop Solar Photovoltaic Power Projects on various Government buildings in Southern Region (SR) in India"**as per description and terms & conditions specified hereinafter:

Item Description:

S. No.	Description	Total Rate Contract Cumulative Capacity of this NIT
1.	Rate Contract for Survey, Design, Supply (except SPV Module), Erection, Testing, Commissioning and Comprehensive Operation and Maintenance for 5 years Grid Connected Rooftop Solar Photovoltaic Power Projects on various Government buildings in **Southern Region (SR)** in India. (Southern Region - Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana and Lakshadweep and Puducherry)	1000 kWp

Note:

1. This rate contract shall be valid for a period of One Year. It may be extended further as per requirement.
2. Bidder has to submit EMD. EMD shall be 2% of estimated rate.
3. Techno-commercial eligibility shall be checked.
4. Individual work orders shall be allocated to successful bidders, after received of work order from end customer to REIL. Site Survey shall be carried out by successful bidder for submission of feasibility report before issue of work order.
5. The SPV Power Plant capacity on one building shall be in the range of 10 kWp to 1000 kWp.
6. Work shall be splited to L-1 & L-2 in the ratio of 70% & 30% at L-1 rate. REIL is authorized to allocate final capacity as per end customer requirements.
7. The per kWp unit rate shall be quoted by bidder in price bid. The unit rate be considered as per followings during evaluation:

S. No.	Description	% of Price quoted	% GST applicable
1	Supply of all equipment	70%	12%
2	I&C of all equipment	20%	18%
3	5 years O&M	10%	18%

E-Tendering Procedure: The work shall be carried out through submission of online tenders only. No offer in physical form will be accepted and any such offer if received by REIL will be out rightly rejected. Tender documents can be downloaded from our website www.reiljp.com or website of CPPP

www.eprocure.gov.in.Final bids are to be submitted on website www.eprocure.gov.in.Any changes modification in the tender enquiry will be intimated through above websites only. Bidder are therefore, requested to visit our website regularly to keep themselves updated.

The bidder should have a valid Digital Signature certificate issued by any of the valid certifying Authorities to participate in the online tender.

The bids shall be uploaded in electronic form only through e-tendering system on website www.eprocure.gov.in.

Note: e- Procurement system does not allow submission of documents after due date oftender. Incomplete form or non-submission of documents to verify details may results into rejection of your offer and no communication shall be done for submission of documents.

Price Bid:-Price Bid format given with tender is to be uploaded after filling all relevant information like basic prices, taxes & duties. The Price bid should be uploaded strictly as per the format available with the tender failing which the offer is liable for rejection (blank or changing format of price sheet will not be accepted by system). **REIL reserve the right to distribute the work.**

The bid shall comprise of technical bid and commercial Bid. The detailed scope of work, terms and conditions etc. are available with the Bid documents.

REIL reserves the right to reject the whole or part of any or all bids received, without assigning any reason**.**

Electronic Reverse Auction-Electronic Reverse Auction is a type of auction where the starting price, bid decrement, duration of action, maximum number of automatic extensions are announced before start of online reverse auction. RA shall be done in tenders with a special condition that H1 Bidder eliminated from RA and balance bidders be eligible for RA starting from the lowest established rate in financial opening.

Addl. General Manager (MM)

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Annexure – I

RAJASTHAN ELECTRONICS & INSTRUMENTS LIMITED, JAIPUR

Process Compliance Form

(Tenders are required to print on their company's letter head and signed, stamp before uploading).

To

Addl. General Manager (MM)
M/s Rajasthan Electronics & Instruments Limited
2, Kanakpura Industrial Area, Sirsi Road,
Jaipur-302034

Sub:- Acceptance to the process related Terms and Conditions for the e-Tendering

Dear Sir,

This has reference to the Terms & Conditions for e-Tendering mentioned in the TenderNo.:- REIL/RE/2025-26/006 Dated 06.06.2025.

We herebyconfirm the following:-

1) The undersigned is authorized representative of the company.
2) We have carefully gone through the NIT, Tender Documents and the Rules governing the e-tendering as well as this document.
3) We will honor the Bid submitted by us during the e-tendering.
4) We undertake that if any mistake occurs while submitting the bid from our side, we will honor the same.
5) We are aware that if REIL has to carry out e-tender again due to our mistake, REIL has the right to disqualify us for this tender.
6) We confirm that REIL shall not be liable & responsible in any manner whatsoever for my/our failure to access & submit offer on the e-tendering site due to loss of internet connectivity, electricity failure, virus attack problem with the PC, digital signature certificate or any other unforeseen circumstances etc.

