

Tender No.: CREST/CTSPVPP/2022-23/01

Dated: 15.07.2022

BIDDING DOCUMENTS

FOR

**DESIGN, MANUFACTURE, SUPPLY, ERECTION,
TESTING AND COMMISSIONING INCLUDING
WARRANTY, OPERATION & MAINTENANCE FOR
10 YEARS FOR TOTAL AGGREGATE CAPACITY OF
2000kWp GRID-CONNECTED CANAL TOP SPV
POWER PLANT WITH HIGH POWER EVACUATION
ON HT SIDE AT N-CHOE PASSING NEAR GARDEN
OF CONIFERS, SECTOR - 52, CHANDIGARH**



**Chandigarh Renewable Energy and
Science & Technology Promotion Society
(CREST)**

(Under the Aegis of Department of Science & Technology
& Renewable Energy, Chandigarh Administration), 1st
Floor, Paryavaran Bhawan, Sector-19-B, Chandigarh. ☎
0172-2703982/2771919

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Name of the Work:

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.

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SECTION-A

TENDER NOTICE
CHANDIGARH ADMINISTRATION
CHANDIGARH RENEWABLE ENERGY AND SCIENCE & TECHNOLOGY PROMOTION SOCIETY

e-Tender Notice

e- Tenders are hereby invited by Chief Executive Officer, CREST from the manufacturers of SPV module/ System Integrators having specific experience of supply, installation, testing & commissioning of **SPV Power Plants** to be uploaded on the <http://etenders.chd.nic.in> in Three Bid System.

Scope of Work	Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.
Cost of tender documents	Rs.1,000/- plus 18% GST to be submitted along with EMD through Demand Draft Favoring CREST, payable at Chandigarh
Estimated Cost	Rs. 11.5 Cr (GST extra)
Earnest Money Deposit	Rs. 23 Lac (Favoring CREST, DD payable at Chandigarh/BG/FDR)
Time Limit	5 months from the date of placement of work order.
Pre Bid Meeting	21.07.2022 at 01:30 P.M. HYBRID Meeting (Both Physical and Online).Interested parties who wants to attend online Pre-bid meeting can send their queries via email on crestchandigarh@gmail.com on or before 11:00AM on 21.07.2022. Afterwards link for video conferencing will be shared for Pre-bid meeting
Downloading of e-tender Documents	Start Date 15.07.2022 At 1800 Hrs End date: 10.08.2022 upto 1700 Hrs
Date of Submission of e-Tender	Start Date 22.07.2022 At 1700 Hrs End date: 10.08.2022 upto 1700 Hrs.
Last Date for Submission of EMD, Cost of tender document, hard copy of Eligibility Documents required for Post-Qualification including signed and stamped copy of DNIT & all other necessary documents as uploaded in e-bid.	After 1700 Hrs. Dated 10.08.2022 up to 1200 Hrs. Dated 12.08.2022
Opening technical bid (Online)	Date: 12.08.2022 at 1230 Hrs.
Opening of Price-Bid.	To be intimated to all the Post-Qualified bidders separately.

CHECK LIST FOR BIDDERS FOR SUBMISSION OF TENDER

Sr. No.	<u>Documents Required</u>	<u>Submitted</u>
1.	Tender Document Fee	
2.	Earnest Money Deposit (EMD) as per Clause no. 3 on Page no. 15	
3.	Notarized affidavit on Indian non judicial stamp paper that bidder/ firm has never been blacklisted.	
4.	Undertaking on its letterhead that all the terms and conditions of the DNIT are acceptable to the Bidder.	
5.	Affidavit/ certificate from CA mentioning financial turnover of last three years.	
6.	Proof of execution of similar nature of work as per minimum SPV Capacity defined with copy of certificates of satisfactory completion and performance from an authority for which the work was executed including agreement amount, actual amount, date of start, date of completion.	
7.	Proof of experience of having successfully completed similar works during last seven years as per tender estimate cost criteria.	
8.	Authorization of the manufacturer of PCUs as per Performa attached.	
9.	Authorization of the manufacturer of SPV Module as per Performa attached.	
10.	Documentary proof for SPV modules being manufactured in India.	
11.	Technical Detail Form as per Performa attached.	
12.	Detail of service centre after sale of service equipment with telephone facility or Undertaking for opening of service centre after the placement of Work Order.	
13.	Submit a signed and stamped copy of the DNIT and all other documents duly signed and stamped as uploaded while submitting e-bid in the Tender.	
14.	The bidder should fill the cost break up form as per Performa attached and load it along with the financial bid.	

CPWD FORM NO. 8

CHANDIGARH ADMINISTRATION

**CHANDIGARH RENEWABLE ENERGY AND SCIENCE & TECHNOLOGY PROMOTION
SOCIETY**

STATE: UT, Chandigarh

(A) Tender for the work of: -

Name of the Work:

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant with High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.

DETAILS OF SITE

SR. NO.	SITE NAME	CAPACITY OF SPV POWER PLANT
1.	N-Choe near Garden of Conifers, Sector-52, Chandigarh	2000kWp
TOTAL		2000kWp

**(Chief Executive Officer)
CREST, Chandigarh**

TENDER

I/We have read and examined the Notice Inviting Tender, Schedule A, B, C, D, E & F, Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, Clauses of Contract, Special Conditions, Schedule of Rate and other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule 'F', viz. Schedule of Quantities and in accordance in all respects with the Specifications, Designs, Drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of Contract and with such materials as are provided for, by and in respects in accordance with, such conditions so far as applicable.

CPWD FORM NO. 8

We agree to keep the tender open for (90) Ninety days from the date of opening of financial bid and not to make any modifications in its terms and conditions.

A sum of **Rs. 23 Lac** is hereby forwarded has been deposited through Demand Draft/Bank Guarantee/Fixed Deposit Receipt (FDR) of a Scheduled Bank as earnest money. If I/we fail to furnish the prescribed Performance Guarantee within prescribed period, I/we agree that the said President of India or his successor in office shall without prejudice to any other right or remedy be at liberty to forfeit the said Earnest Money absolutely. Further, if I/we fail to commence the work as specified. I/we agree that President of India or his successors in office shall, without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the Performance Guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, upto maximum of the percentage mentioned in Schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2, 12.3 and 12.5 of the tender form. Further, I/We agree that in case of forfeiture of earnest money or both Earnest Money & Performance guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We hereby declare that I/we shall treat the tender documents, drawings and other records connected with the work as Secret / Confidential documents and shall not communicate information / derived there from to any person other than a person to whom I/we am/are may authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated Signature of Contractor
.....

Witness: - Postal Address: -

Address: -

Occupation: - **Telephone No.**

Fax:- E-Mail:-

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for a sum of Rs..... (Rupees.....)

The letters referred to below shall form part of this contract agreement.

i)
.....

Signature

ii)

iii)

iv)

Dated: -

**(Chief Executive Officer)
CREST**

SCHEDULE 'F':-

Reference to General Conditions of Contract

Name of the Work:

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.

- | | | |
|-------|--|---|
| 1.2 | Estimated Cost of work: - | <u>Rs.11.5 Cr (GST extra)</u> |
| 1.3 | Earnest Money: - | <u>Rs. 23 Lac</u> |
| 1.4 | Performance Guarantee | 3.00% of project capital cost. |
| 1.5 | Security Deposit | ----- |
| 1.6 | Time Allowed | 5 months for Part A
10 years for Part B |
| 1.7 | The following expressions shall unless the context otherwise require have the meanings hereby specifically assigned to them. | |
| 1.7.1 | Engineer in charge | Project Manager
Or Successor thereof |
| 1.7.2 | Superintending Engineer | Project Director

Or Successor thereof |
| 1.7.3 | Accepting Authority | Chief Executive Officer
CREST
Or Successor thereof |
| 1.7.4 | Delhi Schedule of Rates (DSR) | DSR-2012 with correction/amendments |
| 1.7.5 | CPWD Specifications | CPWD Specifications 2012 |

General Rules & Directions:-

Officer Inviting Tender: -

Chief Executive Officer
CREST

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2, 12.3 & 12.5

- | | | |
|-----|----------------------------|---|
| 8.1 | The order of preference: - | In the case of discrepancy between the Schedule of Quantities, the Specifications and/ or the Drawings, the following order of preference shall be observed:- |
|-----|----------------------------|---|

- (i) Nomenclature of item as per Schedule of Quantities.
- (ii) Special Conditions.
- (iii) Particular Specifications.
- (iv) CPWD Specifications.
- (v) Architectural Drawings.
- (vi) Indian Standard Specifications of B.I.S.

9 (ii) Standard CPWD Contract Form

CPWD Form 8 as modified and corrected upto 28.01.2012 with amendments as per **Section-III**.

Clause-1:-

(i) Time allowed for submission of Performance guarantee after date of issue of letter of acceptance

nil

(ii) Maximum allowable extension beyond the period as provided in (i) above

nil

Clause-2:- I. Authority for fixing compensation under clause-2.
II. Whether clause-2A shall be applicable.

**Chief Executive Officer
CREST**

No (In works with time limit More than 18 months.

Clause-5:- Time allowed for execution of work.

5 months for PART A
10 YEARS for PART B

Authority to give fair and

Appropriate clause of CPWD Work Manual 2012.

Reasonable extension of time For completion of work.

Mile Stone
Milestones

Refer Para (A) Table of

at **Sheet No.VI- 15**

Clause-6, :-

Clause 6 applicable

Clause applicable- (6)

Clause-7:- Gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment

NIL

Clause-10C:-

Component of labour expressed as percent of total value of work. 25%

Clause-10-CC:- Clause 10CC to be applicable in contracts with stipulated period of completion exceeding the period. Not applicable

Clause-11:- Specifications to be followed for execution of work C.P.W.D. Specifications

Clause-12:-

Clause-12(a) Accord sanction of substituted items. Appropriate clause of CPWD Works Manual 2012.

Clause 12(b) Accord sanction of extra items. -do-

12.2 & 12.3 Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work 30%

12.5 Deviation limit beyond which clause 12.2 & 12.3 shall apply for foundation works 100%

Clause-16:- Competent Authority for Deciding reduced rates. **Chief Executive Officer
CREST**

SCHEDULE 'F':-**Reference to General Conditions of Contract****Name of the Work:**

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.

1.2 Estimated Cost of work: - **Rs. 11.5 Cr (GST extra)**

1.3 Earnest Money: - **Rs. 23 Lac**

1.4 Performance Guarantee 3.00% of project capital cost.

1.5 Security Deposit -----

1.6 Time Allowed 5 months for Part A

10 years for Part B

1.7 The following expressions shall unless the context otherwise require have the meanings hereby specifically assigned to them.

1.7.1 Engineer in charge **Project Manager**
Or Successor thereof

1.7.2 Superintending Engineer

Project Director
Or Successor thereof

1.7.3 **Accepting Authority**

Chief Executive Officer
CREST
Or Successor thereof

1.7.4 Delhi Schedule of Rates (DSR)

DSR-2012 with correction/amendments

1.7.5 CPWD Specifications

CPWD Specifications 2012

Clause-36

Sr. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience	Number	Rate at which recovery shall be made from contractor in the event of non deployment.	
						Figures	Words
1.	Graduate Engineer OR Diploma Engineer Holder	Electrical/ Mechanical	Principal Technical Representative	2 Years	1 No.	Rs.20000/- per month	Rs Twenty thousand only per month.

SECTION - B

INVITATION OF BIDS

TENDER TERMS AND CONDITIONS

e-Tenders are hereby invited by Chief Executive Officer, CREST from the manufacturers of SPV module/ System Integrators having specific experience of supply, installation, testing & commissioning of **SPV Power Plants** to be uploaded on the <http://etenders.chd.nic.in> in Three Bid System.

