4. Application

These General Conditions shall apply to the extent that they are not superseded by provisions in other parts of the contract.

5. Standards

The design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/ Indian Standards and as detailed in the Technical specifications Section as per the MNRE requirements of the bid document and Annexure A. The goods supplied under this contract shall confirm to the Standards mentioned, where appropriate Standards and Codes are not available, other suitable standards and codes as approved by the authoritative Indian Standards shall be used.

6. Inspection:

- The projects will be inspected by the college for quality at any time during commissioning or after the completion of the project by College
- Bidder shall inform College in writing when any portion of the work is ready for inspection (site wise) giving sufficient notice to enable College to depute officials to inspect the same without affecting the further progress of the work. The work shall not be considered in accordance with the terms of the contract until the competent person from College certifies in writing to that effect.
- The cost of Inspection shall be borne by Bidder only.
- Bidder shall carry RFID tag reader for verification of panel details, kit for testing earthing, meter for measuring structure's angle, multimeter etc.

- Bidder has to strictly follow the specifications given in the work order while carrying out the execution of work. During inspection if it is found that Bidder has deviated from the specifications, Bidder has to do the alteration / modification / reconstructions as per the given specifications at his own cost & risk.

7. **Transportation**

Where the Contractor/Agency is required under the contract to transport the goods to specified locations defined as Project sites, transport to such places including insurance, as shall be specified in the contract, shall be arranged by the Contractor / Agency, and the contract price shall include transportation costs.

8. **Assignment**

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

9. **Sub-contracts: Subcontract is strictly prohibited.**

10. **Termination for Default**

College without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor/ Agency, terminate the contract in whole or part:

- If the Contractor / Agency fails to deliver any or all the goods within the period(s) or within any extension thereof granted by the College or
- If the Contractor / Agency, in the judgment of College has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

- In the event College terminates the contract in whole or in part, College may procure, upon such terms and in such manner as it deems. Appropriate goods or services similar to those undelivered and the Contractor / Agency shall be liable to College for any excess costs for such similar goods or services. However, the Contractor / Agency shall continue the performance of the contract to the extent not terminated.

11. Applicable Law

The contract shall be interpreted in accordance with the laws of the Union of India.

12. Notices

Any notice given by one party to the other pursuant to this contract shall be sent to other party in writing or by cable, telex or facsimile and confirmed in writing to the other party's address specified. A notice shall be effective when delivered or on the notice's effective date, whichever is later.

13. Packing

- The Bidder shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the contract.
- The packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures during transit and open storage.
- Packing case size and weights shall take into consideration, where appropriate, the remoteness of the good’s final destination and the absence of heavy handlings facilities at all points in transit.

- The packing, marking and documentation within and outside the item shall comply strictly with such special requirements as shall be provided for in the contract including additional requirements, if any and in any subsequent instructions ordered by the College.

14. Danger plates:

The bidder shall provide at least 8 Danger Notice Plates at each project site of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enamelled white on both sides and with inscription in signal red colour on front side as required. The inscription shall be in English and local language.

15. Insurance:

- The Bidder shall be responsible and take an Insurance Policy for transit-cum- storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period, if required.

- The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/ material/ equipment / properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the

responsibility of bidder.

- The bidder shall provide insurance coverage ex-factory until commissioning and acceptance for replacement or repair of any part of the consignment due to damage or loss.
- The bidder shall provide insurance coverage of Complete Project documents effective from date of commissioning of the project for period of 05 years covering damage by natural calamities, fire, forceful majeure, theft, etc.

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16. Warranties and Guarantees:

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

Undertaking

(On Rs.100/- Stamp Paper)

I_____, Age-____, Years, Occupation -____-_____, Address....., the (authorized signatory) Of M/s .....(Company) hereby state that, I/my company is intending to participate for tender no. TENDER NO_____/gnkc/RUSA/2020-21 Design, Fabrication, Supply, Installation, Testing, Commissioning and Maintenance of 150 KW distributed on Grid connected solar PV plant under roof top net metering with 5 years of Comprehensive maintenance including automated cleaning system and RMS monitoring system along with insurance of project for 5 years at Guru Nanak Khalsa College of Arts, Science and Commerce (Autonomous), Nathalal Parekh Marg, Matunga, Mumbai – 400 019. I have read all the terms & conditions mentioned in the Tender document of the College. I hereby further undertake and declare that all the terms & conditions mentioned in each and every page of the said tender document along with the clarifications released, if any, are binding on me / my company and I am fully aware that, in case of breach of any term or condition of the said Tender document, I am/my company is liable to be disqualified from the said tender process.

Sign:

Name of authorized Signatory:

Name of Company with Stamp:

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Affidavit

(On Rs.100/- Stamp Paper)

I, Age- Yrs, Address –A/P. Tal- Dist- (Authorized signatory to sign the contract), hereby submit, vide this affidavit in truth, that I am the owner of the contracting firm / authorized signatory and I am submitting the documents in envelope no.1 for the purpose of……. scrutiny of the contract. I hereby agree to the conditions mentioned below: -

1. I am liable for action under Indian Penal Code for submission of any false / fraudulent paper / information submitted in envelope no.1.
2. I am liable for action under Indian Penal Code if during contract period and defect liability period, any false information, false bill of purchases supporting proof of purchase, proof of testing submitted by my staff, subletting company or by myself, I will be liable for action under Indian Penal Code.
3. I am liable for action under Indian Penal Code if any paper are found false / fraudulent during contract period and even after the completion of contract (finalization of final bill).

