

## छावनी परिषद् अजमेर / CANTONMENT BOARD, AJMER

पलटन बाज़ार, अजमेर, राजस्थान - 305001 / PALTAN BAZAR, AJMER, RAJASTHAN - 305001

दूरभाष/Phone:0145-2420592

ई-मेल/E-Mail: [ceoajme-stats@nic.in](mailto:ceoajme-stats@nic.in)

वेबसाइट/Website:<https://ajmer.cantt.gov.in/>

पत्रांक: III/15/CAC/SOLAR/Vol-I/127

दिनांक : 04 August, 2022

### TENDER DOCUMENTS

01. Cantonment Board, Ajmer invites e-tender through Defence e-Procurement for the following Term Contract for “Design, Drawing, Supply, Installation and Commissioning of Total 20 KWp Rooftop Solar PV Power Plant at Office Campus of Cantonment Board, Ajmer” from the Manufacturer / Research Institute Authorized Distributors / Dealers / Accredited retailers / Approved contractors having similar kind of work experience with approval of MNRE through Defence e-Procurement Portal. The tenderer can quote their rates through Defence e-Procurement on fulfillment of terms / conditions / requirement within stipulated time period prescribed by the Board, which can be seen in the Office of the Cantonment Board, Ajmer on any working day and official website of Cantonment Board, Ajmer i.e. <https://ajmer.cantt.gov.in/> and on the website <https://defproc.gov.in/nicgep/app/>. Preference will be given to Research Institute / NGO / MSEs.

Sr. No	Name of work	Estimate Cost	EMD	Period of Contract	Tender fee
01.	Design, Drawing, Supply, Installation and Commissioning of Total 20 KWp Rooftop Solar PV Power Plant At Office Campus of Cantonment Board, Ajmer	Rs. 15,00,000/-	Rs. 30,000/-	Work Completion - 120 Days Maintenance of Project - 05 YEARS	Rs. 2000/-

**NOTE: Tender sets free of cost and exemption from payment of earnest money to registered MSEs.**

S.No.	Activity	Date	Time
1.	Date and time for publishing and download start of tender documents	06-08-2022	10:00 hrs
2.	Online submission of bid start	06-08-2022	10:00 hrs
3.	Last date and time for bid / documents submission	30-08-2022	11:00 hrs
4.	Tender opening date and time	31-08-2022	11:00 hrs

02. (i) The Bidder is bound by all rules and regulations fixed by the Board and any violation may invite forfeiture of his Security Money / Earnest Money Deposit.
- (ii) No conditional tenders will be accepted.

03. Each bidder shall have to upload scanned copies of following documents with duly filled technical bid proforma & index of documents.
- (a) Last two-year Income Tax returns upto dt. 31.03.2022 (alongwith computation).
  - (b) Latest bank statement of one year upto 31.03.2022.
  - (c) Tax payer's identification Number (GSTIN).
  - (d) PAN Card.
  - (e) Self declaration certificate regarding not Debarred / Black listed in any government department for any work in form of affidavit on Rs. 50/- non-judicial stamp.
  - (f) Minimum 05 Projects experience certificate of Solar PV Power Plant work to be submitted by firm as per the Govt. Departments / PSU / Semi Government / Autonomous Body / Private.
  - (g) Scanned copy of receipt of tender fee Rs. 2,000/- (Non-Refundable) through e-Chhawani Portal and for MSEs the 'Udyog Aadhar Registration Certificate' should enclosed.
  - (h) Scanned copy of receipt of Earnest Money Deposit Rs. 30,000/- through e-Chhawani Portal and for MSEs the 'Bid Security Declaration' must be enclosed.
  - (i) Scanned copy of receipt of Registration Fee (non-refundable) through e-Chhawani Portal. The Registration Fee Rs. 5,000/- for new vendor and Rs. 2,000/- for renewal of registration.
  - (j) Annexure of Technical particulars (enclosed at last).