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Downloading of e-tender Documents	Start Date 15.07.2022 At 1800 Hrs End date: 10.08.2022 upto 1700 Hrs
Date of Submission of e-Tender	Start Date 22.07.2022 At 1700 Hrs End date: 10.08.2022 upto 1700 Hrs.
Last Date for Submission of EMD, Cost of tender document, hard copy of Eligibility Documents required for Post-Qualification including signed and stamped copy of DNIT & all other necessary documents as uploaded in e-bid.	After 1700 Hrs. Dated 10.08.2022 up to 1200 Hrs. Dated 12.08.2022
Opening technical bid (Online)	Date: 12.08.2022 at 1230 Hrs.
Opening of Price-Bid.	To be intimated to all the Post-Qualified bidders separately.

1. The DNIT with detailed terms and conditions can be downloaded/Uploaded by the bidders from the website of Chandigarh Administration at <https://etenders.chd.nic.in>.
2. The tender document should be uploaded.
 - i) **Bid -1** : Shall contain Earnest Money along with cost of DNIT to be submitted in physical form upto 1200Hrs on 12.08.2022
 - ii) **Bid- 2** : Shall contain post qualification documents such as Annual Financial turnover and completion certificate of work & Technical Specifications
 - iii) **Bid -3** : The price bid for each item shall be uploaded separately.
3. The earnest money should be in the shape of Bank Guarantee (as per prescribed format and valid for min. 6 Months) / FDR (Fixed Deposit Receipt) / Demand Draft of any scheduled bank payable at Chandigarh in favour of the Chief Executive Officer, CREST, Chandigarh.
4. **The Bid -1** shall be opened on 12.08.2022 at 1230 Hrs. and the firm should upload the tender document upto 1700 Hrs. on 10.08.2022.
5. **The Bid -2** shall be opened only of Bidders whose earnest money found to be in order.
6. **The Bid -3** shall be opened of those contractors who will be found technical qualified for that item of the **work**. The date of opening Envelope 3 shall be intimated on line after approval of technical bid from the competent authority.
7. Bid document can be downloaded from the website of Chandigarh Administration Chandigarh <https://etenders.chd.nic.in>. However, for general information, guidance and reference, the Bid Document can also be viewed & downloaded on website mentioned above.
8. The Bidders should upload in Electronic Format on the website scanned copies of eligibility documents shall also be uploaded along within the prescribed time limit.
9. The firm should submit a signed and stamped copy of the DNIT and all other documents duly signed and stamped as uploaded while submitting e-bid in the office of CREST, Paryavaran Bhawan, Sec-19, Chandigarh along with the physical submission of EMD after 1700 hrs on 10.08.2022 and by 1200 hrs on 12.08.2022. The Agency has to produce the original documents as and when asked for by Chief Executive Officer, CREST, and Chandigarh. The failure of the Agency to furnish the said original documents will entail summarily rejection of its tender.
10. Meeting for scrutiny of technical bid and eligibility criteria shall be held as mentioned against the works in the office of Chief Executive Officer, CREST, Chandigarh.
11. The acceptance of a tender will rest with the Competent Authority who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all the above conditions, tenders without assigning any reason thereof. All tenders in which the above conditions are not fulfilled will be rejected. The Competent Authority further reserves to himself to right to accept the tender in part i.e. for only quantity and reject it for the rest.

12. **Certificate of financial turnover:** At the time of submission of bid contractor may upload Affidavit/Certificate from CA mentioning Financial Turnover of last (three) years or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids. **There is no need to upload entire voluminous balance sheet.**
13. The Chief Executive Officer, reserves to himself the right of issuing his own material at the rates specified in the Annexure to this notice.
14. Conditional tenders are liable to be rejected.
15. Incomplete tenders shall liable to be rejected.
16. **The contractor shall be required to sign the contract agreement as per prescribed Performa of CREST within 30 days from the date of issuance of work order.** Failure on his part to do so may result in invalidation of the contract and forfeiture of the earnest money/ performance Bank Guarantee/FDR.
17. Contractor submitting applications after the opening of the tenders offering lower rates will be black listed for **minimum two years.**
18. The tenderer withdraws or amends his offer within a period of three months, he is liable to be blacklisted for **minimum two years.**
19. The tendering firm shall satisfy the following eligibility criteria:
 - i) Average financial turnover of the tenderer or its group company/s with same Directors or Parent Company should be at least **Rs. 5.75 Cr.** in last three financial years ending 31.03.2022

The bidder shall also use the turnover of its parent company to fulfill the Financial Eligibility criteria. In-case where the bidding company has used the Financial Eligibility Criteria of its Parent Company then it needs to be ensured that no change in the Controlling Equity of the Bidding Company is done prior to 05 (Five) Years from the date of Commissioning of the sanctioned capacity except with the prior approval of CREST.
 - ii) Experience of having successfully completed similar works during last seven years ending 31.03.2022 should be either of the following.

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

OR

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

OR

One similar completed works costing not less than the amount equal to 80% of the estimated cost.
 - iii) **Similar works means Supply, Installation, Testing & Commissioning of SPV Power Plant OR Installation & Commissioning (I&C) of SPV Power Plant of capacity greater than or equal to 1000kWp in India and the firm should have done the work in his own name.**

- iv) The firm should have service centre in or around Chandigarh within a radius of 50 KM with qualified staff. If not having then the same has to be opened within one month of work order.
- v) The firm should have authorization from the manufacturer of the PCU (Inverter) and SPV Module.
- vi) The SPV modules to be used should be made in India.
- vii) **The bidder must have satisfactory installed & commissioned at least a single Rooftop/Ground mounted/Canal Top/Floating grid connected SPV system of 1000 kWp capacity in India under any Govt. agencies/ State Nodal Agencies/ Govt. Public Sector or the satisfactory installed & commissioned as empanelled party of Govt. agencies/ State Nodal Agencies/ Govt. Public Sector and commissioning certificate being issued by Govt. agencies/ State Nodal Agencies/ Govt. Public Sector or successfully installed & commissioned under private sector in India and commissioning certificate issued by Govt. agencies/ State Nodal Agencies/ Govt. Public Sector and the same should be working satisfactorily. Party will submit this certificate along with tender bid.**
- viii) **The bidder must have supplied and installed min. 1000kVA, 415V/11kV, 50Hz step up transformer along with all protections, switchgears, vacuum circuit breakers, etc.**
- ix) **Manufacturers of Solar Cells or SPV panels with annual plant capacity of 50MWp need not to submit eligibility documents related to clause no. (ii), (iii), (vii) and (viii) mentioned above. But need to submit documents related to Factory Capacity from CA.**

The firm will submit the following documents in respect of above criteria.

- a) The bidder should upload affidavit/ certificate from CA mentioning financial turnover of last three years along with the technical bid. However, complete balance sheet, copy of Audited Financial statement with profit and loss account for the last three years if required may be asked from the contractor after opening of tech bid.
- b) Detail of service centre after sale of service equipment with telephone facility.
- c) Proof of execution of similar nature of work with copy of certificates of satisfactory completion and performance from an authority for whom the work was executed including agreement amount, actual amount, date of start, date of completion **but exempted for firms falling in category as mentioned on clause (ix) above.**
- d) Authorization of the manufacturer of PCUs and SPV Module as per Performa attached.
- e) Documentary proof for SPV modules being manufactured in India.
- h) The firm should also upload an Undertaking on its letterhead that all the terms and conditions of the DNIT are acceptable to the Bidder.
- i) The bidder should submit a notarized affidavit on Indian Non judicial stamp paper of Rs.10/- that the proprietor/firm/ bidder has never been black listed by the organization.

20. The tender shall remain valid for 3 months from the date of opening of the price bid.

21. The tenderer shall quote the rate both in figure as well as in words.

22. Instructions to Bidders regarding e-tendering process:

- a. Tenders without digital signatures will not be accepted in the Electronic Tendering System.

No tender will be accepted in physical form and in case it has been submitted in the physical form it shall be rejected.

- b. Before submission of online Bids, Bidders must ensure that scanned copies of all the necessary documents have been uploaded with the Bid.
 - c. It will be mandatory for all the Bidders to upload all the documents mentioned under 'Tender Detail', template read under '**Cover Details**'.
 - d. The applicants should upload a pdf sheet indicating the description as mentioned under Cover Details and by mentioning 'Not Applicable' in the body of the document as the tender uploading process cannot be completed until and unless all the documents mentioned under the 'Cover Details' have been uploaded.
 - e. Chief Executive Officer, CREST, Chandigarh will not be responsible for any delay in online submission of the Bids due to any reason whatsoever.
 - f. CEO, CREST has full rights to accept or reject any or all the tenders without assigning any reason thereof.
23. For any technical issue related to Electronic Tendering Portal, bidders may contact CREST, 1st Floor, Paryavaran Bhawan, Sector-19, Chandigarh or email at etender@chd.nic.in, Phone No. 0172-2740641.
24. **No additional documents will be accepted after opening of the technical bid on due date. The sole criteria of qualification / disqualification will depend on the documents uploaded by the bidders.**
25. Any material / instrument required to complete/ successful running of the project which is not mentioned in the DNIT will be provided by the party in the quoted rates only.
26. **The bidder should fill the cost break up form placed at Annexure- D and load it along with the financial bid.**
27. It is mandatory to upload scanned copies of all the documents including as stipulated in the bid document. If such document is not uploaded this bid will become invalid and cost of bid document & processing fee shall not be refunded.
28. If the contractor is found ineligible after opening of bids, his bid shall become invalid and cost of bid document shall not be refunded.
29. If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the contractor the bid shall become invalid and cost of bid document shall not be refunded.
30. The work can be increased or decreased in the interest of CREST without assigning any reason thereof.

(Chief Executive Officer)
CREST, Chandigarh

SECTION-C

SPECIAL CONDITIONS

SPECIAL CONDITIONS

- 1** The following instructions must be carefully observed by all the tenderer. Tenders not strictly in accordance with these instructions shall be liable to be rejected.
- i) The rates shall be quoted in figure as well as in words. The amount of each item shall be worked out and the requisite total given.
 - ii) Telegraphic tenders shall not be accepted.
 - iii) The department reserves the right to modify the schedule of requirements, technical particulars and the specifications at any time and to place the order as a whole or in parts, and to reject any or all the tenders without assigning any reasons. The Department will not be responsible for and will not pay for expenses for losses that may be incurred by tenderer in the preparation of the tenders.
 - iv) The successful tenderer shall be called upon to enter in an agreement on prescribed form. The contract would be of the nature of individual work contract and CREST is not bound to issue Form D etc which is not subject to any sales tax or furnishing of Form D.
 - v) The CEO, CREST reserves the right for any omission/correction in the Notice inviting tender.

2 **PRICE**

The price quoted shall be on turnkey basis and should be exclusive of GST on material in respect of this contract. Government/CREST will not entertain any claim whatsoever in respect of the same even if G.O./ state imposes any additional duties etc.

- 3** The tenderer shall acquaint with the work and working conditions at site and locality. No claim shall be entertained on this issue after the offer has been submitted. Once the firm has submitted the bid, it shall be presumed that they have inspected the site and work conditions.

- 4** The unit rate of the equipment and accessories listed in the Cost Break Up form. The tenderer must quote for each item contained in the Annexure-D and upload the same with the financial bid.

5 **Inspection:-**

- (a) The Department/CREST may inspect the Equipments / Materials at the manufacturer's premises before dispatch of the material at its own cost. However, the contractor has to arrange facilities for inspection of equipment/ material including conducting the required tests in the manufacturing units without any extra cost.
- (b) In case of any critical equipment (PCU/Inverter) being manufactured in country other than India then the contractor has to arrange factory test report duly attested on each

page by Manufacturer of the critical component. The PCU/Inverter shall be tested at the time of "Third Party Inspection"(TPI) after commissioning of the Project.

(c) In order to have technical control and quality assurance the "Third Party Inspection"(TPI) shall be done from the outside agency by the department / CREST at its own cost. However, the bidder has to provide all necessary help and support in getting the third party inspection carried out at site after installation and commissioning of the system.

