

**OFFICE OF THE
DISTRICT & SESSIONS JUDGE,
SOUTH TRIPURA, BELONIA.**

No.F.5(33)/DJ/S/BLN/NAZ//2020-21/ 1108-121

Dated, Belonia,
the 1st February, 2021.

NOTICE INVITING TENDER

Sealed quotations are invited from the reputed and experienced service providers/ firms for design, supply, instalation commissioning & maintenance of 7.50kWp Solar PV Hybrid (without grid export) with Battery backup Rooftop Solar Power Plant at District & Sessions Judge's Court, South Tripura, Belonia. **The last date & time of submission of tender is on 12.02.2021 at 12.00 noon and will be opened on 12.02.2021 at 1.00 p.m. in presence of the member of the Higher Purchase Committee.**

The details of eligibility and qualification criteria and other terms & contitions are available in the **Nazarat Sectiion**, Court of the District & Sessiions Judge, South Tripura, Belonia, **Official Notice Board** and in the **Official websiste of South Tripura Judicial District** (<http://ecourts.gov.in/scuth-tripura/home>).

Enclosed :- **Tender Bid Documents.**

(ANNEXURE-1) 19 Sheets.

1.2.2021
(U. Choudhuri)
District & Sessions Judge
South Tripura, Belonia.

Copy to :-

1. The Registrar General, Hon'ble H.gH Court of Tripura, Agartala for kind information.
2. The Chief Judicial Magistrate-curr - Civil Judge (Sr. Division), South Tripura, Belonia (**Head of Office**) for information.
3. The Addl. S.P., South Tripura, Belonia (Member of H.P.C) for information.
4. **The System Officer, Office of the District & Sessions Judge, South Tripura, Belonia is hereby asked to take necessary steps regarding uploading of this tender notice in the official website of South Tripura Judicial District immediately.**
5. NOTICE BOARD.
6. OFFICE FILE.

1.2.2021
District & Sessions Judge
South Tripura, Belonia.

TENDER BID DOCUMENT

For

**Design, Supply, Installation Commissioning
& Maintenance of
7.50kWp Solar PV Hybrid (without Grid export)
with Battery backup Rooftop Solar Power
Plant
At**

**Court of the
District and Sessions Judge,
South Tripura, Belonia**

**Court of the
District and Sessions Judge
South Tripura, Belonia**

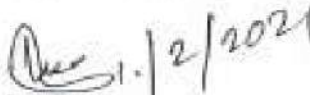
1. Notice Inviting Bid

Sealed tenders are invited from the Manufacturers Installer for solar PV Power Plant Design, Supply, Installation & Commissioning and 5 years Maintenance capacity of 7.50kWp Solar PV Hybrid (without Grid export) with Battery backup at District and Session Judge Court, South Tripura, Belonia

Last date for submission of tender is 12/02/2021 at 12 noon and the same will be opened on 12/02/2021 at 1 p.m.

Tender documents may be available in the Court office on any working days. All terms & conditions as mentioned in the tender documents should be bindings on the bidder.

The Court authority may reject any tender without showing any reason.


Authorized Signatory
(U. CHOUDHURI)
District & Sessions Judge
South Tripura, Belonia.

2. Eligibility and Qualification Criteria

1. The bidder should have experience in to design, supply, installation & commissioning the Solar PV modules for Solar PV Power plant up to a minimum total capacity of 25 kWp.
2. The bidder must have office in Agartala, Tripura.
3. The annual turnover of the bidder should not be less then Rs.20.0 lakhs
4. The bid should be submitted in a sealed envelope and bid should be signed in all the pages by the authorized signatory.
5. The Bidder should have valid GST registration certificate. A copy of which should be enclosed.
6. The taxes and duties should be clearly indicated in the offer.
7. Min. value of works already completed in a single tender with reputed concerns should be Rs.15lakhs.

3. Other Terms & Conditions

1. The bidder should have experience in to design, supply, installation & commissioning the Solar PV modules for Solar PV Power plant up to a minimum total capacity of 25 kWp.
2. The bidder must have office in Agartala, Tripura.
3. The annual turnover of the bidder should not be less then Rs.20.0 lakhs
4. The bid should be submitted in a sealed envelope and bid should be signed in all the pages by the authorized signatory.
5. The Bidder should have valid GST registration certificate. A copy of which should be enclosed.
6. The taxes and duties should be clearly indicated in the offer.
7. Min. value of works already completed in a single tender with reputed concerns should be Rs.15lakhs.

4. General Terms & Conditions

1.0 Scope of Work

The Scope of work for Design, Supply, Installation & Commissioning and 2 years Maintenance of 7.50kWp Solar PV Hybrid (without Grid export) with Battery backup Rooftop Solar PV Power Plant at District and Session Judge Court South Tripura, Belonia.