With regards

Signature with company seal

Name:
Designation:
E-mail Id

Annexure - II

INSTRUCTION TO BIDDERS

1. The Bid forms containing the Terms and Conditions, the tender and the Schedule of contract, **should be submitted online** failing which the tender shall be liable for rejection. In the event of the space on the Schedule of contract / specifications of items/proforma being insufficient for the required purpose, additional pages may be added. Each such additional page must be numbered consecutively, bearing the Tender Number and be duly signed and stamped by the bidder. In such cases, reference to the additional pages must be made in the Tender Form. If any modification of the schedule is considered necessary, you should communicate the same by means of separate letter sent along with the Tender.

2. PROCEDURE FOR SUBMISSION OF TENDERS / BIDS:

The tender should be submitted in **"TWO BID" SYSTEM:**

PART -1 TECHNICAL BID:

Technical Bid along with tender documents (duly signed on each page) to be uploaded in the e-procurement portal. Technical Bid to be opened by the REIL committee. Board resolution/ Authorization letter for signing of the bid document from the bidder be submitted. Prices / Costs of the items should not be indicated anywhere in the Technical Bid. This should be followed meticulously failing which the bid is liable to be rejected.

All eligibility documents should be submitted with the technical bid.

PART -2 FINANCIAL BID:

Price Bid BOQ given with tender is to be uploaded strictly as per the format available with the tender failing which the offer is liable for rejection (renaming or changing format of BOQ sheet will not be accepted by the system).

Note: e-Procurement system does not allow submission of documents after due date of tender. Incomplete form or non-submission of required documents may results into rejection of your offer and no Communication shall be done for submission of documents.

1. OPENING OF TENDER:

The **Price/Financial bids** of the bidders whose technical bids are found technically suitable only will be opened later. **The decision of the evaluation committee on technical suitability shall be final and binding.**

2. PRICES:

i. Prices/Financial bid are to be in BOQ format in Indian Rupees and must be meaningful and measurable in the context.

ii. Bidders should clearly specify whether prices quoted are inclusive of GST/duties/ statutory charges or such charges as extra. Where no specific mention GST or other duties quoted shall be **deemed to be inclusive of such taxes** / charges.

iii. Price must be quoted in original sheet of BOQ failing which the same is liable to be rejected.

iv. Evaluation will be done on total price (w/o GST) quote by bidder's zone wise.

v. REIL has reserve to right for negotiation with L1 bidder.

3. OFFER VALIDITY:

Validity of offer shall be 90 days from tender opening date.

4. EMD:

Interested bidder shall submit Earnest Money (EMD). The EMD amount shall be deposited in form of Demand Draft/RTGS/Bank Guarantee to REIL. EMD should be valid for a period of 45 days beyond the bid validity period (i.e 135 days from last date of submission of bid). The bid shall be treated as non responsive in case of non submission of EMD amount. No interest shall paid towards EMD amount.

EMD shall be forfeited without prejudice to the bidder being liable for any further consequential loss or damage incurred to REIL under following circumstances:-

100% of EMD amount, if a Bidder withdraws/revokes or cancels or unilaterally varies his bid in any manner.EMD shall be returned to un-successful bidders within 45 days

Note: MSE (Micro & Small Enterprises) shall be exempted from payment of Tender Document Fee & EMD. It is mandatory for MSE bidders to declare their UDHYOG AADHAR NUMBER on CPP Portal, failing which such bidders will not able to enjoy the benefits of procurement policy for MSE and also attach the relevant certificate with their bid submission.

5. OTHERS -

i. Bidder has to submit per kW rates.

ii. The tender fee and Bid Security as detailed under to be deposited in REIL office in hard copy as per the Bid timeline given in the Bid Information Sheet.