**NOTE: Tender sets free of cost and exemption from payment of earnest money to registered MSEs. Registered MSEs must be enclosed Udyog Aadhar Registration Certificate and Bid Security Declaration.**

04. Tender document indicating full details of the tender is available at Portal address <https://defproc.gov.in/nicgep/app/> and shall be submitted through Defence e-Procurement only. The bids will not be accepted in any other form. Bidders are advised to get themselves acquainted with the requirement for e-tendering at Portal mentioned above. Clarification needed, if any may be obtained from the Office on any working day from Engineering Section of Cantonment Board, Ajmer.
05. E-bids shall be submitted in two bid system as follows:-
- a) Technical e-bid &
  - b) Financial e-bid
06. Tender documents duly completed in all respect containing Technical Bid along with all the documents mentioned in Para-03 and the Financial bid (separately) to be uploaded (in English Only) at portal mentioned above positively. Each page of documents submitted with the Technical Bid should be signed and stamped by the authorized representative of the Bidder.
07. A copy of the receipt of the payment made is to be uploaded with the technical bid of tender of documents at the time of submission. Non-submission of Tender Fee / Firm registration fee and EMD shall lead to disqualification.
- (a) Financial Bids of Technically qualified bidders only will be opened.
  - (b) **Cantonment Board, Ajmer reserves itself the right to extend the date of receiving / opening of the bids.**

08. The opening of the Financial Bids shall be done only after the evaluation of technical bid in due course.
09. **Cantonment Board, Ajmer reserves to itself the right to reject any tender without assigning any reason thereto.**
10. Cantonment Board, Ajmer is not responsible for any postal delay or any link failure / internet problem etc. in respect of submission / receipt of any documents or in submission of e-bid. It is the responsibility of the Bidder to make sure that the required documents / e-bid is submitted in time and to ensure hard-copy submits in Cantt. Board Office on or before the last date submission of Tender.
11. All bidders have to submit the Firm registration fee, Tender Fee and EMD separately in the office of Cantt. Board Ajmer on or before the last date of on-line submission of bids through e-Chhawani Portal.
12. The bidder is solely responsible for submission of Firm registration fee, Tender Fee and EMD, non-submission will lead the disqualification.
13. Cantonment Board, Ajmer / Chief Executive Officer, Cantonment Board, Ajmer is reserve the right to postpone and / or extend the date of receipt of opening of tenders or to withdraw the tender notice, without assigning any reason thereof. In such cases the bidders shall not entitled to any form of compensation from the Cantonment Board, Ajmer.
14. **NO MANUAL BID WILL BE ACCEPTED.**

**Sd/---**

**Chief Executive Officer    मुख्य अधिशाषी अधिकारी**  
**Cantonment Board, Ajmer    छावनी परिषद, अजमेर**

## **GENERAL CONDITIONS OF CONTRACT**

1. The estimated cost of the work will serve as an approximated guide and it may be increased or decreased to the tune of 10% at the discretion of the Board / CEO and tenderer shall have no claim on that account.
2. Tender will be submitted on prescribed format which is available at portal address <https://defproc.gov.in/nicgep/app/> along with scanned copy of e-Chhawani transaction receipt. The Earnest Money Deposited by the contractor pledged to the Chief Executive Officer will be forfeited if the successful tenderer fails to deposit performance guarantee / security money and execute contract agreement within the stipulated time. In case of failure on his part a penalty of Rs. 100/- for each day of default shall be final and binding on the tenderer, besides such other action which President Cantonment Board / Chief Executive Officer, Cantonment Board, Ajmer may like to take.
3. The Cantonment Board, Ajmer is not bound to accept to lowest or any tender or to give any explanation for not accepting the lowest tender and will reserve the right at any time after the acceptance of a tender to keep back the tender from the contractor. The Board / undersigned also reserve the rights to accept the tender in part for any of the item or works.
4. Tenders submitted by persons who are in any way indebted to the Board will not be entertained, and the scanned copy of last two year Income Tax return should be enclosed along with the tender. In case the contractor fails to enclose two years income tax return as stated above the tender submitted by the contractor shall not be considered.
5. The amount of security / performance guarantee to be deposited by successful tenderer for the due performance of all the conditions of the contract shall be the sum equal to 03% through Demand Draft / Fixed Deposit Receipt / Bank Guarantee / through e-Chhawani, the security / performance guarantee so deposited will only be refundable after maintenance period of 12 months from the date of satisfactory completion of the supply / work.
6. The contractor should be very careful in quoting the rates as once a tender is accepted no representation with a view to reducing the same will be considered.
7. The supply has to be completed by the contractor within the period specified in the work order. If the contractor fails to complete the work and clear the site on or before the date fixed for the completion the Chief Executive Officer without prejudice, shall be at liberty to impose fine @ 01% of the contract value for every week on the contractor subject to maximum 10% of contract value.

If such failure of negligence continues for a period of more than one month from the date of imposition of fine the Chief Executive Officer shall be at liberty to cancel the contract entirely and get balance work done by any other agency at the risk and cost of the contractor.

10% of the contract amount shall be imposed as fine in case of cancellation of contract mentioned above.