2.0 Quantity of Supply

The quantity required as given in the Bid Details of Notice Inviting Bid is final & firm.

However, there may be slight variation during execution. The extra items if any shall be paid separately.

3.0 Effective Date of Contract

The effective date of commencement of execution of the order by the selected contractor shall be the date of issue of the work Order.

4.0 Contract Price

The contract price includes supply of items in full & good condition at District and Session Judge Court South Tripura, Belonia and all the incidental charges towards packing & forwarding, inspection, installation at site, door delivery charges, loading charges at site and transit insurance up to installation site. Contract Price is also inclusive GST, professional tax, service charge, income tax, entry tax, labourcess, etc. as applicable for the supplies.



(D. GHOSHURI)
District & Sessions Judge
South Tripura, Belonia.

5.0 Terms of Payment

As per Court norms

6.0 Dispatch Instructions:

All the Materials shall be subjected to inspection by Court officials before dispatch.

7.0 Transit Insurance:

Transit Insurance shall be arranged by the Supplier for his total supplies. In case of any damage/loss/pilferage/non-delivery during transit, the Supplier shall lodge the claim and settle the claim with the insurance agency. The Supplier shall also arrange replacement of the damaged, lost/pilfered items expeditiously pending settlement of commercial implications with insurance agency, if any, so as not to hamper the working of the system. The resultant loss if any due to failure of Supplier to comply with the above shall be to the account of the Supplier.

6. Technical Specification


5.1. SOLAR PV MODULES:

The SPV Module must be tested, approved & certified by any one of the IEC authorized test centers - NA3L/BIS Accredited Testing/Calibration Laboratories or by any International IEC authorized test center. The PV modules must conform to the latest edition of any of the following IEC/equivalent BIS Standards for PV module design qualification and type approval (as per JNNSM):

Type of Module: -Crystalline Silicon Terrestrial PV Modules - IEC 61215/IS14286. The manufacturer should certify that the submitted module is also manufactured using same design and process and modules being supplied are as per above.

In addition, the modules must conform to IEC 61730 Part1-requirements for construction & Part 2- requirements for testing, for safety qualification. I-V curve both soft copy & hard copy must be provided (Image/PDF).

1. Total Capacity of the Solar PV Modules 7.50kWp with positive tolerance under STC after one year of operation. Crystalline Silicon Solar Cells No. 72 Nos.
2. Module conversion efficiency should be equal to or greater than 17% under STC.
3. Electrical characteristics of each module should be as per IEC specifications.



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District & Sessions Judge
South Tripura, Belonia.

4. Other general requirements of the SPV Modules and sub-systems shall be as follows:
- (a) The rated power output of any supplied module shall not vary more than 0.5% (five percent) from the average power rating of the modules.
 - (b) Peak power point voltage and the peak power point current of any supplied module and/or any module string (series connected module) shall not be more than 5% from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
 - (c) Except otherwise specified, the front module surface shall consist of impact resistant, tempered & textured, low iron and high transmission glass. Thickness 3.2 mm (minimum).
 - (d) The module frame Anodized aluminium type shall be made of corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules.
 - (e) The module shall be provided with a junction with provision of external screw terminal connection and with arrangement for provision of by-pass diode. (Minimum 3 Nos. by-pass diode & System Voltage 1000V) The box should have hinged, weatherproof lid with captive screws and cable gland entry points protection level IP65.
 - (f) The PV module shall perform satisfactorily in humidity up to 100% with temperature between minus 10° Celsius to plus 65° Celsius and to withstand a gust upto 200 km/hr. from back side of the modules.
 - (g) The rated output power of any supplied module shall have a tolerance of +/-5% as per MNRE/IEC standard specification.
 - (h) The fill factor of modules shall not be less than 0.70.

• **Identification And Traceability**

Each PV module must use a RF identification tag (RFID), which must contain the following information:

- i. Name of the Manufacturer of PV module
- ii. Name of the Manufacturer of Solar cells
- iii. Month and year of the manufacture (separately for solar cells and module)
- iv. Country of origin (separately for solar cells and module)
- v. I-V curve for the module
- vi. Peak Wattage, I_m , V_m and FF for the module
- vii. Unique Serial No. and Model No. of the module
- viii. Date and year of obtaining IEC PV module qualification certificate


(U. CHO)
District & Sessions Judge
South Tripura, Belgaon.

- ix. Name of the test lab issuing IEC certificate
- x. Other relevant information on traceability of solar cells and module as per ISO 9000 series.

Until March, 2013, the RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions. However, from 1st April, 2013 onwards RFID should be mandatorily placed inside the module laminate.