SITE DETAILS, ESTIMATED RATES & EMD REQUIREMENTS

S. No.	Zone Name	State / UT	Total Rate Contract Capacity (in kWp) AC Capacity	Maximum Ceiling Limit in Rs. (per kWp)excluding GST	Estimated Rate (in Rs.) excluding GST	EMD (in Rs.)
1.	Southern Zone	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana and Lakshadweep and Puducherry	1000	25000	2,50,00,000/-	5,00,000/-

Note: Maximum ceiling limit has been defined for the zone. These values are including O&M for 5 years butwithout GST. Any bid price received higher than mentioned ceiling limit, shall be out rightly rejected.

Annexure - III

ELIGIBILITY CRITERIA (ZONE WISE):

A) TECHNICAL ELIGIBILITY CONDITIONS:

Bidder must fulfill following criteria:-

1. The Bidder should be a Company / Firm / Corporation,incorporated in India under the Companies Act, 1956 or 2013 and having experience in Design, Supply, and Installation& Commissioning of Grid Connected Solar Power Plants.

   OR

   A Limited Liability Partnership Firm (LLP) registered under section 12 of Limited Liability Partnership Act, 2008and having experience in Design, Supply, and Installation & Commissioning of Grid Connected Solar Power Plants.

2. Experience of having successfully completed similar works **(Design, Supply, Installation & Commissioning of Grid Connected Solar Power Plants in Govt. Buildings / Govt. Projects)**, during last 7 years ending last day of month previous to the one in which applications are invited should be either of the following:

   a) Three similar completed works costing not less than the amount equal to 40% of the estimated cost.

   OR

   b) Two similar completed works costing not less than the amount equal to 50% of the estimated cost.

   OR

   c) One similar completed work costing not less than the amount equal to 80% of the estimated cost.

3. Out of above, bidder has to submit satisfactorily O&M report of minimum one year for at leastone completed work.

B) FINANCIAL ELIGIBILITY CONDITIONS:-

1. Average Annual Financial Turnover during the last 3 years, ending 31st March of the previous financial year (2023-24), should be at least 30% of the estimated cost. Turnover of 3 years (2021-22, 2022-23 & 2023-24) is required duly certified by CA along with balance sheets.

2. The bidder should have positive net worth as on 31.03.2024. Net worth certificate is required duly certified by CA.

3. The bidder should have adequate financial resources or should have sufficient resources audited financial statement to undertake the contract. Below mentioned documents are required:

   Letter from a Financial Institution that it is willing to fund the project (estimated project cost to be mentioned in letter).

   OR

Declaration on bidder's letter head (in case the bidder wish to use the internal resources for funds / shall be furnished). Estimated project cost to be mentioned in letter.

4. The bid shall be not considered for bidders, who are having prior contract terminations due to non-performance or litigation history against government entities. Annexure-IX is required from bidder duly notarized.

Bidder should submit following documents along with Technical bid:-

1. Company Incorporation Certificate / Company Registration Certificate.
2. Balance sheet & ITR for last three yearsi.e. 2021-22, 2022-23 & 2023-24.
3. Turnover of last 3 years and Networth value duly certified by CA.
4. Past Experience details as per technical eligibility asked in the NIT. Kindly attach verified documents from customer such as Work Orders,Completion Certificates and O&M Certificate. The experience documents should beduly notarized.
5. Photocopy of GST Registration no. & PAN no.
6. Any other relevant documents
7. All required annexure's in tender

OTHER CONDITIONS:

a) **Responsibility for executing Contract**: The contractor is to be entirely responsible for theexecution of the contract in all respects in accordance with the terms and conditions as specified in the acceptance of tender.

b) The contractor shall not sublet transfer or assign the contract to any part thereof withoutthe Written permission of the Addl. General Manager (MM). In the event of the contractorcontravening this condition, Addl. General Manager (MM) be entitled to place the contract elsewhere on the contractors account at his risk and the contractor shall be liable for any lossor damage, which the Addl. General Manager (MM), may sustain in consequence or arising outof such replacing of the contract.

c) **Document**: The bidder should have a valid **PAN / TAN /GST NO&other statutorydocument as applicable** and produce attested copies of such certificates along with the tender papers in Technical Bid,failing which the tender is liable to be rejected. Check list be attached.

d) **Right to accept / reject**: REIL reserves the right to reject any or all tender without assigning any reason whatsoever. Also, the REIL authority reserves the right to **award** any or part or full contract to any successful agency at its discretion and this will be binding on the bidder.

e) The capacity of SPV Power Plant shown in the tender can be increased or decreased to any extentdepending upon the actual requirement.

f) **Assistance to contractor**: The contractor shall not be entitled for assistance either, in the procurement of raw materials required for the fulfillment of the contract or in the securing of transport facilities.