The decision of the Board / CEO shall be final, binding and conclusive on the contractor.

8. The accepting authority (Cantonment Board, Ajmer) shall have the right for rejecting any or all of the tenders without assigning any reasons.
9. The final bill together with completion certificate obtained from the Chief Executive Officer on completion of work / supply shall be submitted within one month from the date completion of the supply.
10. No further claims shall be submitted by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished.
11. No liability shall be incurred by the Cantonment Board nor shall the acceptance of a tender considered binding until the final contract documents have been signed by the authority competent and the contractor.
12. Terms of the contract will be strictly enforced and no excuse will be considered for incompleteness of work especially if such excuse is based merely on fact that the work is not profitable to the contractor any pandemic.
13. These tender documents shall on acceptance of a tender be attached to and be deemed to form part of the contract documents.
14. The rates if any should be filled in both the figures and in words clearly. No special rate will be accepted. Corrections in tender shall be initialed. Conditional, incomplete and unsigned tender shall be rejected. All pages of tender documents shall be signed by the tenderers. In case of variation of rates written in figures and in words the lower of the two shall be considered.
15. Any information regarding the design, supply, installation & commissioning Rooftop Solar PV Power Plant i.e. its condition and draft agreement etc. can be obtained from the Junior Engineer (Civil) on any working day.
16. The quantities and drawings are liable to alteration by the Chief Executive Officer / Cantonment Board, Ajmer according to actual requirement at supply site before or after acceptance or during the progress of the work whenever necessary but the rates offered by the contractor will not be altered. The contractor shall be bound to carry out the work accordingly and shall not be entitled for any compensation.
17. Except otherwise specified in the contract the Chief Executive Officer, Ajmer shall be the sole deciding authority on all questions relating to the meaning of the specification, designs, drawings and instructions herein before mentioned.
18. Any tender which proposed alteration to any of the conditions specifications laid down in the tender documents or any new condition what-so-ever, is liable to be rejected.

19. It is strictly for-bidden to modify or change of any or all the tendered condition.
20. In the event of tender being submitted by a firm it must be signed separately by each member thereof, in the event of the absence of any partner it must be signed on his behalf by a person holding a legal power of attorney / authorizing him to do so.
21. Defective supply pointed out by the Chief Executive Officer / Junior Engineer (Civil) will be removed by the contractor within the time specified at his own cost and risk. In case of failure on part of contractor the Security Deposit will be forfeited and firm will also be blacklisted.
22. The quantities given in schedule are approximate only and the contractor shall not be entitled to claim any compensation of any error in them. He must make his own calculations of the quantities of material required.
23. In case of any dispute arising out this tender the decision of the Cantonment Board, Ajmer shall be final.
24. The contractor must write their correct and complete address in tenders and arrange to take delivery of all letters. If any letter sent through registered post is received back undelivered it will be contractor's own responsibility and contractor shall be bound for action as required through the contents of such letter.
25. Maintenance period of the supply shall be one year from the date of satisfactory completion of the supply order during which the contractor, shall be responsible to make any defect good that are notified, in writing to the contractor by the Chief Executive Officer within the time allowed by the Chief Executive Officer. In case the contractor fails to comply with the order, steps for forfeiting the EMD/Security Money and blacklisting of the firm will be processed.
26. The contractor shall make their own arrangement for transport of labour, materials equipment's and machinery whenever necessary. In this regard it shall be the responsibility of the contractor to follow all the existing rules and acts with respect to labour wages etc.
27. The contractor shall be present (in person or by the representatives) on the site to receive or carry out the instructions from the Chief Executive Officer or Junior Engineer (Civil) and not subject work without written permission.
28. The measurement will be taken by the Junior Engineer (Civil) [official in-charge of the work(s)]. The contractor or his authorized agent is to be present when measurement are being taken and will sign the Cantonment Board measurement recorded, a notice to this effect shall be made in the measurement books and shall be signed dated by both and parties on the same day as the measurement are taken.
29. The contractor agrees that the contract shall not be terminated by the contractor, but the Board reserves, the right to do so on failure of the contractor to carry out the work in accordance with the specifications and plans or commits any breach of the conditions of the contract.