6 No claim on account of fluctuation in prices due to any reason shall be considered.

7 The work shall be completed to the entire satisfaction of the CEO, CREST.

8 The firm has to strictly follow the fair wage clause.

9 COMPLETION PERIOD:-

The time allowed for completion of work of SPV Power Plant shall be 5 months from the written order to commence the work. However the firm will make best efforts for commissioning of project in minimum time period.

10 COMMISSIONING:-

The Canal Top SPV Power Plant will be deemed to be completed after completion of installation work and submission of Bi-directional Meters, CT/PT Units and Package Sub Station for testing. After completion of installation work in all respect a Plant Completion report (PCR) will be signed by the CREST, Third Party Inspection Agency and the bidder. However the Canal Top SPV Power Plant will be considered commissioned after energization of SPV Power Plant by Electricity Department and when each of the sub-system is individually commissioned, tested and after concluding the satisfactory performance of the same.

11 RIGHT TO CHANGE/ISSUE AMENDMENT:

The CREST reserves the right to waive off or to issue any amendments to the terms and provision of the work order/purchase order as the emergency demands.

12 MATERIAL :

The material to be used in the manufacture of the equipment to be supplied against contract shall be of the good quality conforming to BIS/foreign standard and carry certification/making wherever applicable. The firm/agency shall be solely responsible for the procurement of material required for the purpose.

The design shall comply with all statutory requirements, safety codes, regulating bodies, whether or not explicitly specified in this document. Any observations noticed shall immediately be brought to the notice of the department at the time of submission of tender.

The firm must produce the genuity certificates from the original equipment manufacturer for major equipments including gate pass, excise and custom clearance certificates etc.

13 **TEST CERTIFICATES AND INSTRUCTION BOOK**

The manufacturer/agency shall furnish to the CREST the following documents along with the consignment.

Printed Pamphlets/Catalogues: 2 Copies for each item of equipment.

Instruction Book for operation and maintenance of complete system.

Drawing of all the equipments.

Any other relevant information to be incorporated at the time of placing the purchase order 2 copies.

The manufacturer/agency shall furnish the required FTR'S along with consignment of material.

14 **GUARANTEE :**

The SPV module shall be guaranteed life of 25 years and all other equipments shall be guaranteed for a period of 10 years from the date of taking over the installation by the Department against unsatisfactory performance and/or break down due to defective design, workmanship of material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith replaced free of cost to the satisfaction of the Chief Executive Officer. In case it is felt by the department that undue delay is being caused by the firm in doing this, the same will got done by the department at the risk and cost of the firm. The decision of the Chief Executive Officer in this regard shall be final.

15. **EXPECTED ELECTRICAL ENERGY GENERATION:**

The bidder has to submit an undertaking regarding minimum expected electrical energy generation of 1300 kWh per 1kWp system on LT side for first year. The 1% decrease of minimum expected electrical energy generation due to degradation factor of SPV module is allowed from 2nd year onwards. The bidder may indicate the guaranteed electrical energy generation from their system after making proper assessment. Any deficiency in the generated electrical energy output will

be recovered @ Rs. 10 per unit from their bill. The assessment for such deficiencies will be made on yearly basis. Further, if any deficiency in the generated electrical energy output, the bidder has to increase the number of SPV modules so as to reach upto the minimum electrical energy generation.

Grid Down Time: “The Grid Down Time benefit of 0.5kWh/kWp/hour round the year shall be given to the bidder for power outage between 9:00A.M. to 4:00P.M.”

Note:- The Solar Energy generation shall be calculated on the basis of meter reading of Uni-directional Energy Meter installed at (LT side) on A.C Side.

16 PERFORMANCE GURANTEE

The firm shall submit the performance guarantee in the form of an irrevocable bank guarantee bond of any scheduled bank having branch in tricity in the prescribed form given in annexure C OR FDR (Fixed Deposit receipt) for the amount of 3% of Capital Cost of the project (part-A) valid for One Year within 15 days from date of issuance of work order. The performance Bank guarantee / FDR shall be returned after the satisfactory completion of work and submission of new bank guarantee/ FDR (3 % of Capital Cost of the project valid for entire period of operation and maintenance i.e 10 years. The earnest money submitted at the time of bid 1(one) shall be returned after the submission of bank guarantee / FDR of 3% (for 1 year). The earnest money/ Performance Bank Guarantee/ FDR submitted at the time of bid 1(one) shall be forfeited along with blacklisting of firm for minimum **two years if the firm fails to start the work within allotted timeline**. The security deposit shall be debited from the running bills as per payment terms. The performance Bank guarantee/FDR shall be returned after the satisfactory completion of work and submission of new bank guarantee/FDR (3 % of Capital Cost of the project valid up to entire period of operation and maintenance for 10 years) as per payment terms

17 JURISDICTION:

All legal proceedings in connection with this contract shall be subject to the territorial of local civil courts at Chandigarh only.

18 The Administration reserves the right to modify/relax any of the condition while evaluating the Technical Bids. The Chief Executive Officer reserves the right to reject any or all technical bids without assigning any reason under no obligation to inform the manufacturer/agency of the reason of rejection.

19 **INSURANCE :**

Comprehensive insurance cover for men, machinery and all parts shall be arranged by the firm for entire period of contract and O&M. The firm shall make his own arrangement to receive and store the material at site. The settlement of claims with the insurance company, railway authorities etc. for any loss/damage occurring during transit and storage at works site shall entirely be the responsibility of the firm. In case firm fails to provide such an insurance cover, after making any payment against the project the Department would get the material insured at the cost of recoverable from the firm. For details refer page 36-37 of the tender.

20 **PAYMENT TERMS**

The terms of payment shall be as under:-

- i) 60% of the project capital cost i.e. design, manufacture, supply, erection, testing and commissioning cost (Part A) on receipt of material at site in good condition along with relevant documents to the satisfaction of CEO, CREST. The breakup of 60% eligible payment is as following:
- 20% payment of 60% eligible payment will be released after receiving of Module Mounting Structure at site.
 - 50% payment of 60% eligible payment will be released after receiving of SPV Modules at site.
 - 30% payment of 60% eligible payment will be released after receiving of balance of material at site.

Payment equivalent to 5% of project Capital Cost will be withheld from 60% eligible payment (against supply of material) as security deposit.

- ii) 20% of the project capital cost (Part A) shall be made after the installation, testing and commissioning of the Plant. Payment equivalent to 2% of project Capital Cost will be withheld from 20% eligible payment as security deposit.

- iii) 20% of the project capital cost (Part A) alongwith security deposit withheld during running bills shall be made after the final acceptance of the department/CREST and after completion of trial run of at least two months and submission of the bank guarantee of 3% of the capital cost of the project (part-A) OR FDR (Fixed Deposit receipt) from any scheduled bank having branch in tricity valid for entire period of operation and maintenance i.e. 10 years. The Bank Guarantee/FDR submitted at initial stage shall be valid for min. 1 year. The generation of SPV Power Plant during trial run period shall be calculated on PR basis and minimum required PR should not be less than 75%.

The whole GST amount against supply of material on actual as per invoice received against the Project will be released during release of payments against running bills subject to condition that GST must be reflecting on the GST portal

- iv) The minimum cost of Part B i.e. comprehensive O&M cost for 10 years for the solar power plant to be installed is 10% of the capital cost i.e. cost of material, installation and commissioning of the project (part A). **If the bidder quotes O&M charges for 10 years (part B) to be less than 10% of the capital cost (Part A), then the bid is liable to be rejected.**

O&M charges for 10 years (Part B) shall be released in the manner annually @5% of B at the end of 1st year, @5% of B at the end of 2nd year, @8% of B at the end of 3rd year, @8% at the end of 4th year, @10% at the end of 5th year, @10% at the end of 6th year, @12% at the end of 7th year, @12% at the end of 8th year, @15% at the end of 9th year, @15% on the completion of 10th year.

In case the bidder quotes the O&M charges (Part B) to be more than 10% of capital cost (Part A) then also the payment for O&M charges per annum shall be released in proportion as above.

- v) Payment of operation and maintenance (O&M) shall be made on annual basis after the end of each year after satisfactory operation and maintenance of the plant.

- 21** DEVIATION
Deviation if any shall be considered only if pointed out by the firm in the Pre Bid meeting. No deviation will be considered with the bid.
- 22** CANCELLATION
The department reserves the right to cancel the purchase/work order as whole or in part at any time or in the event of default on the part of the tenderer.
- 23** No living accommodation for the staff of manufacturer/ agency shall be provided by the Department.
- 24** Carriage of material to site shall be the responsibility of the firm at their own cost.
- 25** The firm must mention of makes of the material to be installed
- 26** In the event of tenderer offering material/items manufactured by different manufacturers, it shall be his responsibility to fully co-ordinate the activities of each manufacturers in such a way that the complete equipment contracted is supplied in time. No extra charges shall be payable for these services.
- 27** Any accessories/item which may not have been mentioned in the specification/ REQUIREMENT but are required for satisfactory commissioning the work shall be deemed to be included in the contract and shall be provided by the tenderer without extra charges later on.

28 PENALTY/DAMAGES FOR DELAYS

If the firm fails to execute the work within the stipulated time period, the firm shall be liable to pay the penalty as under:

Sr. No	Description of Milestone (Physical)	Time allowed in days (from date of placement of work order)	Penalty in case of non achievement of each milestones
1.	a) Submission of Data sheet/ Drawings/ SLD/BOM and other technical details of module structure etc. b) Getting approval from the department/CREST	15 Days 20 Days	1% of Project Capital Cost will be withheld
2.	a) Inspection call of SPV modules, PCU's/ Inverters, Structure material, PSS and BOS. The inspection call shall be valid only when it is submitted along with signed and stamped Factory Test Report/ I-V Curve, other recognized standard test etc b) Getting Approval from department / CREST	30 Days 40 Days	1% of Project Capital Cost will be withheld
3.	Transportation to the site	70 Days	1% of Project Capital Cost will be withheld

4.	Installation	130 Days	1% of Project Capital Cost will be withheld
5.	Completion of installation work of SPV power plants.	150 Days	1% of Project Capital Cost per two weeks and Max. Up to 10% of value of project capital cost.

The amount of penalty withheld will be returned back if the Project is completed within the stipulated time period. However, successful bidder should make full efforts to get the SPV Power Plant energized, testing & Commissioned within shortest duration from completion of installation work. Followed by which payment against commissioning as per DNIT Payment terms will be released to the successful bidder.

29 Earnest money shall be forfeited in case of withdrawal/modification of an offer within the validity period as required in Notice inviting Tender/Tender, specification after opening of tender.

30 NEGLIGENCE, DEFAULT AND RISK PURCHASE

In case of negligence on the part of manufacturer/agency to execute the order contract with the negligence and to comply with any reasonable orders given in writing by the Purchaser, and on contravention if any provisions of the work order/contract the department may give 07days notice in writing to the manufacturer/agency to make good the failure or negligent or contravention and if the manufacturer/agency fails to comply with the notice within time considered to be reasonable by the purchaser, he will have the right to main risk purchase/work order for full or part of the quantities at the risk and cost of the supplier and or cancel the contract and claim due compensation/damages for the tenderer.

31 FORCE MAJEURE

During the pendency of the contract/purchase order, if the performance in whole/part by either party or any obligation the tenderer is prevented/delayed by cases arising out of any war hostilities commotion acts of the public enemy, sabotage, fire, floods, explosion, epidemic or non-availability of Government controlled raw material under order instructions of Central, Civil Military authorities on any other causes beyond their reasonable control neither of the two parties shall be made liable for loss or damages due to delay or failure to perform the contract, during the currency of Force Majeure conditions provided the happenings is notified in writing with documentary proof.