ElectricalContractorLicense

- The workshall be carried out by the contractor, having valid ElectricalContractorLicenseforcarryingoutinstallationworkunder thedirectsupervisionof thepersonsholdingvalidcertificatesof competencyissuedbytheStateGovernment. The same shall be submitted to REIL by successful bidder after placement of work order.
- Thesuccessful biddershallfurnish thenamesandparticulars of the certificate of competency of supervisor andworkmen to be engagedforcarryingoutthiswork.

Annexure – III A

DETAILED SCOPE OF WORK OF BIDDER

Annexure-A Particulars	Description
Brief Scope of Work	Design, engineering, manufacture, testing at manufacture's work, supply including transportation & insurance, unloading, storage, erection, testing and commissioning of following equipment and items complete in all respect: 1. Grid Connected Rooftop Solar PV Power Plant including all associated equipment & facilities as per technical specification. Power Control Centre (PCC) for Integration of Solar PV Power Plant with utility Grid shall be the existing AC Distribution Board available near to the roof top of the building. For above said integration of Rooftop Solar (RTS) system, the scope of works shall be considered limited up to the ground floor level of the building. 2. Three Phase Net-Meter / Reverse Power flow scheme / Zero export controller as per the State Utility policy for Grid Connectivity of Rooftop Solar PV Power Plant. In case, reverse power flow blocking scheme / Zero Export controller is required (instead of Net-meter) as per the State utility policy, same shall be provided by the contractor in lieu of the Net-meter without any price implication. 3. Metallic ladder for access to rooftop including associated civil & earthing works. 4. Comprehensive Maintenance Contract (CAMC) for five (05) years from the date of commissioning or start of net-metering, whichever is later. 5. For cleaning / washing of the rooftop solar system, water supply at a single point near to the building shall be made available to the contractor. All further distribution for the same shall be made by the Contractor suiting to the site conditions. 6. Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the roof top solar system are deemed to be included in the scope of the specification unless specifically excluded.
PHYSICAL AND OTHER PARAMETERS	a) Seismic Zone : As per IS 1893 b) Wind Zone : As per National Building Code (NBC) 2016 c) Coastal Area Consideration : YES for buildings located within 60km from the sea-shore, otherwise NO
Technology	SPV Modules shall be provided by REIL at site (min. 500 Wp). Inverters are to be purchased from Class-I localsupplier only by Contractor&**local Content shall be min 50%.**
O&M Period	5 Years from the date of Completion of Facilities. The Contractor shall

	provide comprehensive Maintenance (CAMC) of the plants for a period of 05 years from the date of commissioning or start of net metering whichever is later. During the maintenance period, the Contractor shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of all defective equipment including Inverters etc., deployment of staff for maintenance, complaint logging & its attending.
Estimate life of solar PV plant	25 Years
Location/Site Details	
Location(s)	Govt. Buildings in Southern Zone in India
Electrical Interconnection Details	
Evacuation Voltage	As per State solar policy/SERC/Discom
Power for Construction	Construction power will be provided at one point of each location. Necessary arrangement including cabling, metering, etc. to draw power at required locations shall be done by bidder within the quoted price. The energy consumed shall be chargeable as per discom rates.
Water	Water shall be provided free of cost for construction and periodical cleaning of modules at one point of each location. Additional connection points may also be allowed subject to feasibility. However necessary arrangement including pipe laying, pumping, metering, etc. to draw water at required locations shall be done by bidder within the quoted price.
Access to Roofs	Bidder has to make permanent MS ladders at buildings wherever access to the Rooftops is not available
Performance Parameters / Guarantees	
Minimum CUF	As per tender requirement.
Minimum values of PR	75%.
GHI Values	Shall be as per PV Syst Software 7.4.5 version or latest version using Meteonorm 8.1 data.
Special conditions	The capacity at a location shall be arrived based on preliminary assessment of data received from customers and shall be allocated to the vendor as per the allocation strategy stated in the bidding documents. However, if the capacity range changes during detailed engineering, then also same rate for the allocated capacity range shall be applicable.
	Premise/location wise Commissioning of rooftop solar with net metering/ net billing/behind the meter is allowed.
	The O&M rates shall be minimum 10% of total cost.
	The quoted price per kW in tender shall be considered for the Rooftop Solar (RTS) system of capacity range upto 10 kW. For the RTS system of capacity above 10 kW and upto 50 kW, the price shall be considered 0.9 times the quoted price. Further, for the RTS system of capacity above 50 kW, the price shall be considered 0.85 times the quoted price.
	The quoted price per kW shall be considered for the Rooftop Solar (RTS) system to be installed on a single building. For example, if RTS system is to be installed on several buildings of a single premises, each building shall be considered separately for installation/capacity etc. of the RTS