30. The contractor will commence the work within 10 days from the date of receipt of work orders.
31. The contractor will be paid his dues under the on submission of final bill unless the Cantonment Board for any reasons find it necessary to postpone the payment. However contractor submit running payment bill, the payment of running bill shall be made after measurement recorded in measurement book by Junior Engineer (Civil).
32. In case of extension of time for completion of work is requested by the contractor due to some reasons, the Chief Executive Officer, Cantonment Board, Ajmer shall grant the same without or with a token penalty or maximum fine imposition up to 0.10% of the cost of remaining work per month.
33. The contractor shall be liable to pay minimum wages as per the minimum wages act and will be answerable to the competent authority under rules made hereunder. The contractor shall be liable to follow all the concerned provisions of the Minimum Wages Act, Workmen's Compensation Act, Child Labour (Prohibition) and any other Acts / Rules as may be applicable.
34. All liabilities arising out of if, unfortunate accident or death while on duty shall be borne by the Contractor.
35. The contractor shall carry out the work(s) entrusted to him in accordance with the specifications to the entire satisfaction of the President Cantonment Board / Chief Executive Officer on the report submitted by the Junior Engineer (Civil) in this regard, and shall complete the same within stipulated time i.e. 120 days from the date of work order. In case if the work entrusted is not carried out to the satisfaction of President Cantonment Board / Chief Executive Officer the contract can be terminated by giving 30 days' notice in writing to contractor. In such case the security amount will be forfeited. Further if the quality of work found poor or not in accordance with specification the contractor will be black listed.
36. If any damage is cause to the Govt. property by the firm / contractor by mistakes / lapse, the same will be compensated by bill / security deposits of the concerned firm / contractor.
37. The work for which the work order is issued will have to be completed within the time as specified in the work order.
38. The tenders submitted by post or any other offline method will not be entertained.
39. The terms and conditions of the tender notice shall also form part of agreement.
40. The rate quoted shall be inclusive of all taxes and all kinds of duties and Octroi / LBT / VAT / GST or any other tax levied by the government, all complete. The accepted contract value must be Firm till the completion of works.
41. All the materials use only Indian Standard (ISI).

42. Deduction of Income Tax and Sale Tax as per Govt. Rules.
43. **THIRD PARTY QUALITY CONTROL:** In order to achieve best workmanship and execution of quality works the Cantonment Board, Ajmer may engage an independent agency who will carry out independent testing of materials and checking and ensuring overall quality procedures. The contractor shall be required to fully co-operate with agency and facilitate them to take samples, transportation and examination of various activities including documentation at no extra cost to the Board. In case of any adverse findings by the third party inspecting agency, the contractor shall do the needful rectifications at no extra cost to the Board. The cost towards consultancy / third party quality control to the institutes would be paid by the Board. All bill payment would be subject to third party quality control verification.
44. **MATERIALS AND SAMPLES:-**
- (a) The contractor shall produce design, drawing, supply and commissioning of all materials, articles, fittings; accessories etc. are approved certified by MNRE. Sufficiently in advance that he process to use and get it approval in writing by the Chief Executive Officer.
45. **SIGNING OF CONTRACT DOCUMENT :-**
- The person signing the tender on behalf of another or on behalf of a firm shall attach with the tender a proper power of attorney duly notarized executed in his favour by such only person or by all the partners stating that he has authority to bind such other persons or the firm as the case may be in all matters pertaining to the contract including the arbitration clauses. In case of proprietorship concerns the signatory of the tender documents shall enclose a certificate of an affidavit stating he is sole proprietor of the concern firm.
46. All entries by the tenderers should be in one hand. Erasures and overwriting are not permissible. However, all corrections and overwriting should be signed by the tenderers. All pages of the tender document shall be signed by the tenderer.
47. Conditional, incomplete, unsigned or un-witnessed tender are liable to be rejected.
48. In case of firms, tender must be signed by each partner or member or by the person holding the legal power of attorney on behalf of other partners / members of the firm. In the latter case, a copy of the power of attorney attested by Gazetted officer must accompany the tender.
49. **PERIOD FOR KEEPING TENDER OPEN :-**
- The tender shall remain open for acceptance for a period of **90 days** from the dates specified for its submission excluding the date of submission.



50. **SECURITY OF CLASSIFIED DOCUMENTS :-**

The contractor shall not communicate any classified information regarding the work either to sub-contractor or others without prior approval of the Chief Executive Officer in writing. Subletting of contractor shall not be permitted.

51. No repayment will be made to the contractor, for damage caused by rains, or other natural calamities during the execution of the supply and no such claim on this account will be entertained.