32 EXTENSION AND COMPLETION PERIOD

Any genuine delay in approval of technical details, drawing samples, issuance of amendments to purchase/work order conducting inspection and approval of inspection Test Report/Test certificates allowing dispatches etc. will Count towards extension of the delivery period by corresponding period other than admissible under force Majeure Conditions, if any, substantiated by the tenderer and duly accepted by the purchaser and CEO, CREST will be having full powers to give extension if deemed fit.

33 VALIDITY

The period validity shall not be less than 90 days from the date of opening of financial bid as specified in the Notice inviting Tenders. If any tenderer withdraws his tender before the said period or makes any modifications in the terms or conditions of tender which are not acceptable to the Department, then the Government shall without prejudice to any other rights or remedies shall forfeit the said amount of earnest money.

34 TRAINING

If required, the successful tenderer shall arrange the training of department's engineer at their work so as to make him familiar with the manufacturing of the assembly process of the equipment covered by this specification. The boarding and loading expenses of the Trainee(s) shall how ever to be borne by the Department.

35 All civil work relating to installation of Solar Power Plant shall be carried out by the tenderers without claiming any extra cost.

36 The firm shall have to employ employee qualified engineer for the supervision of the work at site. The firm must submit the qualification application along with all the information along with relevant documents as per format.

37 The work shall be carried out as per CPWD General Specifications and laid down in the schedule of work.

38 All the electrical works shall confirm to the following:

- Central Electricity Authority (Technical Standards for Connectivity of Distributed Generation Resources) Regulations, 2013
- Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
- Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010
- Any other amendments or revised/new regulations till installation of Canal Top SPV Power Plant.

39 Do's and don'ts for safety shall be on the invertors, AC & DC distributions panels.

40 The firm must fill up the guaranteed Technical parameters / details of SPV modules / Invertors in the Performa attached.

41 In case of any dispute arises that will be in the jurisdiction of Chandigarh and President, Executive Committee, CREST/ Secretary Science & Technology & Renewable Energy shall be the sole arbitrator for that.

42. In case any clause is left that will be as per CPWD manual.

43. **In case any specification is left that will be as per the MNRE (GOI) specification.**

44. **The bidder shall be allowed to use auxiliary power for water and electric connection required during the installation of the plant and Operation and Maintenance for 10 years from the existing source/supply available. The use of water for cleaning of modules shall also be allowed to the bidder without any charges.**

45. Action on failure to commence the work:

If the contractor fails to commence the work within 30 days the earnest money / performance bank guarantee/ FDR will be forfeited by CEO, CREST along with Blacklisting of firm for **minimum two years.**

CLAUSE 3- When Contract can be Determined

Subject to other provisions contained in this clause, the CEO, CREST may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- (i) If the contractor having been given by the CEO, CREST a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.
- (ii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the CEO, CREST (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the CEO, CREST.
- (iii) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the CEO, CREST.
- (iv) If the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 15 days after a notice in writing is given to him in that behalf by the CEO, CREST.
- (v) If the contractor shall offer or give or agree to give to any person in Government service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Government.
- (vi) If the contractor shall enter into a contract with Government in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the CEO, CREST.
- (vii) If the contractor shall obtain a contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering.
- (viii) If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.
- (ix) If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts

with the entire works or any portion thereof without the prior written approval of the CEO, CREST. When the contractor has made himself liable for action under any of the cases aforesaid, the CEO, CREST on behalf of the President of India shall have powers:

- (a) To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the CEO, CREST shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Government.
- (b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the CEO, CREST, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the CEO, CREST has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 4 Time and Extension for Delay:

The time allowed for execution of the Works as specified in the Work Order or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in Work Order or from the date of handing over of the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, CREST shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.

4.1 If the work(s) be delayed by:-

- (i) Force majeure, or
- (ii) Abnormally bad weather, or
- (iii) Serious loss or damage by fire, or
- (iv) Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
- (v) delay on the part of other contractors or tradesmen engaged by CEO, CREST executing work not forming part of the Contract, or Inter Departmental Delay in installation of Bi-directional Meters by Electricity Department. .
- (vi) Non-availability of stores, if it was the responsibility of CREST to supply or
- (vii) Any other cause which, in the absolute discretion of the CEO, CREST is beyond the Contractor's control. then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the CREST but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the CEO, CREST to proceed with the works.

4.2 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing **within fourteen days** of the

happening of the event causing delay on the prescribed form to the authority. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

4.3 In any such case the authority as indicated in DNIT may give a fair and reasonable extension of time and reschedule the mile stones for completion of work. Such extension shall be communicated to the Contractor by the CREST in writing, within 3 months of the date of receipt of such request. **Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the authority as indicated in DNIT and this shall be binding on the contractor.**

CLAUSE 5 Work to be Executed in Accordance with Specifications, Drawings, Orders etc:

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE 6 Foreclosure of Contract due to Abandonment or Reduction in Scope of Work–

If at any time after acceptance of the tender, CREST shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the CEO, CREST shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

CLAUSE 7 Action in case work not done as per Specifications

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the CEO, CREST, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the Department or any organization engaged by the Department for Quality Assurance and of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the CEO, CREST or his authorized subordinates incharge of the work or his subordinate officers or the officers of the organization engaged by the Department for Quality Assurance or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the

execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months of the completion of the work from the CEO, CREST specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the CEO, CREST in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as mentioned in the Clause for Compensation for Delay of the contract (for non-completion of the work in time) for this default.

In such case the CEO, CREST may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the CEO, CREST to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE-8 Action and Compensation Payable in Case of Bad Work

It shall appear to the CEO, CREST or his subordinate in-charge of the work that any work has been executed with unsound, imperfect, unskillful workmanship or with materials of any inferior description or that any articles or materials provided by the contractor for the execution of work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor shall, on demand in writing by the CEO, CREST specifying the work, materials or articles complained of, notwithstanding that the same have been inadvertently passed, certified and paid for, forth and rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost. In the event of his failing to do so, within a period to be specified by the CEO, CREST in his demand aforesaid, the contractor shall be liable to pay compensation at the rate of one percent of the estimated amount for every week not exceeding ten weeks, while his failure to do so shall continue and in the case of such failure, the CEO, CREST may rectify or remove and re-execute the work to remove and replace with others, the materials or articles complained of as the case may be at the risk and expense in all respect of the contractor.

CLAUSE-9 WORK TO BE OPEN TO INSPECTION

All work under in course of execution or executed in pursuance of the contract shall at all times to be open to the inspection and supervision of the CEO, CREST and his senior/subordinates and the contractor shall at all times during the usual working hours and at all other times at which reasonable notice of the intention of the CEO, CREST or his senior/subordinates to visit the works shall have been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent, duly accredited in writing, present for that purpose. Orders given to a contractor's agent shall be considered to have the same forces as if they had been given to contractor himself.

CLAUSE-10 WORK NOT TO BE SUBLET. ACTION IN CASE OF INSOLVENCY

The contract shall not be assigned or sublet without the written approval of CEO, CREST. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the CEO, CREST on behalf of the Chandigarh Administration shall have power to adopt the course specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted, the consequence specified in the said clause 3 shall ensue.

CLAUSE 11 MINIMUM WAGES ACT TO BE COMPLIED WITH

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 12 SETTLEMENTS OF DISPUTES & ARBITRATION

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

(i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the CEO, CREST on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request the Secretary, Science & Technology & Renewable Energy Department/President of Executive Committee, CREST, in writing for written instruction or decision. Thereupon, the Secretary, Science & Technology Department/President of Executive Committee, CREST shall give his written instructions or decision within a period of one & half month from the receipt of the contractor's letter.

If the Secretary, Science & Technology Department/President of Executive Committee, CREST fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instructions or decision of the President, Executive Committee, CREST, the contractor may, within 15 days of the receipt of President, Executive Committee, CREST's decision, appeal to the Chairman, CREST who shall afford an opportunity to the contractor to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Chairman, CREST shall give his decision within 45 days of receipt of contractor's appeal. If the contractor is dissatisfied with this decision, the contractor shall within a period of 45 days from receipt of the decision, give notice to the Chairman CREST, for appointment of arbitrator, failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

(ii) Except where the decision has become final, binding and conclusive in terms of Sub Para (i) above, disputes or difference shall be referred for adjudication through arbitration by a sole arbitrator appointed by the Chairman, CREST. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Chairman, CREST of the appeal.

It is also a term of this contract that no person, other than a person appointed by such Chairman, CREST as aforesaid, should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

It is also a term of this contract that if the contractor does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 120 days of receiving the intimation from the CEO, CREST that the final bill is ready for payment, the claim of the contractor shall be deemed to have been waived and absolutely barred and the CREST shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is also a term of this contract that the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds Rs.1,00,000/-, the arbitrator shall give reasons for the award.

It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid equally by both the parties. It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid or settle the amount of costs to be so paid.

CLAUSE 13 DEDUCTIONS OF AUTHORITY DUES ON ANY ACCOUNT WHATSOEVER TO BE PERMISSIBLE

Any excess payment made to the contractor inadvertently or otherwise under this contract or on any account what-so-ever and any other sum found to be due to the CREST by the Contractor in respect of this contract or any other contract or work-order on any account what-so-ever may be deducted from any sum payable by the CREST to the contractor either in respect of this contract or any work order to contract or on any other account by any other department of the Authority.

CLAUSE 14 ACTION WHERE NO SPECIFICATIONS ARE SPECIFIED

In the case of any class of work for which there is no such specifications, such work shall be carried out in accordance with the Bureau of Indian Standards/MNRE Specifications. In case there are no such specifications in Bureau of Indian Standards/MNRE, the work shall be carried out as per manufacturers' specifications, if not available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the CEO, CREST.

CLAUSE 15 COMPLETION CERTIFIED AND COMPLETION PLANS

Within ten days of the completion of the work, the contractor shall give notice of such completion to the CEO, CREST and within thirty days of the receipt of such notice, the CEO, CREST shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution, thereof, and not until the work shall have been measured by the CEO, CREST. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the CEO, CREST may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE 16 PAYMENT OF FINAL BILL

The final bill shall be submitted by the contractor within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the CEO, CREST whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and payment of final bill as far as possible be made within the period specified here in under, the period being reckoned from the date of receipt of the bill by the CEO, CREST or his authorized Project Director or Project Manager,

- (i) If the Tendered value of work is up to Rs. 15 lac : 3 months
- (ii) If the Tendered value of work exceeds Rs. 15 lac : 6 months

CLAUSE 17 CARRYING OUT PART WORK AT RISK & COST OF CONTRACTOR

If contractor:

- (i) At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the CEO, CREST; or

(ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the CEO; or

(iii) Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the CEO. The CEO, CREST without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to Government, by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to:

(a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

(b) Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The CEO, CREST shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by Government because of action under this clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the CEO, CREST as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by CREST in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by Government as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Government in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the CEO, CREST shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

In the event of above course being adopted by the CEO, CREST the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

CLAUSE 18 INSURANCE:

Comprehensive insurance cover for men, machinery and all parts shall be arranged by the firm for entire period of contract. **The Cover Note of Insurance shall be in the name of "CREST"**

only (Owner of the Project) and in case of any calamity, the claim shall be settled in favour of CREST. The firm shall make his own arrangement to receive and store the material at site. The settlement of claims with the insurance company, railway authorities etc. for any loss/damage occurring during transit and storage at works w\site shall entirely be the responsibility of the firm. In case firm fails to provide such an insurance cover, after making any payment against the project the Department would get the material insured at the cost of recoverable from the firm.

Penalty for non renewal of insurance: The penalty amounting to Rs. 500/- per day will be imposed on the firm in the absence of insurance policies for men, machinery and all parts. In case of any damage / loss / mishappening occurs in the absence of insurance policies than the firm will be responsible for the same.