	system.
	The contractor shall inspect and examine the site & its surroundings and should satisfy himself as to the nature of the roof, the quantities and nature of work, materials necessary for completion of the work and their availability, means of access to site and in general shall himself obtain all necessary information as to risks, contingencies, and other circumstances. The contractor shall finalize the SLD, Layout of the Roof Top Solar and prepare other necessary drawings / documents, as required, for submission to the DISCOM.
	The Contractor shall provide the metering arrangement as specified in the technical specification and shall assist the building owner for signing the Net Metering Agreement (as per MNRE/State/DISCOM Guidelines) with DISCOM
	Any fee related to registration of RTS project / NOC / net metering from the state departments etc., as applicable, shall be borne by the Contractor.
	All materials, manpower, scaffolding materials, machinery, tools, and tackles, transportation & loading/unloading, packaging and unpackaging, safe storage, watch and ward, etc. all inclusive, shall be arranged by the Contractor within the quoted price. Scope shall include all type of transportation of materials inside the working site and manpower etc. required to execute and complete the work. Underground cabling work, if required for grid connectivity of the RTS system, shall also be included in the scope of works of the Contractor
	Remote Metering Facility to be provided as per Technical Specifications.
	Contractor shall take Fire and peril insurance policy from the reputed/nationalized agency covering the risk of damage, theft of material/ equipment/ properties after completion of the work(s) throughout the O&M period **on replacement cost basis.**
	Contractor shall take third party liability insurance for deployed workmen, employees against any damage, loss, injury or death arising out of the O&M work. The insurance shall be for the replacement value of the project to ensure guaranteed minimum generation.
	Contractor shall take following insurances: 1. Transit insurance till delivery of material at site 2. Work man compensation policy during installation of systems 3. Contractor All Risk Insurance Policy during installation of systems 4. Any other insurance policy required by end customer 5. Liquidation, Death, Bankruptcy etc., shall be the responsibility of Bidder.
Mandatory Spares	The required mandatory spares shall be provided by contractor at site. The bidder is clarified that no mandatory spares shall be used during the commissioning of the equipment. Any spares required for commissioning purpose shall be arranged by the Contractor. The unutilized spares if any

	brought for commissioning purpose shall be taken back by the contractor. Wherever spares in Technical Specification has been specified as "each type/each rating/each type & rating": If the offered spare/spares are sufficient to replace the respective main equipment of all types/ratings, then such offered spare/spares shall be acceptable. It implies that common spare/spare set fulfilling the spare requirement of all types/ratings shall also be acceptable, provided it is configurable at site itself without special assistance of OEM. Mandatory Spares, wherever mentioned, are envisaged for the equipment/items being supplied under the main equipment heads under present scope meeting the requirements of Technical Specifications. The component/sub-component of an equipment/item Mandatory Spare, which is not applicable as per the offered design of respective main equipment, shall not be referred to.
BGs to be submitted by bidder	1. **During construction period:** Contract performance bank guarantee for 3% of the allocated EPC contract amount (without O&M). 2. **During O&M period:** • O&M performance guarantee for 3% of the O&M amount of allocated EPC contract. 20% of it shall be released every year.

SCHEDULE "A"

SCOPE OF WORK

Grid Connected Rooftop Solar PV Power Plant shall be provided over the rooftop area of identified building(s). This installation shall be a supplement source to substation AC distribution board/Main Switch Board bus to save on conventional energy supply from the grid during solar energy generation from the plant.