• **Warranty**

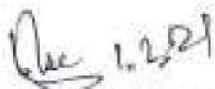
- i. PV modules used in solar power plants/systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.
- ii. The mechanical structures, electrical works including power conditioners/inverters/charge controllers/distribution boards/digital meters/switchgear/storage batteries, etc. and overall workmanship of the SPV power plants/systems must be warranted against any manufacturing/design/installation defects for a minimum period of 5 years.

5.2. MODULE MOUNTING STRUCTURE:

5.1. The array structure shall be made of hot dip galvanized MS angles of size not less than 50 mm x 50 mm x 6mm size. The minimum thickness of galvanization should be at least 85 microns. All nuts & bolts shall be made of very good quality stainless steel. The minimum clearance of the lowest part of the module structure and the developed ground level shall be 600 mm.

5.2 Leg assembly PV Module mounting structure made of different diameter galvanized tubes may be accepted. The work should be completed with supply, fitting fixing of clamps, saddles, nut & Bolts etc. While quoting rate, the bidder may mention the design & type of MMS. The minimum thickness of galvanization should be at least 85 microns.

All nuts & bolts to be used for the system should be lock nut & bolt (anti-theft nut & bolt) and made of very good quality stainless steel except foundation bolts and the nuts to be used for connection of earthing strip with module mounting structure which will be of MS chrome plated. The structure will be designed for easy and simple mechanical and electrical installation. It will support SPV modules at the mentioned orientation and absorb, transfer the mechanical loads to the ground or any suitable/existing strength structure as deemed fit.



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South Tripura, Belonia.

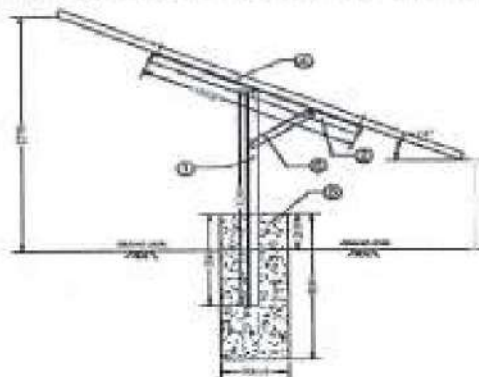
5.3. The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.

5.4. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV modules at the same time it will withstand severe cyclonic storm with wind speed upto maximum 200 kmph.

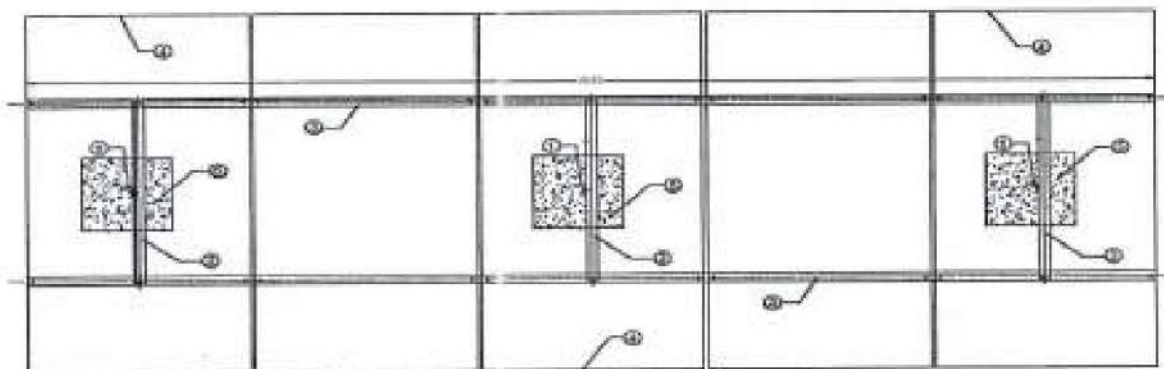
5.5. The supplier/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings. Such details shall include, but not limited to the following:

- 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/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.

5.6. The drawings along with detailed design shall be submitted in triplicate to College for approval before starting the execution work.



Sl. No.	DESCRIPTION
1	LEG MEMBER (ISA 60x60x6)
2	CROSS MEMBER (ISA 50x50x4)
3	MODULE SUPPORT MEMBER (ISA 60x60x6)
4	PV MODULE (1001x601x40)
5	RCC PEDAISTAL (300x300x800)mm
6	ANGLE SUPPORT MEMBER (ISA 40x40x4)



TYPICAL MMS DIAGRAM

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 (U. CHOUDHURI)
 District & Sessions Judge
 South Tripura, Belonia

5.3 RCC ARRAY FOUNDATION BASE:

- 3.1 The legs of the structures made with GI angles will be fixed and grouted in the RCC foundation columns made with 1:2:4 cement concrete. The minimum clearance of the lowest part of any module structure shall be 600 mm from ground level. While making foundations designs due consideration will be given to weight of module assembly, maximum wind speed of 200 km per hour. Seismic factors for the site to be considered while making the design of the foundation.
- 3.2 Proper Foundation Bolt should be fitted on the roof to ensure positive locking the Module Mounting Structure with the roof.
- 3.3 Proper adhesive should be add on the foundation base and the roof junction area to ensure leak proof.