CLAUSE 19 CLEARANCE OF ELECTRICAL INSTALLATIONS:

All the electrical works shall confirm to the current Indian Electricity Rules and Regulations. To get the electrical clearance from the Electrical Inspector before evacuation is the sole responsibility of the contractor. Expenditure on electrical clearance will be at the part of the contractor. The commissioning of SPV Power Plant will be considered after installation of Bi-directional Meter by Electricity Department.

CLAUSE 20 (a) STATUTORY LEVIES

The rates as offered and accepted in this contract are exclusive of GST and inclusive of statutory levies such as Income Tax, Octroi/Terminal Tax, Sales Tax, Turnover Tax, royalty, contribution under Employee's State-Insurance and local taxes payable under the respective statues (ESI Contribution etc.)

(b) INCOME TAX

Income Tax shall be deducted at source as per provisions of the Income Tax Act and a certificate of such deduction made in each financial year shall be furnished to the contractor by disbursing officer.

(c) SALES AND OTHER TAXES

Sales Tax, Turnover Tax, VAT, Building and other Construction Workers Welfare Cess or any other tax or cess shall also be deducted from the bills of the contractor if so directed by the authorities concerned.

(d) LOCAL LAWS AND LEVIES

The contractor shall comply with the proper bye laws and legal orders of the local body or public authority under the jurisdiction of which the work is executed and pay all fees and charges for which he may be liable. Nothing extra shall be payable on this account.

CLAUSE 21 VARIATIONS IN PRICES

No claim shall be entertained on accounts increase of price and labour and material due to any cause whatsoever.

CLAUSE 22 PERFORMANCE TEST

The contractor shall give a satisfactory performance test of the entire installations as per standard specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for this test.

CLAUSE 23 ACTS OF GOD

No claim whatsoever shall be entertained for any loss or damage caused by rain, floods or any other natural causes or other acts of God.

CLAUSE 24 JURISDICTIONS

The jurisdiction of Civil Courts for matters under dispute shall be on the basis of the location of the office of CEO, CREST.

In case any clause is left in the contract that will be as per the General Conditions of Contract for Central P.W.D Works

CLAUSE 25

If the adequate space is not available for installation of SPV Power Plant at the mentioned site for any reason, the value of the Work Order will be reduced on proportionate rate (per watt basis) and the revised Work Order will be issued to the party accordingly.

CLAUSE 26

The bidder is liable to be Blacklisted for period of minimum two years if found at fault at any of the following situations:

1. Failure to commence the work within 30 days from the date of issuance of work order.
2. If any document such as work experience, Turnover, etc. found false/forged during Technical Evaluation.
3. Failure in doing the Operation & Maintenance for 10 years as per terms & conditions of the DNIT.
4. For Subletting without prior approval from CEO, CREST, complete details is given at clause no. 10, Page no. 33.

CLAUSE 27

The terms and conditions of the agreement have been explained to me/us and I/we certify that I/we clearly understand.

CLAUSE 28

During rainy season or in any case if the sand/pitching is eroded around the foundation of Columns, the same shall be re-filled/repared by the bidder immediately for safety of the foundation/structure.

CLAUSE 29**Cartel Formation/ Pool Rates**

If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, the EMD/BG submitted by the defaulting bidder will be forfeited and the bidder will be debarred from all future tenders of CREST.

**Chief Executive Officer,
CREST, Chandigarh**

SECTION-D

TECHNICAL SPECIFICATIONS

Technical bid

Due On:- 12.08.2022

Approx. Amt: - Rs. 11.5 Cr (GST extra)

Earnest Money:- Rs. 23 Lac

Time Limit: - 5 months for Part-A
10 years for Part-B

Name of the Work:

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant with High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.

1.	Location / Site Details for the SPV Power Project:-	
i)	Address of Site	N-Choe near Garden of Conifers, Sector-52, Chandigarh
ii)	Roof Top	As per site available
iii)	Ambient Temp	45° c (Max) 4°C (Min)
iv)	Latitude	30.712262
v)	Longitude	76.737675
vi)	Elevation	238 Mtr. Above mean sea level
vii)	Tilt Angle	As per space available
viii)	Feeding point	HT side
<u>NOTE:-Sr. no. ii above, BIDDER MUST VISIT THE SITE BEFORE QUOTING THE RATES , OTHERWISE IT WILL BE ASSUMED THAT THE PARTY HAS ALREADY VISITED THE SITE BEFORE QUOTING THE TENDER, AN UNDERTAKING TO BE FURNISHED ACCORDINGLY</u>		

1. Solar Photovoltaic Modules

Solar PV plant array capacity should not be less than the capacity of the SPV Plant capacity and total aggregate SPV array capacity should not be less than 2000kWp on max. radiation day and should comprise of MONO PERC modules of minimum 350 watts. **The Solar Photovoltaic modules must be domestic manufactured as per ALMM list of MNRE GOI** updated from time to time and must be tested & approved by one of the IEC authorized test centers , **Test Certificates can be from any of the NABL / BIS accredited testing / calibration laborites** the module type must be qualified as per IEC 61215(Second Edition). In addition PV modules must qualify to IEC 61730 Part I to II for safety qualification testing. SPV module conversion efficiency should not be less than 18.0% under STC as per MNRE latest guidelines and specification.

The module shall have warranty of 25years with degradation of power generated not exceeding 20% of the minimum rated power over the 25 years period and not more than 10% after 10 years period. The Bidder will have to furnish a CORPORATE GURANTEE on a required stamp paper for the same.

a) **IDENTIFICATION AND TRACEABILITY**

Each PV module used in any solar power project 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 manufacturer (separately for solar cells and modules.
- iv. Country of Origin (separately for solar cells and modules
- 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.
- ix. Name of the test lab issuing IEC certificate

2. SPV PANEL ARRAY STRUCTURES ALONGWITH CIVIL WORK:

This section of Technical Specifications describes detailed technical and functional requirements of all civil and structural works included in the scope.

2.1 Standards & Codes

- 2.1.1 All design and construction of civil works shall conform to relevant Indian standards such as BIS, IRC, MORTH, NBC etc.
- 2.1.2 Design of steel structures shall conform to IS: 800, 801 or 802 as applicable. Design of concrete structures shall conform to IS: 456. For design of liquid retaining structure IS:3370 shall be followed.
- 2.1.3 The design calculations for MMS, RCC structure, Steel structure, Foundation system(including piling), Road work, Drainage work, etc. shall be submitted for prior approval of CREST before commencement of construction.
- 2.1.4 As per project requirements, the CREST may ask for approval of all civil designs and drawings by a Chartered Civil/ Structural Engineer.
- 2.1.5 The design calculations shall be supplemented with a neat sketch showing the structure geometry, node and member nos., lengths of various typical members, support points and type of supports, types of materials & type of sections with properties considered in analysis& design. The report shall also include back-up calculations for various loads adopted in design, brief write-up on primary load cases and design load combinations considered and conclusions on design results (with supporting sketches) for easy reference and clarity. Where a computer program (other than STAAD) is used for analysis and design, the contractor shall include a write-up on the computer program used along with examples for validation check. Design Input (format suitable to the programme used and also in STAAD format) and output file shall also be given in the design report and in soft copy to facilitate its review and approval by the CREST.
- 2.1.6 The methodology for construction of MMS and its foundations, Road & drainage works and other work shall also be submitted for prior approval of CREST before start of these works.
- 2.1.7 The contractor shall be responsible for detailed Topographical Survey of the proposed canal length. The work shall be carried out through an agency with relevant experience and qualified survey team.

2.2 Module Mounting Structure (MMS)

- 2.2.1 The ground mounting structure design shall generally follow the existing land profile. The top of the table shall be in one plane.
- 2.2.2 In MMS analysis the column support shall be assumed at EGL/NGL.
- 2.2.3 The structure shall be designed to allow easy replacement of any module and shall be in line with site requirements.
- 2.2.4 The MMS stub/ column, rafter, purlin, ties and bracing members shall conform to following Indian standards
- IS: 2062 – Hot rolled Medium and High tensile structural steel
 - IS: 811 – Cold formed light gauge structural steel sections
 - IS: 1161 – Steel tubes for structural purposes
 - IS: 4923 – Hollow steel sections for structural use
 - Minimum grade of steel for sections conforming to IS: 811 & IS: 4923 shall be E350
 - conforming to IS: 2062 and YSt 310 conforming to IS: 1608 respectively.
- 2.2.5 The contractor can also propose new light gauge structural steel or structural aluminum sections other than specified in IS: 811 for the purlins subjects to approval of the CREST. In this case the contractor shall submit his proposal stating the technical advantages of the proposed sections for CREST's review along with supporting literature and sample design calculations conforming to present specifications at the time of approval of structure.
- 2.2.6 The primary loads and load combinations for design of MMS structure shall be as specified in design of Structure. The design shall be done by Working stress method and no increase in allowable stress shall be permitted.
- 2.2.7 The maximum permissible deflection/ side sway limits for various elements of MMS under serviceability conditions shall be as following:
- Lateral deflection/ side sway for Column – Span/ 240
 - Vertical deflection for Rafter and Purlin + overhang – Span/ 180
- 2.2.8 For fundamental time period $T_0 > 1.0$ Sec, the design of the MMS structure shall be checked against dynamic effects of wind as per provisions of IS – 875 (Part-3) using gust factor method.
- 2.2.9 The purlins shall be provided with min. following tie/sag rods or angles or channels:
- 1 no., in the mid of each span and shall connect all the purlin members
 - 1 no., diagonal, at each corner in end spans
- 2.2.10 The vertical diagonal bracing shall be provided in end spans and every alternate span of each unit (table) of MMS.
- 2.2.11 MMS shall support SPV modules at a given orientation & tilt and shall absorb and transfer the mechanical loads to the ground properly.
- 2.2.12 All the fabricated structure shall be painted with corrosion resistance paint.

- 2.2.13 It is to ensure that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or any foreign material likely to interfere with the coating process.
- 2.2.14 The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- 2.2.15 Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. All fasteners and washers (2 round + 1 spring) for MMS connections and fixing of PV Module shall be adequately protected from atmosphere and weather prevailing in the area.
- 2.2.16 Fasteners and washers to be used for fixing Module over MMS shall be of stainless steel grade SS 304 & SS 316 with property class A2-50 and A2-70 respectively conforming to relevant ISO standard and must sustain the adverse climatic conditions to ensure the life of the structure for 25 years.
- 2.2.17 Modules shall be clamped or bolted with the structure properly. The material of clamps shall be Al / SS having weather resistant properties. Clamp/bolt shall have EPDM rubber washer and shall be designed in such a way so as not to cast any shadow on the active part of a module.
- 2.2.18 Column post shall generally be supported with base plate secured to foundation using anchor bolts for easy maintenance/ repair/ replacement during operation stage. The anchor bolts shall be galvanized high strength "J" bolts conforming to specifications of IS: 4000/ IS:1367 and relevant IS code Installation of foundation bolts and embedment of column leg in foundation concrete shall be done by using template to ensure proper alignment. The underside of base plate shall be provided with anti- shrink grout.
- 2.2.19 The array structure shall be grounded properly using maintenance free earthing kit.
- 2.2.20 The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.
- 2.2.21 The Bidder should design the structure height min 4 m from the front side. The bidder shall study the complete flow diagram of the canal and based on that the height of pedestal shall be decided.
- 2.2.22 The successful bidder shall submit the foundation and structural design basis for MMS along with the list of reference standards duly certified by a Chartered Engineer having adequate successful experience in similar works which shall be finalized after approval of CEO, CREST
- 2.2.23 The contractor shall submit the detailed design calculations and drawings for MMS structure, bill of materials and their specifications/ standards to the CREST for approval before start of fabrication work as per the engineering work program.
- 2.2.24 The purlin splice shall comprise of flange and web splice plates and splice design shall conform to Annexure-F of BIS:800. For simplicity in fabrication, the splice member may be of CFS channel section without lips (CU). There shall be min. four number of bolts on

either sides of joints in web zones and one number of bolt on either side of joint in flange zones.