Signature of contractor

Format: Commitment from the Tenderer

(To be submitted separately on Rs.100 stamp paper)

We here by confirm that from proposed 150 KW Grid connected Solar PV Plant we will provide the assured minimum generation of 1300 units per kWp per annum at energy meter in control cabin/room as certified by joint meter reading of manufacturer's representative and user's representative.

Date :

Place: Signature of the Tenderer

Seal

(To be submitted on Rs. 100/- stamp paper)

Affidavit

I .....(Name) has done the project of.....KW for .....(Beneficiary Name), Tender No .....
..... hereby declare that the above-mentioned project is commissioned by abiding following:

The standards and norms set by Ministry of New and Renewable Energy (MNRE) is maintained while installation of project.

The project has been installed under the supervision of electrical contractor/supervisor; the electrical parameters involved in the project have been considered under supervision of electrical contractor/supervisor.

All electrical norms are followed, electrical safety measures are taken in consideration and the project is electrically safe. Electrical contractor/supervisor has authorized the electrical safety measures and norms.

The mechanical safety norms while designing and installation of structure are strictly followed. The solar hot dip structure is tested, approved from engineer and is capable of bearing the load of solar panels, withstand natural parameters (wind, rain) over the duration of project life.

The roof of the building is capable of bearing the load of hot dip galvanized structure and solar panel over the period of project life.

I will be responsible for maintenance of the project over the period of Comprehensive Maintenance Contract (CMC) i.e., 5 years and for the remaining 20 years the beneficiary is responsible for undertaking the maintenance work of the project.

In case of any mishap from the solar project with the parameter mentioned above, I will be responsible. I hereby undertake for the above.

Sign of Project Developer: .....
Stamp: .....
Sign:
Beneficiary Name: .....
Address: .....

----------- Official Sign:

Office Stamp:

SECTION-IV

TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION OF SPV POWER PLANT

150 kW distributed Grid connected Solar PV Plant with net metering including plant cleaning system and CMC system for 5 years

DEFINITION

A Grid Tied Solar Rooftop or ground mounted Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during daytime. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

General System

1. The operating life of the plants shall be minimum 25years.
2. The plant shall feed AC power to the Low Tension (LT) / High Tension (HT) distribution grid power supply through adjacent substation.
3. The plants shall monitor solar generated energy using plant DC / AC energy meter/Bidirectional energy meter independent of load energy monitoring. Remote monitoring facility must be made available.
4. The plant shall consist of PV array, fixed PV array support structure, String/Array combiner boxes, DC cabling, DC distribution box, Inverter, AC cabling, AC distribution box, plant AC energy meter, load energy meter and data acquisition system.
5. The individual Solar PV array shall be installed on existing roof top

of the building using **fixed PV array support structure or on the ground.**

6. The individual string / array combiner boxes and DC cabling shall be installed on roof top of the building.
7. The inverter shall be installed in the control room / open space provided in the building (Terrace)
8. The DC and AC distribution boxes, DC and AC cabling, energy meters and data acquisition system shall be installed in the control room / open space provided in (or near) the building.

PV Array

Solar PV Modules:

The solar plant should comprise of solar polycrystalline modules with capacity of 335 Wp only. The module type must be qualified as per IEC 61215 latest edition for polycrystalline silicon or IEC 61646 for other latest technology. SPV module conversion efficiency should be equal to or greater than 17% under STC. Modules must quality to IEC 61730 Part I and II for safety qualification testing. Certificate for module qualification from IEC or equivalent should be uploaded. Self-undertaking must be submitted from manufacturer/supplier that the modules being supplied are as per above. In addition, the following should be considered:

1. Panels should be made in India and offer warranty of min 25 years with max 20% degradation by year 25. The panel manufacturer should also offer a limited product warranty of 10 years wherein panels should be replaced or repaired in case there is a problem with the panel/module.
2. The panels should be having 6 bus bars to maximize generation and minimize losses
3. Please use the clauses as given below as these are std panel ratings

1. The PV modules used should be made in India.
2. The peak power rating of the Solar PV array under Standard Temperature Conditions (STC) shall be equal to the peak power rating of the plant.

3. The PV array shall consist of framed multi-crystalline.

4. Individual PV modules rating should be of minimum 330 Wp at STC.
5. The rated maximum power rating of PV modules should have positive tolerance in range of 0 to 3 %. And negative temperature co-efficient of power for PV modules should be less than or equal to 0.45% per degree C.
6. A suitable number of Solar PV modules shall be connected in a series string.
7. The PV Array shall be designed to match the inverter input specifications.
8. The module shall be provided with junction box with provision of min. 3Nos. of by-pass diodes and external MC4 type or equivalent plug-in connectors. The junction box should have hinged, weatherproof lid with captive screws and cable gland entry points & should be IP 65 rated.
9. The front surface of the module shall consist of impact resistant, low iron and high transmission toughened glass.
10. The module frame shall be made of corrosion resistant material electrically compactible with structural material used for mounting the modules.
11. Each PV module manufacture in India must have RF identification tag (RFID) compactable with MNRE requirement (Traceability requirement).
12. DC negative conductor shall be bonded to the ground via Ground Fault Detector, Interrupter (GFDI) the grounding point shall be as close as possible to the PV array.
13. The module shall be provided with the junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of bypass diode. The box shall have hinged, weatherproof lid with captive screws and cable gland entry

points or may be of sealed type and IP65 rated.