5.4 POWER CONDITIONING UNIT/INVERTERS

The Power Conditioning Unit/Inverters must conform to the latest edition of IEC/equivalent BIS Standards as specified below:

Efficiency Measurements	-	IEC 61683	Equivalent Std.	BIS
Environmental Testing	-	IEC 60068 (1,2,14,30)/	2 Equivalent Std.	BIS

Technical features:

Solar Charge controller capacity	7.5kVA
DC rated voltage	56/120V
Type	MPPT
Charger type	Euck type
Solar PV capacity	7.5kWp
Peak charging efficiency	94%
Output voltage & Frequency	230VAC Single phase, True Sine wave 50HZ
Voltage regulation	± 2%
Frequency regulation	☑ 0.5%
Degree of protection	IP67
THD	<3%
Load bypass feature	Should be there
Operating temperature range	-10 °C
Battery type	Lead Acid tubular/ LMLA
Battery charging process	3stage (Bulk/ Absorb/float)
Protections	AC over voltage/ AC under voltage/ Over temperature/ AC under voltage/ Battery over voltage/ PV reverse polarity/ output overload/ Battery under voltage/ PV surge protection/ output short circuit/ battery reverse polarity/ PV over voltage/ AC over frequency/ Battery current limit/ Galvanic isolation


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Displayed parameters	Inverter voltage & current/ Battery voltage & current/ PV voltage & current/ Inverter Grid frequency/ Battery temperature/ Inverter load (kVA)/ Battery charging mode/PV KWH cumulative/ 30days daily PV kWh/ Monthly generated kWh/ Yearly generated kWh/PV Power(kW)/ System temperature/ Grid voltage & current
Faults displayed on LCD	Inverter under/ over voltage, PV under/ over voltage, Solar charger over load, System over load, Battery under voltage, DC over voltage, AC under/ over frequency, System Trip/off, System over temperature
LED indications	System power on, Load On Grid/ Grid charging/ Grid available, Inverter ON (Load on Inverter), Battery under voltage Shut, Solar Available/ Solar charging, System trip/ fault
Remote monitoring	RS 232- All the parameters can be remotely seen on PC/ Laptop via provided software. All the logged parameters can be saved in Excel format. GPRS- All the parameters can be viewed over internet by accessing through a user I.d and password
Housing	Table top/ wall hanging/ Floor standing
Type of cooling	Forced fan temperature controlled

Electrical safety, earthing and protection:

- a. Internal Faults: Inbuilt protection for internal faults including excess temperature, commutation failure, and overload and cooling fan failure (if fitted) is obligatory.
- b. Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required. Protection is to be provided against voltage fluctuations in the grid itself and internal faults in the power conditioner, operational errors and switching transients.
- c. 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.

(Signature) 1/2/21

(U. CHOUDHURI)

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South Tarpura, Belonia.

- d. Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in GL trays with covers for protection.
- e. Fast acting semiconductor type current limiting fuses at the main bus-bar to protect from the grid short circuit contribution.

Other important Features/Protections of PCU:

- (a) The PCU shall be self-commuted and shall utilize a circuit topology/DSP technology and components suitable for meeting the specifications listed above at high conversion efficiency and with high reliability.
- (b) Since the PCU is to be used in solar photovoltaic energy system, it should have high operational efficiency.
- (c) The idling current -if no load, must not exceed 2 percent of the full-load current.
- (d) The PCU shall have an appropriate display on the front panel to display the instantaneous AC power output and the DC voltage, current and power input. The display shall be visible from outside the PCU enclosure. Operational status of the PCU, alarms, trouble indicators and AC and DC disconnect switch positions shall also be communicated by appropriate messages or indicator lights on the front of the PCU enclosure.
- (e) The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- (f) The PCU shall include ground lugs for equipment and PV array grounding.
- (g) The dimension, weight, foundation details etc. of the inverter shall be clearly indicated in the detailed technical specification and the same should be submitted along with the bid.
- (h) The Inverter shall have provision for input & output isolation. Each solid-state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.
- (i) Supplier shall indicate tripping voltage & start up voltage for the inverters.