2.2.25 For same member type, same section shall be used.

2.3 The following terms & conditions of CREST for the Solar Power Developer and are required to take note of the same before quoting their bids:

2.3.1 There will be no obstruction in the flow of water in the canal and designed FSL will not be disturbed.

2.3.1.1 Due to setting up of solar system, there should be no obstruction to the maintenance/ strengthening work of canal banks.

2.3.2 The maintenance works of solar system to be executed time to time will not be dependent on the canal closure.

2.3.3 The site where solar system is proposed to be set up, there should be no obstruction to the maintenance works and public utilization for traffic on the banks and roads along the canal.

2.3.4 The proposed solar system will be installed at a minimum distance from the permanent structures as specified by CREST for maintenance and safety of these structures. The minimum distance will be fixed depending upon different structures like head works, cross drainage works and bridge etc.

2.3.5 The detailed layout plan and other drawings of these solar systems will be got vetted & approved by the CREST.

2.3.6 While installing the solar system, the height of solar panels and allied structures should be kept sufficient so that no obstruction is faced during cleaning & maintenance of the canal. And successful bidder will maintain a minimum height of 6.5 Mtrs. from bottom of Choe/Canal for maintenance of the Choe/Canal.

2.3.7 The Developer will be fully responsible for any mishap due to this project during the construction and afterwards.

2.3.8 For safety from floating objects, trash etc. in the canal, the bottom of the solar panels/its allied structure at the project site, where solar power project is to be implemented, should be at sufficient height from the FSL.

2.4 Concrete Works

2.4.1 All RCC works shall be using approved design mix as per IS 456 and the materials used Cement, coarse & fine aggregate, Reinforcement steel etc. shall conform to relevant BIS standards.

2.4.2 The min grade of concrete for structural work shall be of M25. For the PCC, it should be of min. grade M15.

2.4.3 Reinforcement steel shall be of high strength TMT bars of grade Fe500 D conforming to IS: Ductile detailing in accordance with IS: 13920 shall be adopted for super structure and sub-structure of all RCC buildings and structures.

2.4.4 Unless specified otherwise for grouting works anti shrink ready mix grout of approved make or cement mortar (CM) grout with non-shrink compound shall be used.

3. POWER CONDITIONING UNIT (STRING INVERTERS):

The power conditioning unit totaling should not be less than 2000kVA should be provided to convert DC power produced by SPV modules, in to AC power. The Individual Inverter should not be less than 100kVA. A multi function power conditioning system combining the functionality of a grid interactive solar inverter with a highly efficient conversion unit having following **Technical Specification:**

Type	: Self commuted, current regulated, high frequency IGBT based with Trench Gate Structure.
Output voltage	: 3 phase, 400V AC (+12.5 %, - 20 % V AC)
Frequency	: 50 Hz \pm 1 Hz
Continuous rating	: Not less than system capacity individually
DC input Operating range	: 200 V to 1000V nominal
Total Harmonic Distortion	: less than 3 %
Operating temperature Range	: 0 to 55 deg C
Housing cabinet	: PCU to be housed in suitable cabinet with minimum IP65 standard
Inverter efficiency	: >95 % at full load.
Power Control	: MPPT

The bidder shall use the original parts in case of any fault in the PCU/Inverter during the O&M period of 10 years. In case the original part/parts are not available with the manufacturer of the PCU/Inverter (Based on certificate from the manufacturer), the bidder shall use the new parts of other standard brands available in the market or will use the repaired parts but only with the prior permission of Chief Executive Officer, CREST.

Other important Features/Protections required in the PCU

- Authentic tracking of the solar arrays maximum power operation voltage (MPPT).
- Array ground fault detection.
- LCD and piezoelectric keypad operator interface Menu driven. In case LCD screen/display is not available then Bluetooth connectivity or other connectivity is mandatory for monitoring through mobile phones in addition to the Data Logger.
- Automatic fault conditions reset for all parameters like voltage, frequency and/or black out.
- MOV type surge arresters on AC and DC terminals for over voltage surge protection from any source.
- PCU should be rated to operate at 0 to 55 deg. Centigrade above ambient temp
- All parameters should be accessible through an industry standard communication link.
- The PCU should go in sleep mode when there is no grid supply.

- 3.1 Since the PCU is to be used in solar photo voltaic energy system, it should have high operational efficiency. The idling current at no load must not exceed 2 percent of the full-load current.
- 3.2 A suitable Surge Protection Device separately at output (A.C. side) shall be provided for the SPV Power Plant.
- 3.3 The PCU output shall be 400V, AC, 50 Hz 3 phase.
- 3.4 The PCU shall include appropriate self protective and self diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.
The PCU shall go to shut down/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay; in sufficient solar power output etc.

a) Insufficient Solar Power Input.

When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to a standby/shutdown mode. The PCU control shall prevent excessive cycling during rightly shut down or extended periods of insufficient solar radiation.

The power conditioning units / inverters should be applicable IEC/ equivalent BIS standard for efficiency measurement and environmental testing as per standard code IEC 61683 and IEC 60068 2(6,21,27,30,75,78). The charge controller/ MPPT units should qualify IEC 62093 and IEC 60068 2 (6,21,27,30,75,78). The junction boxes/ enclosures should be minimum IP 65.

The PCU's should be tested from the MNRE approved test centers' / NABL /BIS accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses. Party must supply and upload the test report of PCU /inverter along with the tender document.

b) Utility-Grid Over or Under Frequency

- 3.5 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.
- 3.6 The PCU generated harmonics measures at the point of connection to the utility services when operating at the rated power shall not exceed a total harmonic current distortion of 3 percent, a single frequency current distortion of 3 percent and single frequency voltage distortion of 1 percent, when the first through the fiftieth integer harmonics of 50 Hz are considered.
- 3.7 The PCU Power factor at the point of utility service connection shall be 0.95 lagging or leading when operating at above 25 percent of the rated output, but may be less than 0.95 lagging below 25 percent of the rated output.
- 3.8 The high voltage and power circuits of the PCU shall be separated from the low-voltage and control circuits. All conductors shall be made of standard copper.
- 3.9 The PCU shall withstand a high voltage test of 2000 V rms, between either the input or the output terminals and the cabinet (chassis).
- 3.10 Full protection against accidental open circuit and reverse polarity at the input shall be provided.
- 3.11 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.

3.12 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 the dc disconnect switch positions shall also be communicated by appropriate messages or indicator lights on the front cover of the PCU enclosure, in case LCD screen/display is not available then Bluetooth connectivity is mandatory for monitoring through mobile phones in addition to the Data Logger.

3.13 Electrical safety, earthing and protection:

- A) Internal Faults: In built protection for internal faults including excess temperature, commutation failure, 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.
 - 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.
- 3.14 The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.
- 3.15 The PCU shall include ground lugs for equipment and PV array grounding. The DC circuit ground shall be a solid single point ground connection in accordance with WEC 69042.
- 3.16 All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years design life of the unit.
- 3.17 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 PCU located indoor should be floor mounted.* In case of String Invertors, it will be installed as per the manufacturer design for which prior approval will be taken from the CREST. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.
- 3.18 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.
- 3.19 All doors, covers, panels and cable exists shall be gasketed or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings no larger than 0.95 cm.
- 3.20 The design and fabrication of the PCU the site temperature, 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.

3.21 Factory Testing:

- A) Preparation 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.

- B) Operation of start up, disconnect and shutdown controls shall also be tested and demonstrated. Stable operation of the PCU and response to control signals shall also be tested and demonstrated.
- C) Factory testing shall include measurement of phase currents, efficiencies, harmonic content and power factor.
- D) A factory Test Report (FTR) shall be supplied along with the unit. The FTR shall include detailed description of all parameters tested qualified and warranted.

3.22 Operating Modes:

The following operating modes are to be made available:

Night or Sleep mode: Where the inverter is almost completely turned off, with just the timer and control system still in operation, losses should not exceed 2 watts per 5 kilowatt.

In case of Grid Failure, the PCU should go in sleep mode/ turned off immediately.

Standby mode: Where the control system continuously monitors the output of the solar generator until pre-set value is exceeded (typically 20 watts)

Operational or MPP tracking mode: The control system continuously adjust the voltage of the generator to optimize the power available. The power conditioner must automatically re-enter stand-by mode when input power reduces below the standby mode threshold. Front Panel display should provide the status of the PCU, including AC Voltage, Current, Power output & DC Current, Voltage and Power input, pf and fault Indication (if any)

3.23. METERING

1. Solar Irradiance: An integrating Pyranometer (Class II or better) should be provided, with the sensor mounted in the plane of the array. Readout should be integrated with data logging system for SPV Power Plant.
2. Temperature: Temperature probes for recording the Solar panel temperature and ambient temperature of the SPV Power Plant.
3. Wind Sensor: To check the wind speed and Readout should be integrated with data logging system for SPV Power Plant.
4. A data logging system for plant control and monitoring shall be provided for the SPV Power Plant with the following features:

Laptop (HP/Dell) 1 No.: Intel i7 processor with 1TB SSD, 16GB RAM, min. 15" Full HD LED Screen along with a LaserJet printer.

Also, the Laptop shall be provided with complete functional software and remote linkage access through service provider for call / email / data transfer / IP linkage for plant operations monitoring throughout the 10 years operation & maintenance period shall be provided.

An independent internet connection for remote monitoring will be at the part of the bidder for entire period of contract / O&M of 10 years either by Sim (GPRS/ Broadband, etc.), any documentation / permission if required for service provider will be arranged by CREST but all the expenditure will be made by the bidder.

The data logging system should be able to display the total cumulative generation data of 2000kWp SPV Project and also to display SPV Power Plants generation data in a single window/link and the inverters used should be having minimum three month data storage memory.

Only Armored LAN cable will be used.

1 Nos. Class (0.5s), 3 phase, 4 wire, Uni-directional Energy Meter along with necessary CTs to be provided to measure the Energy produced by **SPV Power Plants on LT side** which will be installed in the ACDPB or in the LT side of PSS and 2 nos. HT, TPT Meter DLMS Compliant and AMI/AMR compatible class (0.5s) or better 3 phase 4wire, HT (11kV) Bi-directional Energy Meter alongwith necessary CTs & PTs approved by UT Electricity Department will be provided to measure the Energy Exported by the SPV Power Plant and check meter for the Plant. The expenditure on testing and calibrating of Energy Meter shall be borne by the bidder. **Separate indoor type 11KV CT/PT unit is required for each Bi-directional meter.**

All major parameters should be available on the digital bus and logging facility for energy auditing through the internal microprocessor and can be read on the digital front panel at any time the current values, previous values for up to a month and the average values. The parameters should be accessible via the operating interface display.

Protective function limits (Viz-AC Over voltage, AC Under voltage, over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage, Over voltage delay, Under voltage delay over frequency, Ground fault delay, PV starting delay, PV stopping delay).

- **The Meter should have feature to record energy for data storage for injection into the grid through Solar Energy meter.**

Note:

If required, any protection device/ adapter panel/breaker/switchgear/ RMU panel be provided to terminate the SPV Power Plant output on HT side by the party at its own cost.

The termination point of SPV Power Plants under Gross Metering Arrangement/ Virtual net metering Arrangement is nearby 11 KV HT line.

Proper Shed/Room shall be made to install CT/PT Units.

4. Array Junction Box with Surge Protection Device (SPD) & Fuses:

There should be a separate Array Junction Box with Metal Oxide Varistors (MOV) type Surge Protection Device with fuses to be provided for each string inverter on D.C. Side.(IEC61643-1:International Standards for low voltage).

Further, on A.C. Side, the Surge Protection Device should be provided in ACDB, besides the existing SPD device in PCU.

In case, the inverter has provision of inbuilt array junction box, then the separate array junction box is not required.