14. Necessary IV curves at 20^0C, 45^0C, 60^0C, and at NOC are required to be furnished.
15. The PV module must have 10 years free replacement guarantee against material defect or craftsmanship.
16. Name of the manufacture of PV modules, name and manufacture of Solar cell, months and year of manufacture, IV curve, Wattage. Im, Vm, FF for the modules, unique serial number and model number, date and year of obtaining, IEC PV modules, qualification certificates are required to be furnished.

Warranties:

Material Warranty:

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

Performance Warranty:

The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 20-year period and not more than 10% after ten years period of the full

rated original output.

Inverter

The inverter should be min 50 kWp inverters with multiple MPPT's. They should come with remote monitoring feature so that we can monitor the plant continuously and remotely.

The other clauses given below are std ones for Inverters – so we can also use the same.

Common Technical Specification

The PCU shall be able to convey DC power produced by SPV modules into AC power and adjust the voltage and frequency levels to meet the local grid conditions**.**

Control Type: Voltage source, microprocessor assisted, output regulation.

Output voltage: 3 phase, 415 V AC /230 V (+20%, -20% V AC) or as per requirement.

Frequency: 50 Hz (+3 Hz, -3 Hz)

Humidity: 95% non-condensing.

Housing cabinet: PCU to be housed in suitable switch cabinet, IP-20(minimum) for indoor IP-65(Minimum) for outdoor.

Normal Power: 20000 W & 15000 W

Total Harmonic Distortion: less than 3 %

Operating temperature Range: - 25 deg C to +60 deg C

PCU efficiency: 98% and above at full load

PF:>0.9

Other important Features/Protections of PCU:

1. Mains (Grid) over-under voltage and frequency protection.
2. Overload capacity (for 10 sec) should be 200% of continuous rating.
3. The PCU shall be provided with MPPT (Maximum Power Point Tracing) features so that maximum possible power can be obtained from the PV module.
4. The PCU shall be self-commuted and shall utilize a circuit topology/ DSP technology to meet the specifications listed above at high conversion efficiency and with high reliability. The PCU shall be On-Grid one and shall give the preference to feed the Loads from Solar Energy being produced and shall draw the additional power from mains to meet the load requirements in the case load is more than solar energy being produced. Conversely it should feed the solar power to the Grid if the load is less than the solar energy generated.
5. Full proof protection against grid islanding which ensures that the PV power and the grid power get disconnected immediately in the event of grid failure.
6. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683 and IEC 60068 – 2(1,2,14,30) / Equivalent BIS Std.
7. The charge environmental testing should qualify IEC 60068 – 2(1,2,14,30) / Equivalent BIS Std. the junction boxes / enclosures should be IP 75(for outdoor) / IP54 (indoor) and as per IEC 520 specification.
8. The PCU / invertor should be tested from MNRE approved test centres / NABL / BIS / IEC accredited testing – calibration

laboratories. In case of imported power conditioning units, these should be approved by international test houses.

9. The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line-to-ground fault currents.
10. The PCU shall be able to withstand an unbalanced output load to the extent of 50%.
11. The PCU shall go to the shutdown/standby mode with its contacts open under the following conditions before attempting and automatic restart after an appropriate time delay in insufficient solar power output.

12. (a) Utility-Grid Over or Under Voltage

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

(b) Utility-Grid Over or Under Frequency

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

(c) The PCU shall not produce Electromagnetic interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the PCU is housed.

12. Communication Modbus protocol with LAN / WAN options along

with remote access facility.

13. The inverter with MPPT shall be used with the power plant.
14. The sine wave output of the inverter shall be suitable for connecting to 415V, 3 phase AC LT voltage grid.
15. The inverter shall incorporate transformer isolated output (transformer-less inverters shall be used with suitable external transformers), grid islanding protection disconnection of grid & PV power in case of failure of Grid supply suitable DC / AC fuses / circuit breakers and voltage surge protection. Fuses used in the DC circuit shall be DC rated.
16. The inverter shall have internal protection against any sustained faults and/or lightening in DC and mains AC grid circuits.
17. The peak inverter efficiency inclusive of built-in isolation transformer shall exceed 94%. (Typical commercial inverter efficiency normally more than 97%, and transformer efficiency is normally more than97%)
18. The kW ratings of inverter should be chosen as per the PV system wattage.
19. Inverter shall provide panel for display of PV array DC voltage, current and power, AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency. Remote monitoring of inverter parameters should also be available.
20. The inverter shall include adequate internal cooling arrangements (exhaust fan and ducting) for operation in a non-AC environment.