5.5 STORAGE BATTERIES/BATTERY BANK


5.1. The Storage Batteries/Battery Bank must conform to the latest edition of IEC/ equivalent BIS Standards as specified below:

General Requirements & Methods of Test - IEC 61427

LMLA Tubular Battery - IS 1651/IS 13369

5.2. The permitted maximum depth of discharge (DOD) shall be specified by the supplier in the offer. Unless otherwise specified, the cycle life of the battery shall not be less than 1500 charge-discharge cycles between fully charged state and the permitted maximum DOD (80%) at a rate of C/10, end of life shall be 80% of the rated capacity.

5.3. Each battery shall be fitted with explosion proof safety vents.


(U. CHOUDHURI)
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South Tripura, Dibrugarh

5.4. All technical and other details pertaining to the storage cells shall be supplied including but not limited to the following: i) Rated voltage and Ampere-hour capacity of each storage cells and their rated discharge rate; Permitted maximum DOD; ii) Self discharge rate; iii) Cycle life of the storage cells and anticipated life of the battery banks; iv) Instructions on first time charging including specification of the battery charger; v) Details on cell connections; and vi) Safety procedures.

5.5. One set of battery maintenance tools consisting of Thermometer, Cell Tester, Hydro Meter, battery connection leads, Acid Proof Hand Gloves, Gumboots and one set of hand tools suitable for making battery connections to be supplied with the Battery Banks.

5.6. Suitable size and adequately strong battery rack should be supplied with each battery banks. The placement of battery should be such that maintenance of battery could be carried out easily.

5.7. The battery shall be of 12V cells with end cut off voltage 10.8V per cell and battery terminals shall be provided with insulated covers.

5.8. The system voltage of 7.50 kWp SPV Power Plant is 120 V, therefore the battery bank should comprise of **20 numbers of 12V 150 Ah each to make 120 V 300Ah Battery Bank** (under standard test condition) of low maintenance, tubular **LMLA** Type battery having long service life (minimum five years). The cells shall be capable of deep discharges and frequent cycling with long maintenance intervals and high columbic efficiency.

5.9. The self-discharge of batteries shall be less than 3% per month at 200 C and less than 6% per month at 300 C.

5.10. Specification should consist of:

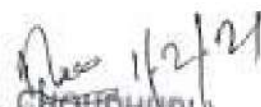
- a) Manufacturer
- b) Type of battery
- c) Nominal Voltage
- d) End cell voltage
- e) Capacity of battery system
- f) Depth of discharge
- g) Days of autonomy
- h) Efficiency of battery
- i) Duty cycle
- j) Structural details of bank
- k) Battery guarantee

5.6 JUNCTION BOXES/ENCLOSURES:

6.1 The Junction Boxes/Enclosures must conform to the latest edition of IEC/ equivalent BIS Standards as specified below:

General Requirements - IP 65 (for outdoor)/IP 21 (for indoor), - IEC 62208

6.2 The junction boxes shall be dust, vermin and waterproof and made of FRP. The terminals will be connected to copper bus-bar arrangement of proper sizes to be provided with EPDM rubber gasket to prevent water entry. The junction boxes will have suitable cable entry points fitted with


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District & Sessions Judge
South Tripura, Belonia.

cable glands of appropriate sizes for both incoming and outgoing cables with provision of earthing. Suitable markings shall be provided on the bus-bar for easy identification and cable ferrules will be fitted at the cable termination points for identification. Suitable arrangement shall be provided for connecting 'Reverse Blocking Diodes' in the Array junction Boxes.

6.3 The Junction Boxes shall have suitable arrangement for the followings:

(a) Combine groups of modules into independent charging sub-arrays that will be wired into the controller.

(b) Provide arrangement for disconnection for each of the groups.

(c) Provide a test point for each sub-group for quick fault location & also group array isolation.

(d) The rating of the JBS shall be suitable with adequate safety factor to inter connect the Solar PV array.

(e) Suitable capacity MOVs provided within the box to protect against lightning.

Technical features:

Item Description	Desired Data
Enclosure	
Degree of Protection	IP65
Material	Polycarbonate.
Withstanding Voltage	1000V DC
Withstanding Temperature	100° C
Accessories mounting arrangement	As suitable
Number of Strings entry	As may be required
Item Description	Desired Data
Cable Entry and Exit	
Position	Bottom at cable entry and exit
Cable Entry and Exit connector type	MC4 (PV Array String cable)
Cable gland	Earthing cable entry
Fuse with fuse holder	
Position	Positive and negative terminal for each series string
Type	Glass fuse, for PV use only
Rating	Current: Minimum 1.25 times the rated short circuit
Earthing Provision	Terminal blocks will have to be provided for Earthing