The system design and equipment shall conforming all respects to high standard of engineering, design & work man ship and shall be capable of performing continuous operation in a manner acceptable to the Employer.

The scope of work shall include, but not limited to, the equipment, materials, supply and services as mentioned below:

1. Site Visit, Identification of rooftop area& Solar potential assessment for the mentioned site(s), Obtaining No Objection Certificate (NOC) from the Electricity Distribution Company (DISCOM) for grid connectivity of rooftop Solar PV Power Plant, if required.
2. Grid Connected Rooftop Solar (RTS) PV Power Plant covering, but not limited to, the following:
    a. Inverter/ Power Conditioning Units (PCU)

b. Module Mounting Structure(MMS) and associated civil works
c. Meters
d. Array junction box
e. DC Distribution Box (DCDB),if required
f. AC Distribution Box
g. Integration of Solar PV Power Plant with Grid/PCC
h. Cable & associated accessories
i. Protection Systems– Earthing, Lightning, Surge
j. Civil works for PV Array Structures/Panels etc.
k. Data logging/ Plant monitoring
l. Danger boards &signage's
m. Cleaning system for Solar PV Modules
n. Miscellaneous
o. Portable Flood Light Panel along with associated lighting fixture (2nos.of fixture type: FL-2).

3. Comprehensive Maintenance Contract (CMC) for five (05) years from the date of commissioning of the plant or start of net-metering, whichever is later.

All civil works associated with the installation & commissioning of the Grid Connected Rooftop Solar PV Power Plant, including necessary structural works, shall be done by the Contractor. The Contractor shall specify and submit detailed General Arrangement (GA) drawing indicating various components of Solar PV Power Plant. Employer reserves the right to modify the landscaping design, layout and specification of sub-systems and components at any stage as per local site conditions/requirements.

The Employer shall provide the identified rooftop area for Solar PV power plant installation.

Access to the rooftop for installation and Operation & Maintenance (O&M) shall be provided by the Contractor through fixed/movable type metallic ladder (of 3 mtr vertical height) including associated civil & earthing works.

Annexure – III B

Technical Specifications of equipments

Power Conditioning Unit (PCU)/Inverter

1. The combined wattage of all inverters should not be less than the rated capacity of power plant under STC.
2. The estimated life of the Rooftop solar PV system shall be 25 years. The DC/AC ratio of the rooftop solar system shall be such that the module capacity shall not be greater than 20% of the inverter capacity.
3. The inverter should be purchased from class I Local supplier and must comply with the Quality Control Order dated 30.08.2017 for Solar Photovoltaic Inverters and its amendments thereof.
4. Inverter/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.
5. Maximum Power Point Tracker (MPPT) shall be integrated in the inverter/PCU to maximize energy drawn from the array. Environmental testing of MPPT units should qualify IEC 60068- 2(1,2,14,30)/Equivalent BIS.
6. The inverters /PCUs shall be IEC61000 compliant for electromagnetic compatibility, harmonics, Surge, etc.
7. The PCU/invertershallhaveanoverloadingcapacityofminimum20%.
8. The output power factor of inverter should be suitable for all voltage ranges or sink of reactive power. Inverters should have internal protection arrangements against any sustained fault in the feeder line and against the lightning on feeder.
9. TheInvertersshouldcontainthefollowingclearandindelibleMarkingLabel&WarningLabelas per IS 16221 Part II:

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 three-month time period.
iv) Input voltage, type of voltage (D.C. or A.C.), frequency, and maximum continuous current for each input.
v) Output voltage, type of voltage (D.C. or A.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.

10. Suitable marking shall be located adjacent to each fuse or 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.

11. In case the building ishavinga3-ϕconnection,3-ϕinvertershall be provided as per the requirements and regulations of the State, without any additional cost to the Employer.

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

13. The Inverter should have a provision of remote monitoring of inverter data through sim card. Recurring charges of SIM card for the contract period shall be borne by the Contractor. Required website/mobile app platform, where the Employer can access the data, should be provided/explained to the Employer. Inverter should also have provision to feed the data to the remote monitoring server totheEmployer'sportal usingrelevantAPI/protocols.Alltheinverterdatashouldbeavailablefor monitoringbywebaccess.Chargesforinternetandwebsite/mobileappplatformshallbeborneby the Contractor throughout the contract period.