Factory Testing:

1. The PCU shall be tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service, prior to its shipment.

2. Operation of all controls, protective and instrumentation circuits shall be demonstrated by direct test if feasible or by simulation operation conditions for all parameters that cannot be directly tested.
3. Special attention shall be given to demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.
4. Operation of startup disconnect, and shutdown controls shall also be tested and demonstrate.
5. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other necessary test / simulation required and requested by the Purchasers Engineers.
6. A Factory Test Report (FTR) shall be supplied with the unit after all tests. The FTR shall include detailed description of all parameters tested qualified and warranted.

PROTECTIONS:

LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & over voltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. the entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per NFC 17-102:2011 standard. The protection against induced high voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable

earthing such that induced transients find an alternate route to earth.

SURGE PROTECTION

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

Earthing.

1. PV array, DC equipment, Inverter, AC equipment and distribution wiring shall be earthed as per B.E.S.T Standards.
2. Equipment grounding (Earthing) shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV panel mounting structures in one long run. The grounding strips should not be switched, fused or interrupted.
3. The complete earthing system shall be electrically connected to provide return to earth from all equipment independent of mechanical connection.
4. The equipment grounding wire shall be connected to PV power plant.
5. A separate grounding electrode shall be installed using earth pit per power plant. Test point shall be provided for each pit.
6. An earth bus and a test point shall be provided.
7. Earthing system design should be as per the standard practices.

CABLES & WIRES

Cabling in the yard and control room: Cabling in the yard shall be carried out as per IE Rules. All other cabling above ground should be suitably mounted on cable trays with proper covers.

- Wires: Only FRLS copper wires of appropriate size and of reputed make shall have to be used.
- Cables Ends: All connections are to be made through suitable cable/lug/terminals; crimped properly & with use of Cable Glands.
- Cable Marking: All cable/wires are to be marked so that the cable can be easily identified.

Electrical Safety, Earthing Protection

Electrical Safety

- Internal Faults: In built protection for internal faults including excess temperature, commutation failure and overload and cooling fan failure (if fitted) is obligatory.

- Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations and internal faults in the power conditioner, operational errors and switching transients.
- Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.
- Cabling practice: Cable connections must be made using PVC Cu cables, as per standards. All cable connections must be made using suitable terminations for effective contact. The Cu cables must be run in trays with covers for protection.
- Fast acting semiconductor type current limiting fuses at the main bus bar to protect from the grid short circuit contribution.
- The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- The PCU shall include ground lugs for equipment and PV array grounding.
- All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years designed life of the unit.
- The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU intact under all conditions in the room where it will be housed. The INVERTER shall be located indoor and should be either wall / pad mounted. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.

- Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.
- In the design and fabrication of the PCU the site temperature (5° to 55°C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

EARTHING PROTECTION

Each array structure of the PV yard should be grounded properly. In addition, the lighting arrester/masts should also be provided inside the array field. Provision should be kept be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant should be thoroughly grounded in accordance with Indian electricity Act. PCU ACDB & DCDB should be earthed properly.

Danger boards should be provided as and where necessary as per IE Act/IE rules as amended up to date.

Balance of Systems (BoS)

1. String / Array combiner boxes shall incorporate DC string circuit breakers, DC array disconnect switch, lightning and over voltage protectors, any other protection equipment, screw type terminal strips and strain-relief cable glands.
2. All DC and AC cables shall be terminated using suitable crimped cable lugs/sockets and screw type terminal strips.
3. Only terminal cable joints shall be accepted.

4. Suitable Ground Fault Detector Interrupter (GFDI) shall be incorporated either with the inverter.
5. String/Array combiner boxes shall be secured onto walls or metal structures erected separately on the terrace.
6. Conduits / concealed cable trays shall be provided for all DC cabling on the Roof top. Conduits / concealed cable trays shall be adequately secured onto the roof top / wall.
7. The AC cable type shall be PVC / XLPE insulated, suitably armoured 1100 V grade multi stranded, appropriate colour coding shall be used.
8. For the DC cabling, XLPE or XLPO insulated and sheathed, UV-stabilized single core multi-stranded flexible copper cables shall be used.
9. The total DC cable losses shall be maximum of 2% of the plant rated DC capacity over the specified ambient temperature range.
10. The DC and AC cable size shall be selected to maintain losses within specified limits over the entire lengths of the cables.
11. DC cables from array combiner box on the rooftop to DC distribution box in the control room and DC/ AC cabling between inverter and distribution boxes shall be laid inside cable duct where available or secured with conduits/concealed cable trays where duct is not available.
12. The DC and AC distribution boxes shall be wall mounted inside control room/open space.
13. DC distribution box shall incorporate DC disconnect switch, lightening surge protectors, any other protection equipment, screw type terminal strips and strain- relief cable glands.
14. AC distribution box shall incorporate AC circuit breaker, surge voltage protectors, any other protection equipment, plant energy

meter, screw type terminal strips and strain-relief cable glands.