5. COMMON AC DISTRIBUTION PANEL BOARD (ACDPB)

- 5.1. Common AC Distribution Panel Board (DPB) shall control the AC power from inverter. AC Distribution panel (ACDP) should consist of appropriate size of MCCB/MCB with appropriate breaking capacity as incomer and suitable numbers of MCCB with appropriate size breaking capacity out going switches. **The panel should be provided 3 Phase copper bus bar of suitable capacity.**

- 5.2 Common ACDPB shall have the arrangement for measuring all electrical quantities such as Voltage, Current, Frequency, of different feeder line & energy supplied to the main or different feeder. Common ACDPB shall have sheet iron enclosure of dust & vermin proof & shall have adequate cooling arrangement. **The bus-bars are to be made of copper of desired size.**
- 5.3 The bidder is free to provide the Common AC Distribution Panel Board (DPB) in PSS.

6. CABLES:-

- a) ISI marked **as per given brands** PVC insulated Copper Cond. Cable of various sizes as per load requirement for connecting all the modules / arrays to Jn. Boxes and from Jn. Boxes to inverter and inverter to ACDB.
- b) Cabling in the yard and control room: Cabling in the yard shall be carried out as per IE Rules. Cabling inside control room and array area should be in cable pipes with proper water/moisture protection sealing. All other cabling above ground should be suitably mounted on cable trays with proper covers.
- c) Wires: Only solar copper wires of appropriate size **based on load requirements** of reputed make as specified in DNIT shall have to be used on the DC side. However on A.C side of after ACDB, aluminum cables of appropriate size can be used.

PVC/XLPE insulated armoured sheathed cables required for the plant will be provided by the manufacturer. All cable schedules/ layout drawings have to be got approved from the purchaser prior to installation)

- d) Cables Ends: All connections are to be made through suitable cable/lug/terminals; crimped properly & with use of Cable Glands.
- e) Cable Marking: All cable/wires are to be marked with proper manner by good quality ferule or by other means so that the cable can be easily identified.

Cu/Al. PVC insulated armoured sheathed cables required for the plant will be provided by the manufacturer. However Cables for both D.C/A.C as per brands and specifications mentioned can be used. All cable schedules/ layout drawings have to be got approved from the purchaser prior to installation.

All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, water, humidity, dirt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards.

Cable to be routed in standard manner through cable trays & cable marker to be placed for future identification

The make of cables will be accepted only as specified in the DNIT. If there is any deviation required that may be brought to the notice during the pre-bid meeting after which no query would be entertained.

7. LIGHTNING PROTECTION

There shall be the required number of suitable lightning arrestors installed in the array area. Lightning protection shall be provided by the use of metal oxide arrestors and suitable earthing such that induced transients find an alternate route to earth. Protection shall meet the safety rules as per Indian Electricity Act. **Required no. of ESE type**

Lightning Arrestors will be installed for complete coverage of the whole 2000kWp SPV Power Plant.

8. EARTHING PROTECTION

Each array structure of the PV yard should be grounded/ Earthing properly as per IS:3043-1987. In addition the lightning arrester/masts should also 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./IE Rules. Earth Resistance should be tested in presence of the representative of Department after earthing by calibrated earth tester. PCU, ACDB and Module Structure should also be earthed properly.

9. 2 NOS. PACKAGE SUBSTATION:

2 Nos. Dry type 1000kVA, 415V/11kV, 50Hz step up transformer alongwith all protections, switchgears, required vacuum circuit breakers (630 Amps), RMU panel, Metering panel and cables etc alongwith required civil work as per requirement be provided. Proper foundations and Fencing with Gravels should be made for Package Sub Station.

(The system should be as per latest specifications of U.T., Chandigarh Electricity Department. Design & drawing alongwith specifications of Package Substation shall have to be got approved from CEO, CREST before installation.)

In case of any major fault, the successful bidder will repair/replace the same at no extra cost to CREST and transportation charges for the same will also be borne by the successful bidder.

NOTE: Proper Foundations and barricading of min. 6 ft. height is required around the Package Sub Stations.

10. COMPREHENSIVE MAINTENANCE

All the equipments (but in case of SPV Modules the guarantee period is 25years) shall be provided with comprehensive Maintenance for 10 years against unsatisfactory performance and/or break down due to defective design, workmanship of material. The equipments or components, or any part thereof, so found defective during Comprehensive Maintenance period shall be repaired or replaced free of cost to the satisfaction of the Engineer-in-charge.

11. MODULE CLEANING SYSTEM:

Robotic Dry Cleaning as per site requirement. However, the wet cleaning is also required that shall also be in the scope of the bidder.

12. CCTV Cameras:

Min. 12 nos of Outdoor bullet CCTV Full HD Cameras (1080p) with infrared LEDs alongwith suitable DVR are required to be installed at SPV Power Plant to be provided at location decided by CREST. The required no. of Poles (if required) are also to be installed for installation of CCTV cameras. The online access of Cameras will also provided by the bidder. The bidder is also free to install better cameras with proper monitoring of the site. Cloud storage of Min. 30 days is also in the scope of bidder.

13. FIRE EXTINGUISHER

As per requirement, Fire Extinguishers shall be provided in Control Room and other fire prevents materials like sand basket at the PV array field for the SPV Power Plant **and needs to be re-filled every year.**

14. OPERATOR ROOM:

Portable PUF Cabin shall be provided along with proper foundations as Operators room to be provided. Design and location will be finalized by CREST after consultation with CREST.

15. WALKWAY

Walkway to be provided as per Drawing (Annexure-G) to get access of the SPV Power Plant module for day to day maintenance work

16. Paving and Fencing

Waste Plastic paving tiles (for covering area of min. 2 mtrs wide on both sides) to be used alongwith fencing (GI/MS painted) for the entire Plant upto the satisfaction of CEO, CREST for proper security of Plant.

THE MAKES OF VARIOUS ITEMS SHALL BE AS UNDER:-

Sr no	Description	Make
1.	SPV Modules	To be quoted by the firm. Option of minimum three brands to be quoted by bidder (CREST shall be free to choose any one out of quoted brands) . The Solar Photovoltaic modules must be domestic manufactured as per ALMM list of MNRE GOI updated from time to time and must be tested & approved by one of the IEC authorized test centers , Test Certificates can be from any of the NABL / BIS accredited testing / calibration laborites. The module type must be qualified as per IEC 61215(Second Edition). In addition PV modules must qualify to IEC 61730 Part I to II for safety qualification testing. The Photovoltaic modules must be made in India and tested & approved by one of the IEC authorized test centers, Test Certificates can be from any of the NABL / BIS accredited testing /calibration lab
2.	Power Controlling Unit (Invertors)	SMA/DELTA/ABB/Schneider Electric/ SunGrow/ Havells or approved by MNRE (GOI) Minimum IP 65 standard for outdoor applications. Option of minimum three brands to be quoted by bidder.
3.	Switchgear for AC Distribution Panel	ABB/ SIEMENS / Schneider Electric/ L&T/C&S/ HENSEL as per ISI /International standards
4.	Cables	KEI/ Finolex / Havells / CCI/ Polycab/ Siechem/ Trisolar/ Bizlink/ Tyco/ Banshali and should be ISI/TUV Approved.
5.	Housing cabinets	The field array junction boxes will comply with IP65 standard. The electronics including inverters, CPU, charge controllers, MPPTs, AC & DC distribution boxes should comply IP21 for indoor and IP 65 for outdoor applications.
6.	Surge Protection Devices(Fuses,MOVs)	CITEL/ PHOENIX/ DEHN/ OBO/ SCHNEIDER ELECTRIC/ ABB/ HAGER
7.	Energy Meters	L&T/ Secure/Genus/Avon
8.	Package Substation	ABB / GE / CROMPTON GREAVES / SCHNEIDER ELECTRIC / SIEMENS/ C&S/ JAKSON / VOLTAMP/HARTEK/KIRLOSKAR/PVJ Power
9.	Transformer	ABB / VOLTAMP / GE / CROMPTON GREAVES / KIRLOSKAR / SCHNEIDER ELECTRIC / SIEMENS/ C&S/PVJ Power
10	VCB	ABB / L&T / GE / SIEMENS / C&S / CROMPTON GREAVES / SCHNEIDER ELECTRIC / VOLTAMP/HARTEK/KIRLOSKAR
11	Data Logger	Delremo/ WebDyn/ Trackso/ Logics PowerAMR/ Trinity Touch/ Intello

SECTION -E

OPERATION & MAINTENANCE

1. SCOPE OF OPERATION & MAINTENANCE OF SPV POWER PLANTS FOR A PERIOD OF 10 YEAR FROM DATE OF COMMISSIONING.

- a) Regular operation & maintenance of the SPV Power Plant for a period of ten years after commissioning along with supply of consumable items as and when necessary, under the operation & maintenance contract.

The break down maintenance of the entire system including supply of necessary spare parts, if any, are already under the coverage of warranty clause of the specific condition for a period of 120 months from date of commissioning of power plant. The operation and maintenance schedule of the Canal Top SPV Power Plant during the 10 years contract period shall be as detailed below :

- a) **10 years operation and maintenance period shall begin on the date actual commissioning for the power plant. The requisite number of qualified and trained persons are required to be deputed from 8 A.M. to 6 P.M. daily to take care of all the systems. If person found absent from duty the recovery shall be made @ 500/- per day. CREST have also right to ask the Operation and maintenance Engineer to mark the attendance in CREST office as and when required.**
- b) **The security of the power plant will rest with the tenderer till such time operation and maintenance of the power plant is not handed over to the purchaser/department. The bidders have to appoint the required nos. of Security Guards for security of Canal top SPV Power Plant.**
- c) The deputed persons shall be qualified having Diploma or B.Tech and well trained so that they can handle any type of operation hazard quickly and timely.
- d) The deputed personnel shall be in a position to check and test all the equipment regularly, so that, preventive actions, if any, could be taken well in advance to save any equipment from damage. Any abnormal behavior of any equipment shall be brought to the notice of Engineer-in-Charge immediately for appropriate action.
- e) The deputed personnel shall keep clean the power plant at all the time to achieve the generation required.
- f) Normal and preventive maintenance of the SPV power plant such as cleaning of module surface, tightening of all electrical connections etc.
- g) During operation & maintenance period of ten years of the power plant, if there is any loss or damage of any component of the power plant due to miss management/miss handling or due to any other reasons, what-so-ever, the supplier/firm shall be responsible for immediate replacement/rectification. The damaged component may be repaired, if it is understood after examination that after repairing performance of the component shall not be degraded, otherwise the defective component shall have to be replaced by new one without any extra cost.

2. Operation & Maintenance Instructions:

2.1 The successful bidder shall furnish prior to completion of the works, 2 copies of operation and maintenance instructions in English for approval and supply 2 sets of the approved manuals of instructions at the time of final inspection. These manuals shall properly bound in book form and contain all information, description of equipment,

diagram etc., necessary to enable the customer to operate and maintain the SPV Power Plant.

2.2 Proper Operation & maintenance of the plant shall be carried out by the contractor during O&M period of 10 years with 6 monthly review checkups of plant and equipment.

2.3 Properly qualified and trained personnel well versed in O&M of Canal Top SPV plant and knowledge of computers with approval from purchaser shall be deployed for operation & maintenance who will also be responsible for round the clock maintenance (routine, preventive, breakdown and capital maintenance) of complete plant and equipment in emergency in odd hours.

2.4 Proper repainting, re- coating of exposed surfaces of Module Mounting Structure to prevent rusting & replacement of worn out parts shall be carried out along with the maintenance of the PCU.