52. **DATE OF START AND PERIOD OF COMPLETION :-**

Date for commencement of supply / installation on site - 120 Days (from date of issue of supply / work order). In case the contractor fails to commence the work within 120 days of issue of supply / work order the Chief Executive Officer / Cantonment Board, Ajmer will be at liberty to impose fine of Rs. 1000/- per day in the first week. In case the reason for delay is not satisfactory the Chief Executive Officer / Cantonment Board, Ajmer could impose penalty and the contractor have to abide. The Chief Executive Officer will be at liberty to cancel the supply / work order if supply / installation is not commenced within 120 days of issue of supply / work order and the matter would be referred to the Board for further necessary action against the contractor. Cancellation of supply / work order may lead to forfeiture of EMD / Security Money & blacklisted of firm by the Board.

**NOTE: Tender sets free of cost and exemption from payment of earnest money to registered MSEs.**

**Sd/---**

**Chief Executive Officer    मुख्य अधिशाषी अधिकारी**  
**Cantonment Board, Ajmer    छावनी परिषद, अजमेर**

# **TECHNICAL SPECIFICATION FOR 20 KWp**

## **ROOFTOP SOLAR PV POWER PLANT**

1. Design, Drawing, Supply, Installation & Commissioning 20 KWp Rooftop Solar PV Power Plant at Office Campus of Cantonment Board, Ajmer.
2. The Solar Power Plant comprises of following equipment :-
  - i. Solar PV Module / Panel
  - ii. Solar Power Conditioning Unit with Grid Tie Inverter
  - iii. Mounting array structures and allied accessories
  - iv. Solar Junction Boxes / Connectors
  - v. Solar Cables / Wires & other accessories
  - vi. Lighting Projection
  - vii. Earthing system
  - viii. Net Meter system
  - ix. Liaisoning with TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer for inter connection

### **DETAIL SCOPE OF WORK:-**

#### **a. Solar PV Module / Panel : Made in India :-**

Good quality mono-crystalline half cut sell high power cells shall be used in Solar PV Module. To connect the Solar Module Interconnection cable shall be provided. Photoelectric conversion efficiency of SPV Module shall be greater than 14.9%. Module shall have butyl rubber edge sealant for module protection. Module shall withstand upto 200 KM/hr from backside of the panel. The module shall be approval by CEO approval. The module frame is made of corrosion resistant material, which is electrolytic ally compatible with the structural material used for mounting the module. Weather resistant module junction box shall be designed for long life and outdoor operation environment. A minimum warranty of 10 years shall be given with degradation of power generated not exceeding 10% over the entire 10 years period. In addition to that 25 years linear output warranty shall be offered. Data sheet of the offered module shall be submitted.

#### **Technical specification of Solar PV Module:-**

Nominal Max Power	-	325W – 335 W
Optimum Operating Voltage	-	37.1V – 46.6V
Optimum Operating Current	-	8.63 A – 9.5A
Open Circuit Voltage	-	46.2 V
Short Circuit Current	-	9 A
Module Efficiency	-	16.53
Operating temperature	-	100C to +850C
Max. System Voltage	-	1000 V
Max. Series Fuse	-	20 A
Power Tolerance	-	+/- 3%
Cell Arrangement Poly	-	crystalline 72

Weight	-	22 Kg or above
Front Cover	-	3.2 Tempered glass
Frame material	-	Anodized aluminum alloy
J-Box	-	IP 67, 3 diodes
Cable	-	4mm <sup>2</sup> , 1000 V
Connector	-	MC 4
Quantity	-	as per site requirement

The technical specification of module is indicative however selection of module is as per design to fulfill the desired capacity. The modules shall be fixed on corrosion resistant **GI / MS structure**.

» **Warranty:-**

A minimum warranty of 10 years shall be given with degradation of power generated not exceeding 10% over the entire 10 years period. In addition to that 25 years linear output warranty shall be offered. Data sheet of the offered module shall be submitted.

- » Test reports from Indian government accredited test lab & Data sheets should be submitted along with bid.

- » **Quantity:-** As per site requirement.

**b. Solar Power Conditioning Unit with Grid Tie Inverter: 20KW 3-phase Grid Connected String Inverter with Zero Export Feature-Preferable Made in India:-**

3-phase grid connected IGBT based pure sine wave inverter shall convert DC power produced by SPV Array and adjust the voltage and frequency levels to suit the grid. It should have the feature of zero export; all three phases shall be supervised to rise/fall in with respect to programmable threshold values of frequency and power section of the plant.