5.7 AC DISTRIBUTION BOARD (ACDB)

This shall consist of box of suitable powder coated metal casting. One feeder per phase shall be provided in ACDB with MCB of suitable capacity installed at each feeder in the ACDB. **One Electronic Energy Meter, ISI make, Single Phase, of good quality shall be installed in ACDB suitably placed to measure the consumption of power from SPV Power Plant.** Proper rating MCB shall be installed at every feeder to protect feeders from short circuit current as per requirement of the site. A separate dedicated feeder from

U. Choudhuri
1/2/21

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District & Sessions Judge
South Tripura, Belonia.

conventional/grid line to PCU/Inverter as well as ACDB should also be installed. A separate change over switch of proper rating should be suitably installed in the ACDB to isolate the existing connected load from the SPV system and cater the power to the existing load from conventional/grid line, in case of emergency. ACDB should be connected between PCU and Load. Proper separation of distribution line of load for operation of other load of the Complex should be made so that there is no overload for the SPV Plant.

5.8 CABLES

8.1 The Cables must conform to the latest edition of IEC/equivalent BIS Standards as specified below:

General Test & Measuring Methods	IEC 61427
PVC insulated cables for working Voltages upto & including 1100V	IS 694/IS 1554
-do-, UV resistant for outdoor installation	IS/IEC 69947

- 8.2 Unit length of cable has been shown in respective item in running meter. The length of cable shown is indicative & actual length may vary depending on layout, design & site condition. However, payment will be made on basis of actual utilization.
- 8.3 All cables shall be PVC insulated 1100 V grade conforming to IS: 694-1990 or IS: 1554 (Part-I).
- 8.4 The wiring for module inters connection shall be with hard PVC conduit of BIS approve make. All Tees, Bends etc. shall also be BIS approve make hard PVC material
- 8.5. Cables in the array yard shall be laid direct in ground at a depth of 500 mm in the excavated trenches along the approved route and covered with sand cushion. A continuous single brick protective layer of first class brick shall be placed over the entire length of the underground cable before refilling the trench with loose soil. Alternatively, 6" wide continuous layer of 1½" thick concrete cable markers may also be provided as protective cable cover. The cables shall be laid inside class-B, GI pipes of suitable size under road crossings, drains, sewerage lines, entry or exit points of the buildings or where there are chances of mechanical damage.
- 8.6 Cables on the roof shall be laid in suitable Cable Tray.
- 8.7 All wires shall conform to IS: 694-1990 (as amended upto date) and should be of 650/1100 volt grade as per requirement. Only copper conductor wires of reputed make shall be used. Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles. The panels' bottoms should be properly sealed to prevent entry of snakes inside the panel.
- 8.8 All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
- 8.9 The terminal end of cables and wires are to be fitted with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.


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District & Sessions Judge
South Tripura, Belonia.

The details specifications are as follows:-

Item	Description
DC Cable	
Conductor	Tinned annealed stranded flexible copper
Insulation	PVC
Standard	IS : 694
Make	Polycab / LAPP / Top Solar / Nexans / Schneider or equivalent
AC Cable	
Rated Voltage	1.1 kV
Construction	Excellent resistance to Heat, Fire, Oil, Cold, Water, Abrasion, UV radiation
Type	Armoured or Unarmoured as per requirement
Conductor	Stranded flexible Copper / Armoured aluminium
Insulation	PVC
Standard	IS : 1554
Make	MESCAB / Polycab / LAPP / Havell's / RR Cable or equivalent

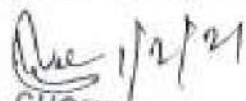
SUB-MAIN WIRING

Sub-main wiring will be casing capping type with 2 X 2.5 mm² PVC insulated 1.1 kV grade Cu wire drawn with appropriate size bare Copper earth wire from MCB DB to JB/SB connector Box for individual circuits. The work includes supply of all requisite materials. The casing capping shall be Hard PV made.

5.9 LIGHTNING & OVER VOLTAGE PROTECTION

- General Requirements - IS/IEC 60947 part I,II,III
 Connectors-Safety - EN 50521

- 9.1 The Switches/Circuit Breakers/Connectors must conform to the latest edition of IEC/equivalent BIS Standards as specified below:
- 9.2 The SPV Power plants should be provided with Lightning and over voltage protection connected to proper earth pits. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.
- 9.3 The Lightning Conductors shall be made of 20mm - 25 mm diameter 3000mm - 4000 mm long G. I. Spike as per provisions of IS 2309-1969. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to maximum wind speed and maintenance requirement at site in future. The lightning conductor shall be earthed through 20 mm x 3 mm thick GI flat with earth pits/earth bus made with 25 mm x 5 mm GI flats. Each Lightning Conductor shall be fitted with individual earth pit made with GI pipe, 4.5 m long 40 mm diameter including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS:3043.