- Supplier shall depute on engineer of their company minimum Diploma in Engineering for the operation and maintenance of the plant who shall be fully responsible for the complete O&M and optimum operation of the plant. The name and contact nos. of this engineer shall be notified to the purchaser, for the purpose of contact, responsibility and correspondence with regard to all trouble shooting.
- Plant operation reports in a format prescribed by the purchaser shall be furnished by the supplier on monthly basis.
- Plant shall be operated as per the standard IER practices to ensure proper safety measures.
- The supplier shall ensure replacement of worn out parts and components during the operation & maintenance period for which purpose the supplier shall carry and maintain minimum inventory levels of spares at the plant and at its works.
- In case of delay in repair & maintenance and non observance of purchasers O&M schedules, the purchaser shall have the right to impose any penalties including forfeiture of performance security.
- In case of any fault, the fault must be removed within 24 hours failing which a penalty of Rs. 1,000/- per day shall be charged. However, under Force Majeure circumstances penalty can be waived off

2.5 Routine, Preventive, Breakdown & Capital Maintenance:

- Routine and preventive maintenance shall include such checks and maintenance activities round the clock on hourly, shift wise, daily, weekly, fortnightly, monthly, quarterly, half yearly, and yearly basis which are required to be carried out on all the components of

the power plant to minimize breakdowns and to ensure smooth and trouble free running of the power plants. The supplier shall be responsible to carry out routine and preventive maintenance and replacement of each and every component / equipment of the power plant and he shall provide all labour, material, consumables etc. for routine and preventive maintenance at his own cost.

Breakdown maintenance shall mean the maintenance activity including repairs and replacement of any component or equipment of the power plant which is not covered by routine and preventive maintenance and which is required to be carried out as a result of sudden failure/breakdown of that particular component or equipment while the plant is running. The supplier shall be responsible to carry out breakdown maintenance of each and every component of the power plant and he shall provide the required manpower, materials, consumables, components or equipment etc. for breakdown maintenance at his own cost irrespective of the reasons of the breakdown/failure.

Capital maintenance shall mean the major overhaul of any component or equipment of the power plant which is not covered by routine, preventive and breakdown maintenance which may become necessary on account of excessive wear & tear, aging, which needs repair/replacement. The capital maintenance of power plant and all civil structures shall normally be planned to be carried out on an annual basis. For this purpose a joint inspection by the supplier and purchaser shall be carried out of all the major components of the power plant, about two months in advance of the annual maintenance period, in order to ascertain as to which components of the power plant require capital maintenance. In this regard the decision of the purchaser will be final and binding. However, if the condition of any plant and component warrants its capital maintenance at any other time, a joint inspection of the purchaser and supplier shall be carried out immediately on occurrence of such situation and capital maintenance shall be carried out by arranging the shutdown of the plant/part of the plant, if required, in consultation with concerned authorities. The decision of the purchaser shall be final and binding.

Penalty for non renewal of insurance: The penalty amounting to Rs. 500/- per day will be imposed on the firm in the absence of insurance policies for men, machinery and all parts. In case of any damage / loss / mishappening occurs in the absence of insurance policies than the firm will be responsible for the same.

Monthly generation submission format is given at ANNEXURE- F

SECTION -F
(FINANCIAL BID)

Price Bid

Name of Work:-

Design, Manufacture, Supply, Erection, Testing and Commissioning Including Warranty, Operation & Maintenance for 10 Years for Total Aggregate Capacity of 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh

Due On: 12.08.2022

Approx. Value:- Rs. 11.5 Cr (GST extra)

Earnest Money:- Rs. 23 Lac

Time Limit

**- 5 months for part A
-10 years for part B**

Sr. No.	Description	Qty.	Rate/system	Amount
1.	2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh.			
PART-A 1.1	Design, Manufacture, Supply, Erection, Testing & Commissioning along-with 10 years warranty for 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh alongwith 2 No.s Package substation with Dry type 1000 kVA, 415V/11kV, 50Hz, step up transformer alongwith all protections, switchgears, required vacuum circuit breakers (630 Amps), RMU panel/H-Pole, Metering panel and cables etc alongwith required civil work as per requirement and Cost of structure duly designed by structure engineer capable of bearing wind speed of 170 km per hr for 2000kWp SPV Power Plant along with all civil works	1 No. Job		
PART-B 2.1	Operation & Maintenance for the 2000kWp Canal Top SPV Power Plant With High Power Evacuation on HT Side at N-Choe near Garden of Conifers, Sector-52, Chandigarh and the cost of replacement of all the parts covered under Guarantee period of 10 years from the date of commissioning of the Power Plant as per scope mentioned in the DNIT along with Operation & Maintenance of Structure of Parking area and Operation & Maintenance of High Power evacuation System with Package substation of minimum 2X1000 KVA for 10 years from the date of commissioning of the Power Plant NOTE: The O&M charges for 10 years (part B) shall not be less than 10% of the capital cost (Part A). In case the bidder quoted the O&M charges for 10 years (part B) is less than 10% of the capital cost (Part A), then the bid will be liable to be rejected.	1 No. Job		
	Total in Figures			
	Total in Words			

- Rates quoted will be exclusive of GST.
- The Lowest Bid L-1 will be calculated by adding the Capital Cost of the project (Part A) + the Cost of Operation and Maintenance (O&M) of the Canal Top SPV Power Plant for 10 years (Part B).
- The bidder must fill Annexure D of this DNIT and load it along with the price bid.
- If the adequate space is not available on a the roof of mentioned site for any reason, the value of the Work Order will be reduced on proportionate rate (per watt basis) and the revised Work Order will be issued to the party accordingly.
- In case there is difference in total figure and words, then the total made in figures will be considered.

ANNEXURES

(A TO F)

Annexure – A

TECHNICAL DETAIL FORM

Sr. No.	ITEM	PARTICULARS
	SOLAR PHOTOVOLTAIC MODULES	
1.1	<u>Option-1</u> Make: Model No.: Wattage: Module Efficiency %(if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	
1.2	<u>Option-2</u> Make: Model No.: Wattage: Module Efficiency %(if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	
1.3	<u>Option-3</u> Make: Model No.: Wattage: Module Efficiency %(if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	
2	POWER CONDITIONING UNITS	
2.1	<u>Option-1</u> Make: Model No.: Rated Capacity: Maximum Efficiency: (if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	
2.2	<u>Option-2</u> Make: Model No.: Rated Capacity: Maximum Efficiency: (if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	
2.3	<u>Option-3</u> Make: Model No.: Rated Capacity: Maximum Efficiency: (if, bidder is not the manufacturer, Authorization letter from Manufacturer to be enclosed)	

Signature of the Bidder _____

Business Address _____

- **Note: CREST is free to select any one of SPV module and Power Conditioning Unit from the above three or more brands quoted by the bidders.**

Annexure – C

BG No. -----

Date of Issue-----

Date of Expiry-----

FORM OF PERFORMANCE GUARANTEE/BANK GUARANTEE BOND

In consideration of the U.T Administration, Chandigarh (hereinafter called “The Government”) having offered to accept the terms and conditions of the proposed agreement between M/s.....(hereinafter called “the said contractor(s)” and **Chandigarh Renewable Energy and Science & Technology Promotion Society (CREST)** (hereinafter called “CREST”) for the work order issued vide _____ (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for Rs.....(Rupeesonly) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We.....(hereinafter referred to as the “Bank”) hereby undertake to pay to the Chandigarh Renewable Energy and Science & Technology Promotion Society (CREST) an amount not exceeding Rs..... (Rupees.....only) on demand by the CREST.

2. We.....do hereby undertake to pay the amounts due and payable under this Guarantee without any demur, merely on a demand from the CREST stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs..... (Rupees.....only).

3. We, the said Bank, further undertake to pay to the CREST any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under, and the contractor(s) shall have no claim against us for making such payment.

4. We.....further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the

performance of the said agreement, and it shall continue to be enforceable till all the dues of the CREST under or by virtue of the said agreement have been fully paid, and its claims satisfied or discharged, or till the CEO, CREST, on behalf of the CREST, certifies that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor(s), and accordingly discharges his guarantee.

5. We.....further agree with the CREST that the CREST shall have the fullest liberty without our consent, and without effecting in any manner our obligations hereunder, to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the CREST against the said contractor(s), and to forbear or enforce any of the terms and conditions relating to the said agreement, and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the CREST or any indulgence by the CREST to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This Guarantee will not be discharged due to the change in the constitution of the bank or the contractor(s).

7. We.....lastly undertake not to revoke this (indicate the name of the bank) Guarantee except with the previous consent of the CREST in writing.

8. This Guarantee shall be valid up to.....unless extended on demand by the CREST. Notwithstanding anything mentioned above, our liability against this Guarantee is restricted to Rs.....(Rupeesonly), and unless a claim in writing is lodged with us on or before _____ on the date of expiry or extended date of expiry of this Guarantee all liabilities under this Guarantee shall stand discharged.
Dated the..... day of.....For.....

Annexure – D
COST BREAK-UP OF CANAL TOP SPV POWER PLANT OF 2000kWp

Sl. No.	Brief Description	Units	Qty	Rate (Rs.)	Amount (Rs.)
1	SPV modules for a total capacity 2000kWp as per specifications.				
2	SPV module mounting structure/ alongwith civil work for accommodating 2000kWp capacity SPV modules as per specifications.				
3	Power Conditioning Units / String Inverters as per specifications				
4	Data Logging system along with sensors as per specifications				
5	ACDB, SPD Box, Breaker etc.				
6	Uni- Directional and Bi-directional Energy Meters				
7	Robotic Cleaning and Fire Extinguisher				
8	Balance of Systems				
9.	Operation & maintenance of the 2000kWp Canal Top SPV Power Plant including cost of replacement of all the parts for a period of 10 years from the date of commissioning the power plant as per scope mentioned in the DNIT.				
10.	High Voltage Power evacuation system with substation with Dry type of minimum 2X1000 kVA, 415V/11kV, 50Hz step up transformer alongwith all protections, switchgears, required vacuum circuit breakers (630 Amps), RMU panel/H-Pole, Metering panel and cables etc alongwith required civil work as per requirement.				
11.	Operation & Maintenance of High Power evacuation System with substation for 10 years from the date of commissioning of the power plant.				
12.	Installation & Commissioning of the Canal Top SPV Power Plant				
13.	Fencing and Paving of the whole plant				
14.	Any other item				
	TOTAL				

Annexure – E

MANUFACTURERS' AUTHORIZATION FORM

No. _____

dated:

To

Dear Sir:

We _____ who are established and reputable manufacturers of _____ (*name & descriptions of goods offered*) having factories at _____ (*address of factory*) do hereby authorize M/s _____ (*Name and address of Agent*) to submit a bid, and sign the contract with you for the goods manufactured by us against the above IFB.

We hereby extend our full guarantee and warranty for the goods and services offered for supply by the above firm against the following site:-.

SR. NO.	SITE NAME	CAPACITY OF SPV POWER PLANT
1	N-Choe near Garden of Conifers, Sector-52, Chandigarh	2000kWp
TOTAL		2000kWp

(Name of manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer and should be signed by a person competent and having the power of attorney to legally bind the manufacturer. It should be included by the Bidder in its bid.

(The list of items for which this is required should be indicated by Purchaser).

Annexure – F

Monthly generation submission format

Name of site		Capacity (kWp)	Month of Reading			
S.No	Date	Generation (kWh) after Multiplying Factor (if any)	Grid Down time (9AM to 4PM only)			Remarks
			* Exact time may be mentioned			
			Time of shut Down (if any)	Total (Hrs)	Generation during shut down as per DNIT (Total Hrs x 0.5 x Capacity)	
1						
2						
3						

Name of O&M Engineer		
Insurance of Plant Valid upto	Date	Policy Number
Insurance of Manpower valid Upto	Date	Policy Number
Multiplying Factor if any	MF	
Attendance sheet		

Annexure – G

Module Mounting Structure design alongwith Foundation design

(To be uploaded separately)

Signature Not Verified

Digitally signed by Prem Kumar
Date: 2022.07.15 16:07:22 IST
Location: Chandigarh