The plant shall get disconnected/connected in case of grid fault/after normal grid condition have resumed. The grid supervision must comply with relevant/equivalent regulations. The array electrical configuration shall be such a way that the Maximum Power Point Tracking (MPPT) shall operate with maximum efficiency, between low and high temperature of the site. Disconnection of the PV Generator in the event of loss of main grid supply is achieved by in built protection. In the morning inverter will wake up from sleep mode, the control system continuously monitors the output of the solar generator until preset value is exceeded (Typically 10 Watt). Inverter gets automatically synchronized with grid by adjusting its output voltage and frequency to match with grid values. The number of inverters shall be such that it should handle 20 KWp power generations.

- » Technical specifications of 3 phase Inverter :-

» **Input DC :-**

Max. DC Power	-	24000 W
Max. DC Voltage	-	1000 V
MPP Voltage range	-	250 to 950 V

DC Nominal Voltage	-	800 V
Min. DC Voltage/Start Voltage	-	150 V/ 188 V
Max. Input Current per string	-	35 A
No of MPP tracers	-	as per site requirement
<b>» Output:-</b>		
Output AC & AC Power (@230V 50 Hz)	-	21000 W
Nominal AC Voltage	-	3 Ph/N, 250/440 V
AC Output Grid range	-	150v-280v
AC Grid frequency	-	50+1.5 Hz, -3.5 Hz
Output Current	-	50 A
Power factor	-	0.8 leading/0.8 lagging
Max. Efficiency	-	98%
<b>» Protection:-</b>		
DC Reverse polarity/ Reverse current protection		
Electronic Static Switch disconnect		
AC Short Circuit Protection		
Ground fault Monitoring		
Grid Monitoring		
All pole sensitive fault Current Monitoring		
String failure detection		
<b>» General Data:-</b>		
Operating temperature	-	100C to +600C
Topology	-	Transformer less
Cooling Highly Efficient	-	Natural cooling system
Protection rating	-	IP 65
<b>» Features:-</b>		
DC connection	-	DC plug system
AC connection	-	Spring type terminal
Display	-	Graphic
Interfaces	-	RS 485
Warranty	-	05 years
Certificates	-	IEC from Indian test lab:

The technical specifications of 3-phase Grid Connected String Inverter are indicative however selection of 3-phase Grid Connected String Inverter is as per design to fulfill the desired capacity.

- » Instantaneous Display
- » Universal AC input
- » Graphic display where parameters can be changed as per the requirement
- » Real time clock
- » Automatic backup to prevent data loss

- » Compatible with RS232 & RS485 & multiple interface
- » Wi-Fi & GSM based monitoring system
- » Whether station interface
- » RJ45 Ethernet socket
- » Alarm notification through SMS & Mail
- » Data logging for more than 03 years
- » Ground/ Wall mounted or stand alone with frame supporter

Instantaneous & Logging Parameters: Per phase KW, per phase Voltage, per phase PF, System, Frequency, Inverter KWh summation, Time & Date Stamped On control panels of inverter the Digital type ammeter / Volt meter both in the input & output side should be provided. Inverter shall have arrangement of adjusting DC input current & should trip against sustainable fault in the LT.

» **Warranty:-**

A **minimum warranty of 07 years** shall be given one spare components for fast service back up.

- » Test reports from Indian government accredited test lab & Data sheets should be submitted along with bid.

**c. Solar Junction Boxes / Connectors :-**

The Junction boxes will be of dust, vermin and waterproof and made of ABC/ Thermo plastic. The terminals will be connected to copper bus bar arrangement of proper sizes. Suitable markings should be provided on the bus bar and cable ferrules shall be fitted at cable termination points for identification. It should have arrangement for connection and disconnection of sub arrays group. Test point for each group shall be provided for quick fault location. The rating of JB's shall be suitable with adequate safety factor to inter connect the solar PV array. It should be IP 65/ IP 66 compatible.

**Quantity:-** As per site requirement.

**d. Mounting array structures and allied accessories:-**

The mounting array structure will have MS-L channel ISI from standard make, galvanized and with manual tracking system made in SS hardware. All fasteners, nut bolts and supporting structures shall be of SS or GI. The array structure will be made of hot dipped GI and the minimum thickness will be as per IS 1461. The minimum cleared of the lowest part of module structure and developed ground level will not be less than 500 mm. The SPV panel array will be mounted facing to south and tilted to an angle to latitude where being used for optimum performance.

**e. Solar Cables / Wires & other accessories :-**

The solar cables should be selected such that there should be minimum voltage drop and they should be capable to withstand direct sunlight, high temperature and direct exposure to weather

changing conditions and these cables must be double insulated and polarized to sustain arching of contacts of solar array. The wiring size of PV array will be designed such that maximum voltage drop at full power from PV modules to the inverter will be less than 3%. The wiring for module interconnection will be with hard PVC conduit.