15. All cable conduits shall be HDPE type.

Civil

1. For structural purpose, the panels plus support system that works as a distortion- free integral structural unit.
2. The panel assembly should at most 5m x 5m in plan area. The max height of panel above roof surface does not exceed 1.8 m.
3. The vertical projection area of the longer side of the panels does not exceed W/100 in sq m where W is the gross load of the panel assembly in kg (weight of panels, connections, frames, bracings, pedestals, wiring, circuitry etc.).
4. PV array shall be installed in the space free from any obstruction and /or shadow.
5. Drainage and roof treatment should not be affected by the installation.
6. PV array shall be installed utilizing maximum space to minimize effects of shadows due to adjacent PV panel rows. The gross weight of the panel assembly should at most 45 kg/sq m (W divided by the plan area).
7. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection ease of installation, replacement, cleaning of panels and electrical maintenance. There is at least 1m clear spacing all around the panel assembly (panel edge to panel edge between assemblies, and panel edge to parapet wall / room on the sides).
8. The maximum column spacing should be 8.5 m c/c or less. The pedestal is placed directly on the roof, over existing roof treatment, without making any structural connection to the roof surface.
9. Ample clearance shall be provided in the layout of the inverter and DC / AC distribution boxes for adequate cooling and ease of maintenance.

10. The Supplier will supply and install required size, pump, pipe etc. for cleaning the PV modules.
11. The supplier shall specify installation details of the PV Panel assembly with appropriate diagrams and drawings. Such details shall include, but not limited to, the following:
    a) Determination of true south at the site
    b) Array tilt angle to the horizontal, with permitted tolerance
    c) Details with drawings for fixing the modules
    d) Details with drawings of fixing the junction/terminal boxes
    e) Interconnection details inside the junction/terminal boxes
    f) Structure installation details and drawings
    g) Electrical grounding (earthing)
    h) Inter-panel / Inter-row distances with allowed tolerances and
    i) Safety precautions to be taken.

The array structure shall support SPV modules at a given orientation and absorb and transfer the mechanical loads to the roof top columns properly. All nuts and bolts shall be of very good quality stainless steel. The panel support and panel-to-support connection both must be designed by vendor to withstand adequately high wind forces. Civil Works permission does not guarantee safety against flying/falling panels in the event of a storm or any other accident.

Mechanical

1. PV panel assembly may consist of different number of modules with maximum of 10 PV modules.
2. Each panel assembly shall incorporate one bird repellent spike at a level higher than the panel upper edge. The location of the spike should be selected for minimum shadow effect.
3. Support structure of panel assembly shall be fabricated using corrosion resistant GI or anodized aluminium or equivalent metal sections.

4. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.
5. The support structure shall be free from corrosion when installed.
6. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Screw fasters shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners / clamps shall be adequately treated to resist corrosion.
7. The support structure shall withstand wind loading of up to 150km/hr.
8. Adequate spacing shall be provided between any two modules secured on panel assembly for improved wind resistance.
9. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25years.
10. It is required to design the grid structure (on which PV module will be installed) in such a way that all loads are transferred to the existing columns of the buildings. Such grid design should be presented to the College, which will be certified by

    structural engineers.
11. The panel assembly structure should be installed in a manner to leave sufficient space for repair and maintenance aspects of the roof tops, particularly for leakages.
12. Installation of panel assembly should not tamper with the water proofing of roofs.

ARRAY STRUCTURE

a) Hot dip galvanized (minimum of 80 - 100 Microns) MS mounting structures may be used for mounting the modules / panels / arrays. Each structure should have angle of inclination as per the site conditions to take maximum insolation. However, to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio

requirements.

b) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. Suitable fastening arrangement such as grouting, and calming should be provided to secure the installation against the specific wind speed.
c) The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS4759.
d) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.
e) The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels
f) The bidder needs to supply suitable structures based on the quality of roof and considering the load baring capacity of the roof / civil structures of the proposed building.

Electrical:

1. LT distribution grid specifications 415V +/- 5%, 50Hz and frequency variation as per IE rules or as per requirement.
2. The output of the inverter shall be transformer isolated and shall be fed into 415V, 3 phase AC LT grid supplied via LT Air circuit Breaker.

3. The inverter output shall be connected to LT line prior to the LT/DG changeover switch. The mandatory islanding protection provided by inverter shall isolate the Solar PV power plant.
4. The time of day (TOD) 3 phase, digital AC load energy meter shall be installed in the Main Distribution Box to monitor energy drawn by building load and in the AC distribution box to monitor energy generated by Solar PV power plant.
5. The load energy meter operation shall be completely independent of the plant AC energy meter.
6. The energy meters shall be provided with communication interface and necessary data cables for remote monitoring.

Data Acquisition System

1. Data Acquisition System shall be provided for both Grid connected solar PV plants.
2. Computerized DC String / Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
3. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
4. The time interval between two sets of data shall not be more than 3 minutes. (A minimum of 20 samples of data shall be recorded per hour)
5. Data Acquisition System shall have real timeclock, internal reliable battery backup and data storage capacity to record data round the clock for a period of minimum one year.
6. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.

7. The date shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
8. All instantaneous data shall be shown on the computer screen.
9. Software shall be provided for USB download and analysis of DC and AC parametric data for the plant.
10. Provision for internet monitoring and download of data shall be also incorporated.
11. Software for centralized internet monitoring system shall be also provided for download and analysis of cumulative data of the plant and the data of the solar radiation and environment monitoring system.
12. A data logging system (Hardware and Software) for plant control and monitoring shall be provided.
13. Remote Supervisory Control and data acquisition through SCADA or equivalent software at the purchaser's location with latest software/hardware configuration.
14. Disconnection and Islanding: Disconnection of the PV plant in the event of loss of the main grid supply is to be achieved by in built protection within the power conditioner; this may be achieved through rate of change of current, phase angle, unbalanced voltage or reactive load variants.
15. Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are : Neutral voltage displacement Over current Earth fault and reverse power in case of the above, cases, tripping time should be less than (15 seconds Response time in case of grid failure due to switch off or failure based shut down should be well within seconds. In case of use of two PCUs

capacity suitable equipment for synchronizing the AC output of both the PCUs to the ACDB/Grid should be provided.
Automatic reconnection after the grid failure should restore.