14. PCUfrontpanelshallbeprovidedwithdisplay(LCDorequivalent)tomonitorthefollowing:
1. DC power input
2. DC input voltage
3. DC current
4. AC output power
5. AC voltage (all the 3 phases)
6. AC current (all the 3 phases)

15. Protection required in Inverter (minimum):
1. Input side disconnection switch.
2. Earth leakage/Ground fault monitoring.
3. DC reverse polarity protection.
4. DC over voltage/current limitation protection.
5. AC short circuit / Earth fault protection.
6. AC over voltage/current limitation protection.
7. DC and AC side surge protection (MOV) in-built.

16. **Anti-islanding protection:** PCU shall have arrangements for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.
17. The PCU shall be able to withstand an unbalanced load conforming to IEC standard and relevant electricitycondition.ThePCUshallincludeappropriateself-protectiveandself-diagnosticfeatures to protect itself and the PV array from damage in the event of PCU component failure or from parameters –beyond the PCU's safe operating range due to internal or external causes.

18. PCU shall go to shutdown/standby mode, with its contacts open, under the following

conditions before attempting an automatic restart after an appropriate time delay.

19. When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode.
20. The PCU control shall prevent excessive cycling of shut down during insufficient solar irradiance.
21. Typical technical features of the inverter/PCU shall be as follows:

PCU/Inverter AC rating	As per capacity of PV Plant	
Switching devices	IGBT/MOSFET	
Control	Microprocessor/DSP	
Nominal AC output voltage and Frequency	As per CEA / State regulations	
Output frequency	50Hz	
Grid Frequency Synchronization Range	As per CEA/State Regulations	
Ambient temperature considered	-20ºCto60ºC	
Humidity	95%Non-condensing	
Protection of Enclosure	IP-54(Minimum) for indoor.	
	IP-65(Minimum) for outdoor.	
Grid Voltage tolerance	As per CEA/State Regulations	
No-load losses	Lessthan1%ofratedpower	
Inverter efficiency (minimum)	Rated Output Power(kW)	Minimum Overall Efficiency
	1kW	92%
	Above1kWto3kW	93%
	Above3kWto5kW	95%
	Above5kWto10kW	96%
	Above10kWto20kW	97%
	Above20kW	98%
THD	<3%	
PF(minimum)	0.9(lag)-1-0.9(lead)	
Warranty	PCU/ inverter shall have a minimum comprehensive warranty of 10 years.	
DC injection limit	Should not inject DC power more than 0.5% of full rated output at the interconnection point andcomplytoIEEE519.	

Module Mounting Structure (MMS) and Associated Civil Works

1. The contractor shall take care of the load bearing capacity of roof.
2. Module mounting structures can be made from three types of materials viz. Hot Dip Galvanized Iron, Aluminum and Hot Dip Galvanized Mild Steel (MS). MS will be preferred for raised structure.
3. MMSsteelshallbeasperlatestIS2062:2011andgalvanizationofthemountingstructureshallbe in compliance of latest IS 4759.
4. MMS of Aluminum shall be as per AA6063T6. For Aluminum structures, necessary protection towards rusting needs to be provided either by coating or an iodization.
5. 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.
6. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame and associated fasteners, nuts & bolts.
7. The upper edge of the module must be covered with windshield so as to avoid building air ingress below the module. Slight clearance must be provided on both edges (upper & lower) to allow air for cooling.
8. Suitable fastening arrangements such as grouting and calming should be provided to secure the installation against the specific wind speed.
9. 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.
10. 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.
11. The structure shall be designed to withstand operating environmental conditions for a period of a minimum of 25 years.
12. The Mounting structure shall generally be designed to withstand the wind speed as per IS875 Part3 having factor of safety minimum 1.5 and wind speed of 180km/hour or cyclonic winds for coastal area. Further structures in coastal areas shall be painted with marine paint.
13. Aluminum frames should be avoided for installations in coastal areas.
14. No welding is allowed on the mounting structure.
15. The Contractor shall be responsible for the waterproofing of the roof disturbed/ pierced during installation and maintenance period. The Contractor should immediately take the necessary action to repair any damage to the waterproofing of the rooftop.
16. The Rooftop Structures may be classified in following broad categories:

a. Ballast Structure