- » All LT power cables shall be of 1.1 KV grade, Aluminum conductors, with steel armoring. These cables shall be laid on structure support and using galvanized cable tray of adequate strength. Cable shall be terminated using Al. lugs of adequate cross section area.
- » Control cables shall be of 1.1 KV grade, copper conductor, PVC insulated, steel armored. These cables shall be laid on structural support and using galvanized cable tray of adequate strength. Cable shall be terminated using Copper lugs for adequate cross section area.
- » Only copper conductor cable of reputed make shall be used in DC side of plants between interconnection of modules, junction boxes, PCU, LT interfacing panel/DC panel and other associated equipment.
- » Cables of appropriate size are to be used in system and shall have following characteristics.
- » Shall be conforming to IS 694/1554 standard.
- » Temperature range – 10 degree + 80 degree
- » Quantity: As per site requirement and it includes cable from Ground Mounted/ rooftop of building up to the PCC/MCC room of the building and up to electricity meter point.

**f. Lighting & Over Voltage Protection:-**

The Solar PV power plant shall be provided with lighting and over voltage protection both for the PV panels and the PCU.

- » SPV power plant shall be provided with lightening and over voltage protection connected to proper earth mats.
- » Lighting masts / conductor shall be made as per applicable Indian Standard / International Standard in order to protect entire Array from lighting strike.
- » Lightning masts/conductor shall be earthed through flats and connected to Earth mats as per applicable Indian Standards with earth pits. Each Lighting Conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using BFC Earthing chemical compound as per required provisions of IS.

### **3. Earthing system for Array yard:-**

Each array structure of Solar PV power plant shall be grounded as per IS standards. The complete earthing system shall be mechanically and electrically connected to provide independent return to earth. All equipment shall have two distinct earth connections. Earth array structure of SPV plants shall be grounded properly. Array structure are to be connected to earth pit as per IS standard. Junction boxes shall be connected to main earthing conductor or electrode. Earthing system installation shall be in strict accordance with the latest edition of Indian Electricity Rules, relevant Indian Standard stand Code of practices for earthing and local statutory authority regulation. Neutral point of system, metal lice closure sand frame work, not forming part of electric supply shall be connected to main earthing system. Necessary test point provision shall be made for bolted isolation joint of each earthing pit for periodic checking of earth resistances. In compliance to rule 33 and 61 of Indian electricity rule, 1956 (as amended update) all non-current carrying metal part shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode. Earth resistance of earth pits shall be tested.

### **4. Net Meter:-**

Appropriate size of net meter is to be installed as per specifications and norms of TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer. It should be calibrated and approved by TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer. The net meters shall be approved makes of TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer. Net meter should be able to record minimum and maximum generation of solar power plant. There will be net meter for Patel Garden and connection of net meter with solar power plants 03-Phase connections shall be established. Net meter should be as per TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer and all the drawing & laisioning would be done by the supplier with final test report.

### **5. Liaisoning with TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer for inter connection & Electrical Inspector:-**

It is required to liaison with TP Ajmer Distribution Limited, Ajmer / AVVNL, Ajmer and AE / Electrical Inspector Office for necessary and mandatory approvals from these agencies for installation and operation of Rooftop solar PV power plant.

### **6. SPV power plant – Conditions for Design Engineering, Manufacturing, Installation, testing and commissioning :-**

1.1 Following codes and acts with its latest amendments shall be applicable for this project:-

- 1.1.1 Indian Electricity Act, 2003 with amendments thereto if any.
- 1.1.2 Indian Electricity Rules, 1956.
- 1.1.3 CEA Regulations, 2010.
- 1.1.4 American Society of Testing of Materials (ASTM Codes).
- 1.1.5 Other approved standards and / or Rules and Regulations related to the subject matter of tender.

1.2 Design, materials and workmanship shall satisfy the applicable standards, specifications and codes as per tender conditions & specifications and as applicable for SPV power plant.

1.3 Scope of work as described in tender document is not limiting in so far as the responsibilities of Bidder is concerned and shall include, carrying out all works and providing all facilities that are required for completion of SPV power plant project, complying fully with all requirements as envisaged, complete in all respect and satisfying all Performance and guarantee requirements as stated or implied from contents of tender document. Bidder shall make all required liasoning with all agencies concerned and also with concerned power utilities for interconnection of SPV power plant with the local grid, so as to commence utilizing power generated on commissioning.

1.4 Total responsibility in regard to design engineering, manufacturing, delivery at site, timely execution, including commissioning, guarantee obligations of contractor.