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

Operating Environment

1. Temperature: 5 to 55 Deg. C.
2. Relative Humidity: 100% @ 40 Deg. C
3. Precipitation: 2.46 mm per day (Annual average)
4. Clearness Index: 0.62 (Annual average)
5. Wind Speed: up to 150km/hr.
6. Corrosion: high
7. Dust: moderate to high
8. Bird Interference: high
9. Bird Droppings: frequent and large
10. Trees: large and in abundance.

Plant cleaning system

Plant cleaning system needs to be provided for easy cleaning of solar panels, complete with supply, transportation, insurance, installation and commissioning along with 05 yrs comprehensive maintenance at site.

Any allied work related to mechanical, civil, electrical, plumbing job for successful functioning of the Plant cleaning system as per the specific requirements of the manufacturer.

CONNECTIVITY

The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply

Code of the State and amended from time to time. Following criteria have been suggested for selection of voltage level in the distribution system for Ready reference of the solar suppliers.

Plant Capacity	Connecting voltage
150KW distributed at Guru Nanak Khalsa College of Arts, Science and Commerce, Matunga, Mumbai - 19	230V/ 440V

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

Testing, Certification and Approval Schedule

All components, sub-assemblies and system test parameters shall be verified on site to ensure they meet the specifications.

Plant Power Performance Ratio Testing

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance to qualify for release of applicable incentive. Minimum CUF of 15% should be maintained for a period of 5 years. Correction shall be applied based on available solar radiation.

Plant Energy Performance Ratio Testing

The overall energy performance ratio of the system shall exceed 75%. (Sum total of the system energy losses shall not exceed 20%). For global solar insolation in the Plane of Array (PoA) of 5 kWh/ m^2 (5 Peak Sun Hours) for the day. 150KWp PV power plant AC energy output shall be minimum of **562.5KW**

(30KWx0.75x5Hrs) for the day at Guru Nanak Khalsa College of Arts, Science and Commerce (Autonomous), Matunga, Mumbai 19.

Maintenance (O&M)

1. Cleaning of solar PV modules with soft water, wet and dry mops: Weekly
2. DC String / Array and AC Inverter monitoring: Continuous and computerized.
3. AC Energy monitoring: Continuous and computerized.
4. Visual Inspection of the plant: Monthly
5. Functional Checks of Protection Components and Switchgear: Quarterly.
6. Spring Clean PV Array and Installation Area: Quarterly.
7. Inverter, transformer, data acquisition, energy meters and power evacuation checks: Half Yearly.
8. Support structure and terrace water-proofing checks: Yearly.
9. O & M log sheet shall be provided and maintained.
10. The repair / replacement work shall be completed within 48 hours from the time of reporting the fault.
11. A half yearly performance report of the plant inclusive of energy generation data shall be provided as per approved format.
12. All recorded data for the first 5 years shall be preserved in both manual and computer format and submitted at hand over.

2. COMPREHENSIVE MAINTENANCE CONTRACT (CMC)

(i) The complete Solar PV Power Plants must be guaranteed against any manufacturing / design/ installation defects for a minimum period of 5years.

(ii) PV modules used in Solar PV Power Plants must be guaranteed

for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 20 years.

(iii) During the CMC period, MNRE / users will have all the rights to cross check the performance of the Solar PV Power Plants. The College may carry out the frequent inspections of the Solar PV Power Plants installed and randomly pick up its components to get them tested at Govt. / MNRE approved any test centre. If during such tests any part is not found as per the specified technical parameters, the College will take the necessary action. The decision of the College in this regard will be final and binding on the bidder.

Warranties and Guarantees

1. Solar Modules: Workmanship/ product replacement for 10years.
2. Solar Modules: 90% power output for 10 years & 80% power output for 20 years.
3. Inverter: Workmanship/product replacement for 5 years, service for 20 years
4. Power Evacuation and Metering Equipment: Workmanship/product replacement for 10 years, service for 20 years
5. BoS: Parts and Workmanship for 10 years, service for 20years.
6. Power Plant Installation: Workmanship for 10 years, service for 20 years
7. PV Array Installation: Structural for 20 years
8. Power plant power performance ratio-min75%
9. Power plant energy performance ratio-min.75%

Standards and Compliance

1. IEC 60364-7-712: Electrical Installations of Buildings: Requirements for Solar PV power supply systems.
2. IEC 61727 or similar: Utility Interface Standard for PV power plants > 10kW.
3. IEC 62103, 62109 and 62040 (UL 1741): Safety of Static Inverters – Mechanical and Electrical safety aspects.
4. IEC 62116: Testing procedure of Islanding Prevention Methods for Utility- Interactive PV Inverters.
5. PV Modules: IEC 61730- Safety qualification testing, IEC 61701 – Operation in corrosive atmosphere
6. IEC 61215: Crystalline Silicon PV Modules qualification
7. String/array junction boxes: IP65, Protection Class II, IEC 60439-1,3.
8. Surge Protection Devices: Type 2, DC 1000Vrated.
9. PV module / string / string combiner box interconnects: MC4 compatible. DC 1000V rated.
10. The central inverter shall be rated forIP54.
11. The DC/AC distribution boxes shall be rated IP54.
12. The data acquisition systems shall be rated for IP54.
13. All DC and AC cables, conduits, cable trays, hardware: relevant IS.
14. Earthing System: relevant IS.
15. PV array support structure: relevant IS.
16. Quality Certification, Standards and Testing for Grid-Connected Rooftop Solar PV Systems/ Power Plants should be maintained as

per Annexure A.