 (U. CHOUDHURI)
 District & Sessions Judge
 South Patna, Bihar.


9.4. The bidder shall ensure adequate lightning protection to provide an acceptable degree of protection as per IS: 2309 for the array yard. If necessary more numbers of Lightning conductor may be provided, in such a case payment will be made on actual basis.

5.10 EARTHING SYSTEM

- 10.1 The earthing for array and distribution system shall be made with GI pipe, 4.5 m long 40 mm diameter including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS: 3043. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- 10.2 Each Array structure of the SPV Yard shall be grounded properly. The array structures are to be connected to earth pits through 25 mm x 5 mm GI strip.
- 10.3 The earthing for the power plant equipment shall be made with copper plate 600 mm x 600 mm x 3 mm thick including accessories, masonry enclosure with cover plate having locking arrangement and watering pipe etc using charcoal or coke and salt as per provisions of IS: 3043. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- 10.4 The earth conduction shall run through GI pipe partly buried and partly on the surface of the control room building.
- 10.5 The complete earthing system shall be mechanically & electrically connected to provide independent return to earth. All three phase equipment shall have two distinct earth connections.
- 10.6 The inverters and all equipment inside the control room to be connected to earth through 25 mm x 5 mm tinned copper strip including supplying of material and soldering. An Earth Bus shall be provided inside the control room with 25 mm x 5 mm tinned copper strip of minimum length 25m. The strip & all earth bus should run on suitable size porcelain base fixed on wall surface.
- 10.7 In compliance to Rule 33 and 61 of Indian Electricity Rules, 1956 (as amended upto date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

The details specifications are as follows:-

- i. Equipment grounding (Earthing) will connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV panel mounting structures.
- ii. Array Structure will be earthed with GI Strip / GI wire.
- iii. The complete earthing system will be electrically connected to provide return to earth from all equipment independent of mechanical connection.
- iv. Earthing system design to be as per the standard practices.
Minimum Two (02) numbers of earth pit (1 No. For PV Structure (DC) Inverter 1 No. (AC) and 1no. For lightning arrestor)


(U. CHOUDHURI)
District & Sessions Judge
South Tripura, Belonia.

5.11. OTHERS ACCESSORIES

DANGER PLATES

Size of the each Danger Notice plates will be 200 mm x150 mm made of mild steel sheet and at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in signal red colors on front side as required. The inscriptions shall be in Bengali script and English. Fixing on wall conforming IS 2546.

5.12. DOCUMENTATION

An operation, instruction, maintenance manual in English should be provided with the Solar Power Plant. The following minimum details must be provided in the manual:

- i. About Photovoltaic
- ii. About Solar Power Plant-its components and expected performance
- iii. About PV Module. In case of imported modules it is mandatory to provide a copy of the international product qualification certificate to the test centre.
- iv. About PCU/Inverter. The make, model number and technical characteristics of PCU/ Inverter should be stated in the product datasheet and furnished to the test centers
- v. Clear instructions about Mounting of PV Module(s)
- vi. About Electronics
- vii. About Charging and Significance of Indicators.
- viii. DO's and DON'Ts
- ix. Clear instructions on operation, Regular Maintenance and Trouble Shooting of SPP
- x. Name and address of the person or service center to be contacted in case of failure or complaint.

5.13. FIVE YEARS MAINTENANCE AND PERFORMANCE WARRANTEE CONTRACT (MPWC)

13.1 Preventive/Routine Maintenance

This shall include activities such as, cleaning and checking the health of the SPV Power plant, cleaning of module surface, tightening of all electrical connections, changing of tilt angle of module mounting structure and any other activity that may be required for proper functioning of the SPV Power Plant as a whole.

13.2 Breakdown/Corrective Maintenance

Whenever a complaint is lodged by the user, the bidder shall attend to the same within a reasonable period of time of 3days and in any case the breakdown shall be corrected within a period not exceeding 7 days from the date of complaint.

13.3 The bidder shall maintain the following facilities at the local Service Centre for ensuring highest level of services to the end user.



(U. CHOUDHURI)
District & Sessions Judge
South Tripura, Belonia.

1. Adequately trained manpower, specifically trained by the bidder for carrying out the service activities.
2. Adequate provisions for record keeping, which shall inter-alia, include the following:
 - (a) Details of system supplied within the command area of the service station including full name and address of end user, system and sub-system serial numbers and records of routine maintenance carried out (duly signed by the end user). These records shall include voltage, current, indicator charge, full glow, charge controller operation, electronics, etc.
 - (b) History record sheets of maintenance done.
3. Adequate spares and manpower for ensuring least downtime of an individual system.