1.5 It shall be entirely Bidder's responsibility to provide, operate and maintain all necessary construction equipment, scaffoldings and safety gadgets, lifting appliances, tools and tackles to perform the work in efficient manner and to complete all jobs as per time schedule.

1.6 Bidder shall take all necessary precautions to prevent fire/ damage to property in the area of his operations and he shall be responsible to make good any damage caused.

**7. SPV power plant- Conditions for Maintenance Contract (MC) :-**

- i. Bidder shall be responsible for Maintenance of SPV power plant for a period of 05 years from the date of commissioning.
- ii. Bidder shall perform Maintenance Work in an efficient manner and in accordance with:
  - (a) Systems designers and manufactures specifications, Annual Operating Plan for Solar Plant and all operation and maintenance manuals.
  - (b) Prudent Utility Practices
- iii. Bidder shall carry out following prior to commencement of MC:
  - (a) Provide services and personnel set forth in Mobilization Plan
  - (b) Prepare Annual Maintenance Schedule
  - (c) Develop and implement plans and procedures including those for maintenance the planning, procuring and inventory control of stores and spares, plan to meet emergencies, plant safety and security; and such other facilities and systems as may be necessary.
  - (d) Regularly update and implement equipment repair and preventive maintenance program to meet specifications of equipment manufactures and recommendations of manufacturers.
  - (e) Provide technical & engineering support for resolving operation and maintenance problems.

**Sd/---**

**Chief Executive Officer** मुख्य अधिशाषी अधिकारी  
**Cantonment Board, Ajmer** छावनी परिषद, अजमेर



## **TECHNICAL PARTICULARS**

There are requirements for the equipment under this tender :-

General requirement 20 KWp Rooftop Solar PV Power Plant at Office Campus of Cantonment Board, Ajmer

### **ANNEXURE 1 (UPLOAD IT ONLINE IN TECHNICAL BID)**

<b>SR. NO.</b>	<b>DESCRIPTION</b>	<b>CONFIRMATION YES / NO</b>	<b>DEVIATION IF ANY</b>
1.	Bids must be complete with all equipment and required accessories along with necessary mounting arrangement of fitting and hardware, lugs, tools and machinery etc. as required for complete installation of 20 KWp Rooftop Solar PV Power Plant at Office Campus of Cantonment Board, Ajmer.		
2.	The certificates relating to the solar panel and allied accessories issued from MNRE and other testing laboratories enclosed.		
3.	Authorized letter from OEM certifying that the equipment and system supplied by the bidder are in production and would be supported for service for at least minimum next 05 years, from the date of commissioning enclosed		
4.	All the equipment of external fitting should be IP-65 / NEMA-4 complied and vandal proof. The Cables should be Polycab / Finolex / Vimal / Havells		
5.	Bidder must provide reference list for satisfactory installation of similar works / components of Rooftop Solar PV Power Plant.		
6.	The warranty should consist of repairing or replacing defective parts, and all other assistance for proper functioning of the project for a period of 05 year From the date of installation of system irrespective of individual item warranty.		

Signature of Contractor  
(with official seal)

**(FORMAT OF BID SECURITY DECLARATION TO BE SUBMITTED ON LETTER HEAD OF  
THE FIRM / AGENCY DULY STAMPED & SIGNED)**

To,

The Cantonment Board, Ajmer  
Ajmer Cantt.

**BID SECURITY DECLARATION**

Bid / Tender reference No. \_\_\_\_\_ of Cantonment Board, Ajmer under  
Ministry of Defence.

I / We, the undersigned, declare that:

01. I / We understand that, according to existing rules / regulations, bid must be supported by a Bid Security, which is being submitted in the form of this Bid Security Declaration.

02. I / We accept that:

I / We may be blacklisted / disqualified / debarred from bidding for any contract in any Central Government Ministry / Department for a period of two (2) years,

I / We have committed any of the following actions:

(i) Withdrawn my / our Bid during the period of bid validity required in the Bidding Documents;

Or

(ii) Fail or refuse to accept the award or enter into contract in accordance with the Bidding Documents after having been notified as successful bidder.

03. I / We understand that this Bid Security Declaration shall cease to be valid on the following circumstances:

(a) Upon expiration of the bid validity period;

(b) I am / We are declared ineligible or disqualified upon receipt of your notice to such effect, and

04. I / We have furnished the performance security after declaration as successful bidder.

**AUTHORIZED REPRESENTATIVE OF THE FIRM**  
**(Signature / Stamp)**