APPENDIX- I (A)

Bidder's Information Sheet

Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Sr. No.	Particulars	Indicate page No
1.	Name & Mailing Address of firm	
2.	Contact Person Name, Designation & Contact No.	
3.	E-mail Address for correspondence	
4.	Firm Website Address	
5.	Firm Status (Private / PSU / Incorporate / Proprietor)	
6.	Establish Year of firm	
7.	PAN/ TAN No.	
8.	Firm Registration No / ROC	
9.	GST No	
10.	Turnover 2017-18, 2018-19 & 202020-21 (in Crores Rs.)	
11.	Company Profile (<100 words)	
12.	Skilled manpower	
13.	Experience in SPV Power Plant (<100 words)	
14.	Experience in other solar projects (<100 words)	
15.	Solar related Product Range	
16.	Experience in Guarantee, Maintenance & After Sales Services (Years)	
17.	Accreditation	

Sr. No.	**Particulars**	
18.	List of ISI, ISO, Other cert.	
19.	Technical specification for solar photovoltaic cell / panel /module-make	
20.	Technical specification for Battery-optional–quantity and make	
21.	Technical specification for Junction boxes- quantity and make	
22.	Technical specification for Inverter / Controller -quantity and make	
23.	Technical specification for Cables-quantity and make	
24.	Other Technical specification, if any	
20.	Has any Govt. / Under - taking ever debarred the company / firm from executing any work?	
26.	Special Remarks, if any	
27.	Attached are copies of the necessary original documents.	
I		
II		
III		

It is certified that the information provided above is true to the best of my knowledge and belief. If any information found to be concealed, suppressed or incorrect at later date, our tender shall be liable to be rejected and our company may be debarred from executing any business with the College

Date: Signature of Bidder
Name:
Designation:

APPENDIX- I(B)

Annual Turnover

Each Bidder must fill in this form including private/public limited company

Annual Turnover Data for last 3 Years (AY 2017-18, 2018-19 & 202020-21)	
Year	**Rs in Lakhs**
2017-18	
2018-19	
2019 20	
Total	

The information supplied should be the Annual Turnover of the Bidder in terms of the amounts billed to clients for each year for work in progress or completed.

Signature of Applicant

Certified by Applicant's Auditor (Affix Stamp)

APPENDIX- II

FORM OF PERFORMANCE BANK GUARANTEE

To:

_____,

_____,_____Pin: – 411006

WHEREAS_____*[name and address of Contractor]* (hereinafter called "the **Contractor**") has undertaken, in pursuance of **Work Order No.**_____**Tender No.....**
For works --_____**,** dated___2018 to Design, Fabrication, Supply, Installation, Testing, Commissioning and Maintenance of 150 KW distributed on Grid connected solar PV plant under roof top net metering with 5 years of Comprehensive maintenance including plant cleaning system and RMS monitoring along with insurance of project for 5 years at ----------, ----------, ---------- in the state of Maharashtra. (hereinafter referred to as the contract of works) and as described in the Bidding Data in Maharashtra State for works under single point responsibility **"Turnkey Contracts"** basis (hereinafter called "the **Contract**").

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

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee.

SIGNATURE AND SEAL OF TENDERER

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of

_____*[amount of Guarantee]*

_____*[in words]*, and we undertake to pay you, through our branch office at_____upon your first written demand and without cavil or argument, any sum or sums within the limits of _____*[amount of Guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

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

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

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

APPENDIX- III

Experience for supply and Commissioning of Solar Power Plants

Sr. No.	Name of Project	Plant Capacity	Year of Work	Current Status of Project / Client's Certificate

*Self-attested copy of work order attached herewith

Signature of

Bidder Name

Designation

Company

Date

APPENDIX- IV

SITE VISIT REPORT LETTER

(To be submitted on letterhead of bidder)

Date: _____

To,

,_____.

Sub.: Site Visit Report for installation of 150KW distributed on Grid Connected SPV power plant at Guru Nanak Khalsa College of Arts, Science and Commerce, Matunga, Mumbai – 400 019

Ref.: ----------'s

Tender No. ----------

Sir,

This has reference to above referred tender of electrification of Guru Nanak Khalsa College of Arts, Science and Commerce, Matunga, Mumbai – 400 019 (Maharashtra) to be electrified through Solar Power.

I / We hereby declare that we have visited site.

I / We made ourselves acquainted with site conditions, approach to site, requirement of land, soil conditions, availability of water, requirement of tender conditions etc.

I / We verified all details required to execute the projects.

I / We have no problems in undertaking the projects and complete them in the given time period.

Thanking you

Yours faithfully,

Signature of Beneficiary authorities,

(Signature of Bidder)
Name of Bidder ----------
Designation ----------
Seal:

Seal:
.....

Signature-----authorities.

Seal: .....

Annexure A

QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID-CONNECTED ROOFTOP SOLAR PV SYSTEMS/ POWER PLANTS

Quality certification and standards for grid-connected rooftop or ground mounted solar PV systems are essential for the successful mass-scale implementation of this technology. It is also imperative to put in place an efficient and rigorous monitoring mechanism, adherence to these standards. Hence, all components of grid-connected rooftop solar PV system/ plant must conform to the relevant standards and certifications given below:

Solar PV Modules/Panels	
IEC 61215 / IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61701	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853- Part 1 /IS 16170: Part 1	Photovoltaic (PV) module performance testing and energy rating –: Irradiance and temperature performance measurements, and power rating
IEC 62716	Photovoltaic (PV) Modules – Ammonia (NH3) Corrosion Testing (As per the site condition like dairies, toilets)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification – Part 1: Requirements for Construction Part 2: Requirements for Testing
Solar PV Inverters	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems Part 2: Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)

IEC/IS 61683 (as applicable)	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 20%, 50%, 75% & 90-100% Loading Conditions)
IEC 62116/ UL1741/ IEEE 1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Islanding Prevention Measures
IEC 60205-27	Measuring relays and protection equipment– Part 27: Product safety requirements
IEC 60068- 2 /IEC 62093 (as applicable)	Environmental Testing of PV System – Power Conditioners and Inverters
Fuses	
IS/IEC 60947(Part 1, 2 & 3), EN50521	General safety requirements for connectors, switches, circuit breakers (AC/DC): a) Low-voltage Switchgear and Control-gear, Part 1: General rules b) Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers c) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors, switch- disconnectors and fuse-combination units d) EN50521: Connectors for photo voltaic systems–Safety requirements and tests
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary requirements for fuse- links for the protection of solar photovoltaic energy systems
Surge Arrestors	
BFC 17 -102: 2011	Lightening Protection Standard
IEC 60364-5-53/ IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
IEC 61643- 11:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods
Cables	

IEC 60227 /IS694, IEC 60502 /IS1554 (Part 1 & 2) / IEC 69947 (as applicable)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)208), mainly for DC Cables
Earthing /Lightning	
IEC 62061 Series (Chemical earthing) (as applicable)	IEC 62061-1 Lightning protection system components (LPSC) - Part 1: Requirements for connection components IEC 62061-2 Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes IEC 62061-7 Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	Junction boxes and solar panel terminal boxes shall be of the thermo-plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use
Energy Meter	
IS 16444 or as specified by the DISCOMs	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2 — Specification (with Import & Export/Net energy measurements)
Solar PV Roof Mounting Structure	
IS 2062/ IS 4759	Material for the structure mounting

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

ANNEXURE - B

Check List

All the necessary Documents / Certificates should be uploaded as in proper sequence as mentioned below:

1. Original tender document duly signed and stamped on each page or Undertaking (Rs.100) and declaration that all the terms & conditions mentioned in each and every page of the said tender document with further clarifications released if any are acceptable.
2. EMD and Tender document fee (EMD relaxation as per above).
3. Name of authorized person (power of attorney) for submitting the document.
4. Name of the Banker.
5. Copy of the recently paid Income Tax Challan /Return, Latest CA certified balance sheet of last three years, PAN number, registration certificates of GST, professional tax etc. (Self-Attested)
6. Information on Infrastructure for maintenance work.
7. Registration Certificate of the firm.
8. Information of Licensed Electrical Contractor.
9. Bidder's Information Sheet **Appendix-I(A)**.
10. Annual Turnover **Appendix-I(B)**.
11. Experience for supply and commissioning of Solar Power Plants **Appendix-III** (along with the self-attested copies of work order).
12. Site visit Report for the location, **Appendix-IV**.
13. IEC 61215 (revised) certificate for SPV module, IEC 61683 for Inverter a nd IEC 61427 / IS 1651/ IS 133369 for Storage batteries as per Annexure -A**.**
14. Commitment in respect of generation separate for Grid connected solar power plants in the prescribed format given the tender.

If any of the documents is not uploaded the tender will be rejected.

AFFIDAVIT (on Rs. 500/- Stamp Paper)

I…….....age……..address ……(Authorized signatory to sign the contract),hereby submit, vide this affidavit in truth, that I am the owner of the contracting firm……../ authorized signatory and I am submitting the document sin envelope no.1 for the purpose of scrutiny of name of work …… the contract. I hereby agree to the conditions mentioned below:-

1. I am liable for action under indian Penal code for submission of any false / fraudulent paper / information submitted in envelope no.1
2. I am liable for actio under Indian Penal code if during contract period and defect liability period, any false information, false bill of purchases supporting proof of purchase, proof of testing submitted by my staff, subletting company or by myself, I will be liable for action under Indian Penal Coede.
3. I am liable for action under Indian Penal Code if any paper are found false / fraudulent during contract period and even after the completion of contract (finalisation of final bill) .

(Signature of Supplier)

(Seal of Company)