6. Bidding Schedule

SR. No.	Name of the Item	Quantity	YES	NO
Scope of work for Design, Supply, Installation Commissioning & Maintenance of 7.50kWp Solar PV Hybrid (without Grid export) with Battery backup Rooftop Solar Power Plant At District and Session Judge Court South Tripura, Belonia				
1	Poly crystalline Solar PV Module of having 72 cells.(Make: Vikram/ Warree / Reputed make) (As per specification attached)	7.50kWp		
2	Hot dip galvanized MS Structures for mounting of 20 nos. SPV Modules with galvanization thickness of 80-85 micron. Suitable for holding total Solar PV module (As per specification attached)	01Set		
3	Supply and making of necessary concrete foundation column for module mounting structure. (As per specification attached)	L.S		
4	Power Conditioning Unit (PCU) 6.5kW Hybrid (Without Grid Export) Solar PCU Output AC: 230 V+ 10%/ 1 ,50Hz. (As per specification attached)	01Nos		
5	Battery Bank 120V (12V 150Ah each LMLA type)	01Set		
6	Cables & Wiring materials (As per specification attached)	L.S		
7	PV Array Junction Box (AJB) (As per specification attached)	01Nos.		
8	DCDB with switches and circuit breakers as per IEC 60947 Reputed make (Enclosure: MS Powder coated)	01Nos.		
9	ACDB with switches and circuit breakers as per IEC60947 Reputed make) (As per specification attached)	01Nos.		
10	Lightning arrestor and Earthing system. (As per specification attached)	1Set		
11	415V, 16 Amps Switch Fuse Unit	1Set		
12	Any others items required for successful operations of the Solar PV Power plant	L.S		
13	Annual Maintenance	2years		


 (U. CHOUDHARY)
 District & Sessions Judge
 South Tripura, Belonia

7. Price Schedule

SR. No.	Name of the Item	Quantity	Unit Rate (in INR)	Total (in INR)
Scope of work for Design, Supply, Installation Commissioning & Maintenance of 7.50kWp Solar PV Hybrid (without Grid export) with Battery backup Rooftop Solar Power Plant At District and Session Judge Court South Tripura, Belonia				
1	Poly crystalline Solar PV Module of having 72 cells.(Make: Vikram/ Warree / Reputed make) (As per specification attached)	7.50kW p		
2	Hot dip galvanized MS Structures for mounting of 20 nos. SPV Modules with galvanization thickness of 80-85 micron. Suitable for holding total Solar PV module (As per specification attached)	01Set		
3	Supply and making of necessary concrete foundation column for module mounting structure. (As per specification attached)	L.S		
4	Power Conditioning Unit (PCU) 6.5kW Hybrid (Without Grid Export) Solar PCU Output AC: 230 V+ 10%/ 1,50Hz. (As per specification attached)	01Nos		
5	Battery Bank 120V (12V 150Ah-LMLA type) Exide/ AMC /Reputed make (As per specification attached)	01Set		
6	Cables & Wiring materials (As per specification attached)	L.S		
7	PV Array Junction Box (AJB) (As per specification attached)	01Nos.		
8	DCDB with switches and circuit breakers as per IEC 60947 Reputed make (Enclosure: MS Powder coated)	01Nos.		
9	ACDB with switches and circuit breakers as per IEC 60947 Reputed make) (As per specification attached)	01Nos.		
10	Lightning arrestor and Earthing system. (As per specification attached)	1Set		
11	415V, 16 Amps Switch Fuse Unit	1Set		
12	Any others items required for successful operations of the Solar PV Power plant	L.S		
13	Annual Maintenance	5years		
14	GST			
15	Transportation			
16			ALL Total	


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 District & Sessions Judge
 South Tripura, Belonia.

Format for Submitting the Price Schedule

BID No. :

Date:.....

To
District and Sessions Judge,
South Tripura, Belonia

Price

Schedule

Sl. No.	Item Details	Price in INR	
		Unit Price	Total Price
	Design, supply, installation & commissioning and 5 years maintenance of 7.50kWp Solar PV Hybrid (without Grid export) with Battery backup Rooftop Solar PV Power Plant at District and Session Judge Court South Tripura, Belonia as per the Bid Document including MPWC (5yrs) The price should be complete in all respect including taxes and duties, transportation, insurance, etc.		

Note:

Above quoted price for Solar PV Power plant are complete in all respect as per Technical Specifications inclusive of all taxes (GST) & duties, packing, forwarding, transit insurance, loading & unloading, transportation & other charges etc. For Belonia, Tripura, inclusive of installation, testing, commissioning, performance testing and training at Belonia, Tripura

1.Certified that rates quoted for Solar PV Power plant are as per specifications, terms & conditions mentioned in the bid document.

Yours faithfully,

(Signature of Authorized Signatory)

Name :

Designation:

Company Seal: