

**GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT**

TENDER DOCUMENT

Name of Work:-: Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

Estimated Cost	:	Rs.32,56,800/-
Earnest Money	:	Rs.65,136/-
Performance Guarantee	:	5% of tendered value or estimated cost put to tender (ECPT) (whichever is higher). (b) Where the tendered amount is less than eighty percent (80%) of the estimated cost put to tender (ECPT), the performance guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount
Security Deposit	:	@ 2.5% of Tendered value
Completion Period	:	3 Months
NIT No.	:	26/EE(E)/JED/CPWD/2026-27
Last date for Submission of Bid Document	:	Upto 15.00 pm on 01.09.2026

This NIT containing page 01 to 54 approved for **Rs.32,56,800/-** (Rs Thirty Two Lakh Fifty Six Thousand Eight Hundred Only)

Assistant Engineer (E)-P
CPWD, Jalandhar(Pb)

Executive Engineer (E)-Jalandhar
CPWD, Jalandhar(Pb)

Name of work :- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

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INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING FORMING PART OF NIT AND TO BE POSTED ON WEBSITE

The Executive Engineer (E) - Jalandhar. CPWD, Kendriya Sadan, Surya Enclave, Jalandhar (Pb). (Telephone No. 0181-2420811 & Email id: jaleee.cpwd@gov.in) on behalf of President of India, invites Online percentage rate bids in two bid system from From the Eligible Contractors as per OM No. DG/Enlist. Rules-2026/Misc/01 Dated – 31/12/2025, enlisted in CPWD in the appropriate class in Building & Road Category and specialized firms/agencies.

S. No.	NIT No.	Name of work & Location	Estimated cost put to bid	Earnest Money	Period of Completion	Last date of online submission Of bid, copy of receipt of deposition of original EMD and other documents as specified in the bid document.	Time & date of opening of eligibility bid
1	2	3	4	5	6	7	8
	26/EE(E)/JED/CPWD/2026-27	Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar	Rs.32,56,800/-	Rs.65,136/- (To be returned after receiving Performance Guarantee)	3 Months	Up to 15:00 pm on 01.09.2026	Up to 15:30 pm on 01.09.2026

Contractors Building & Road category Contractors either himself or Associates specialized agency who fulfils the following requirements shall be eligible to apply. **Or** Specialized agency/ firm who fulfils the following requirements shall be eligible to apply.

Joint ventures are not accepted.

- a) Should have satisfactory completed the works as mentioned below during the last 7 (seven) years ending **last day of month previous to the one in which tenders are invited.**

Three similar works each costing not less than Rs. **13,02,720/-** Or Two similar works each costing not less than **Rs19,54,080/-** Or One similar work costing not less than Rs. 26,05,440/- Similar works shall mean **“SITC of Solar Power Plant system”**.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of tenders.

- (b) Should have had average Annual Financial Turn Over (gross) of not less than 30% of Estimated cost put to tender on construction works during the immediate last three consecutive Financial years ending on 31st March 2026. This should be duly audited by Chartered Accountants **(Applicable for Non-CPWD Contractors)**.
- (c) Should not have incurred any loss (profit after tax should be positive) in more than two years during the last five consecutive Financial years ending 31st March 2026 duly audited and certified by the Chartered Accountant. (scanned copy of certificate from CA to be uploaded). The balance sheet in case of Pvt/Public Ltd company means its Standalone Finance Statement and Consolidated Financial Statement both) **(Applicable for Non-CPWD Contractors)**.
- (d) **Should have Net worth** of minimum 10% of Estimated cost put to tender certified by chartered accountant (Scanned copy of original Net worth Certificate issued by Certified Chartered Accountant in Form B-1 to be uploaded) or Should have Bank Solvency Certificate of equal to 40% of Estimated cost put to tender certified by solvency issuing bank on bank (Scanned copy

of original Bank Solvency Certificate issued by the Bank in Form B to be uploaded). **(Applicable for Non-CPWD Contractors).**

2. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
3. Information and instructions for bidders posted on website shall form part of bid document.
4. **The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.**
5. The bid can only be submitted after deposition of original EMD either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission and uploading the mandatory scanned documents such as **Insurance Surety Bonds / Account Payee Demand Draft or Banker's Cheque or Fixed Deposit Receipt (FDR) or/ and Bank Guarantee (For Balance amount as prescribed) from any of the Commercial Bank** towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for deposition of original EMD to division office of any Executive Engineer(including NIT issuing EE/AE), CPWD and other documents as specified.
6. **Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered/update their profile beforehand. The necessary training materials including the videos with step to step process available on download section of <https://etender.cpwd.gov.in>.**
7. **The intending bidder must have valid class-III digital signature certificate with encryption key(combo type) to perform any operations/transactions on the e-tendering portal/website and the bidder should download and install the eMSigner on their system as per instructions available on download section of <https://etender.cpwd.gov.in>**
8. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
9. Contractor can upload documents in the form of JPG format and PDF format.
10. Certificate of Financial Turn over: At the time of submission of bid, contractor may upload Affidavit/ Certificate from CA mentioning Financial Turnover of last 3 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.
11. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO). However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
12. The "Eligibility Bid" shall be opened first on due date and time as mentioned above. The time and date of opening of "Financial Bid" of bidders qualifying the eligibility bid shall be communicated to them at a later date. The financial bid shall be opened at the notified time, date & place. The bidders or their representatives may remain present in the office of tender opening authority.
13. Pre bid conference shall be held in the Office of at ...*...Hrs. on ...*... to clear the doubt of intending bidders, if any.
14. The department reserves the right to reject any or all bids without assigning any reason thereof and may restrict the list of qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the minimum laid down criteria.
15. After submission of the bid, the bidder can re-submit revised bid any number of times but before last date and time of submission of bid as notified. While submitting the revised bid, bidder can

revise the quoted rates of one or more items any number of times but before last date and time of submission of bid as notified.

List of Documents to be Uploaded within the period of tender submission:-

1. Insurance Surety Bond, Demand Draft/ Account Payee Banker's Cheque / FDR/ E-Bank Guarantee of any commercial Bank against EMD.
2. Earnest Money in the form of Insurance Surety Bonds / Account Payee Demand Draft / Fixed Deposit Receipt / Banker's Cheque or E-Bank Guarantee (for balance amount as prescribed) from any of the commercial banks (drawn in favour of **Executive Engineer, Jalandhar Central Division, CPWD Jalandhar**) shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT. This receipt shall also be uploaded to the e-tendering website by the intending bidder up to the specified bid submission date and time. EMD receipt Proforma "A" enclosed.
3. **Enlistment Order** of the Contractor in CPWD
4. Certificate of work experience (Form'C')
5. Solvency Certificate or Networth Certificate – Solvency of the amount equal to 40% of the estimated cost put to tender (Form 'B').OR Networth Certificate of minimum 10% of the estimated cost put to tender issued by certified Chartered Accountant. (Form 'B-1').
6. Certificate of Financial Turnover from CA (Form 'A')
7. **Copy of Electrical license of eligible class of the bidder.** In case, bidder doesn't have electrical license, he shall submit **an undertaking** that "I/We will either obtain valid electrical license at the time of execution of electrical work or associate contractors having valid electrical license of eligible class." (Form-ii)
8. **GST Registration Certificate, if already obtained by the bidder.**

If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking along with bid documents.

"If work is awarded to me, I/we shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any Payment by CPWD, whichever is earlier, failing which I/we shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard". (Form-i)
9. ERP Training Certificate
10. Permanent Account Number (PAN) as issued by the Income Tax department
11. Any other Documents as specified in the NIT.

Note: 1. under S.No. 8 it is informed that "GST registration certificate" is to be of "Punjab" state. In case the bidder has certificate of registration of GST of some other state then that registration shall not be considered and thus the bidder must upload the undertaking to avoid disqualification

Assistant Engineer(E)-P
CPWD, Jalandhar(Pb)

Executive Engineer(E)- Jalandhar
CPWD, Jalandhar(Pb)

FORM “I”

Undertaking regarding obtaining GST registration Certificate

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If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by the CPWD, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard.

Officer of the firm with stamp

Signature of Bidder(s) or an authorized

“FORM-ii”

UNDERTAKING CERTIFICATE FROM CONCERNED CONTRACTOR HAVING NOT VALID ELECTRICAL LICENSE OF ELIGIBLE CLASS

Name of Work: - Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

Undertaking that “I/ We will either obtain valid electrical license at the time of execution of electrical work or associate contractor having valid electrical license of eligible class”.

Date

Signature of Contractor

(FORM 'A')
FINANCIAL INFORMATION

- I. Financial Analysis - Details to be furnished duly supported by figures in balance sheet / Profit and Loss account for the last five years duly certified by the Chartered Accountant as submitted by the Applicant to the Income - Tax Department (copies to be attached). (The balance sheet in case of Pvt./ Public Ltd. Company means its standalone finance statement and consolidated financial statement both) **(copies to be attached)**.

Years

Particulars	2020-21	2021-22	2022-23	2023-24	2024-25	2026-27
i) Gross Annual turnover on construction works.*						
ii) Profit (After tax) /Loss.*						

*

The bidder should give information strictly in above format.

- II. Financial arrangements for carrying out the proposed work.
- III. Networth Certificate from Chartered Accountant of the bidder in the prescribed Form "B-1".

Signature of Accountant with Seal

Signature of Bidder(s).

FORM "B"

FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that M/s. Sh.....having marginally noted address, a customer of our bank are/is respectable and can be treated as good for any engagement upto a limit of Rs.....) This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature)
For the Bank

NOTE:- (1) Bankers certificates should be on letter head of the Bank, sealed in cover addressed to tendering authority.
(2) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM "B-1"

FORM FOR CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT

"It is to certify that as per the audited balance sheet and profit and loss account during the financial year 2026-27, the net worth of M/s (Name & Registered address of individual/ firm/ company). As on(the relevant date) is Rs. after considering all liabilities. It is further certified that the Net worth of the company has not eroded by more than 30% in the last three years ending on the relevant date.

Signature of Chartered Accountant.....
Name of Chartered Accountant
Membership no. of ICAI.....
Date and Seal.....

FORM 'C'

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST SEVEN YEARS ENDING LAST DAY OF MONTH PREVIOUS TO THE ONE IN WHICH TENDERS ARE INVITED.

Sl. No.	Name of work / project and location	Owner or sponsoring organization	Cost of work in Crores of rupees	Date of Commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation / arbitration cases pending/ in progress with details*	Name and Address (Postal & E-mail) / telephone number of officer to whom reference	Whether the work was done on back to back basis Yes / No
1	2	3	4	5	6	7	8	9	10

* Indicate gross amount claimed and amount awarded by the Arbitrator.

Signature of Bidder(s)

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORMS "C"

1. Name of work/project & location
2. Agreement no.
3. Estimated cost
4. Tendered cost
5. Date of start
6. Date of completion
 - (i) Stipulated date of completion
 - (ii) Actual date of completion
7. Amount of compensation levied for delayed completion, if any
 - (a) Whether case of levy of compensation for delay has been decided or not: Yes/No
 - (b) If decided, amount of compensation levied for delayed completion, if any
8. Amount of reduced rate items, if any
9. Performance Report

(1) Quality of work	Outstanding/Very Good/Good/Poor
(2) Financial soundness	Outstanding/Very Good/Good/Poor
(3) Technical Proficiency	Outstanding/Very Good/Good/Poor
(4) Resourcefulness	Outstanding/Very Good/Good/Poor
(5) General Behaviour	Outstanding/Very Good/Good/Poor

Dated:

Executive Engineer or Equivalent

Eligibility Criteria for E&M associate firms

Name of Work: Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

SI No.	Description/ Type of work	The firm should be	Estimated cost put to tender for the component	Similar Work Definition	Remarks
	1	2	3	4	5
1	Rooftop Solar Power Plants	Specialized agency with appropriate experience credentials as specified under Three similar works each of value not less than 40% of the estimated cost put to tender for the component Or Two similar works each of value not less than 60% of the estimated cost put to tender for the component Or One similar works each of value not less than 80% of the estimated cost put to tender for the component	Rs.32,56,800/-	“Similar Work Shall mean Supply , Installation , testing & commissioning of Solar” under one agreement.	The firm should submit details of experience, credentials & other necessary documents as required by department for approval.

- The values of executed work shall be brought to current costing level by enhancing the actual value of work at simple rate of interest of 7% per annum, calculated from the date of completion to the previous day of last date of submission of tenders.
- Cost of components of work executed other than those mentioned in definition of similar work shall be deducted while arriving at the value of similar work for eligibility. Associate Contractor shall submit self certified abstract of cost of similar components along with supporting documents.
- The decision of the Department in approval of associate agency shall be final and binding on the contractor.

SPECIAL CONDITIONS FOR ASSOCIATION FOR SPECIALIZED E & M CONTRACTOR

The 1st lowest tenderer (main firm) has to submit the following documents for association of eligible E&M contractors within 15 days from the date of commencement of work.

1. The applicant should submit the willingness from eligible E&M contractors to get associated with the applicant for execution of each E&M components of work in wholesome manner and as per the conditions set out in the MOU to be entered into between the one who is awarded the work and the associated eligible E&M contractors.
2. In support of the eligibility conditions of the proposed associated E&M contractors, copy of their registration documents, Electrical Contractor's License, GST Documents, Work experience certificates and other documents as required in the eligibility conditions duly attested by the applicants (Main Contractor and associate contractors) shall be submitted to the EE(E) who will submit these documents to the **competent authority** for deciding the eligibility. Each such an E&M contractor will certify that they are not debarred as on the day of application for sale of tender.
3. The main contractor will submit MOU (for each package) signed with eligible registered contractors of CPWD /specialized E&M contractors. The MOU in the enclosed form shall be signed by both the parties i.e. main contractor as 1st party and associated E&M contractor as 2nd party.
4. In the event of the concerned E&M agency not performing satisfactorily or failure of associate contractor to complete the E&M work, the main contractor on the written direction of the department, shall remove the Associate contractor deployed on the work and shall submit name of new associate who fulfill the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Such associates shall also enter into tripartite Agreement/Contract along with the main tenderer and the departmental officer and shall meet the entire guarantee for the equipment's already supplied for which payment has been released by the Deptt. in part. If any equipment supplied for the work, during the currency of the earlier Associate contractor and paid partly by the deptt. ,becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of E&M Contractor will be allowed without prior approval of the Engineer-in-charge of respective component.
5. Executive Engineer (E) shall be the Engineer-in-charge as far as E&M works are concerned. Separate tender schedule abbreviated CPWD-7 and Conditions for E&M Works are appended with this tender It will be obligatory on the part of the contractor/ tenderer to sign the tender documents for all the component parts.
6. The main contractor shall be responsible and liable for proper and complete execution of all the E&M works and ensure coordination and completion of both civil and E&M works.
7. The associate contractor shall attend the inspection of the work by the Engineer-in-Charge of E&M works as and when required.

MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

(TO BE SUBMITTED BEFORE AWARD OF WORK)

- 1] M/S [Name of the firm with full address) Enlistment Status
Valid Upto:
[Henceforth called the main contractor]
And
- 2] M/S [Name of the firm with full address) Enlistment Status
Valid Upto:
[Henceforth, called Associated Electrical Contractor or Electrical Contractor]

Name of Work:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

[Electrical Component only] as per schedule, specifications, terms and conditions of the tender.

We state that M.O.U between us will be treated as an agreement and has legality as per Indian Contract Act [amended upto date] and the department [CPWD] can enforce all the terms and conditions of the agreement for execution of the above work. Both of us shall be responsible for the execution of work as per the agreement to the extent this MOU allows. . Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits. In case of any dispute, either of us will go for mediation by the EE (E), CPWD, Jalandhar. Any of us may appeal against the mediation to the SDG, CPWD, Chandigarh. His decision shall be final and binding on both of us. We have agreed as under:

The associated electrical contractor will execute all electrical works in the wholesome manner as per terms and conditions of the agreement. Any type of internal transaction between the electrical contractor and main contractor shall be as per their convenience and mutual understanding without involving the department. Security deposit shall be deducted as per agreement.

1. The electrical contractor shall be liable for disciplinary action and other legal actions as per agreement if he fails to discharge obligation as per this agreement besides forfeiture of the security deposit.
2. All the machinery and equipments, tools and tackles required for execution of the electrical works. As per agreement shall be the responsibility of the electrical contractor. The site staff required for the electrical work shall be arranged by the electrical contractor as per terms and conditions of the agreement.

SIGNATURE OF MAIN CONTRACTOR

Date

Place

SIGNATURE OF ASSOCIATED
ELECTRICAL CONTRACTOR

Date

Place

COUNTERSIGNED EXECUTIVE ENGINEER (E)

WILLINGNESS CERTIFICATE

Name of Work:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

I hereby give my willingness to work as associated contractor for the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-charge. Also I will employ full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Date:

Signature of Contractor

Receipt of Deposition of Original EMD

(Receipt No./Date.....)

Name of Work	Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar	
NIT No.	26/EE(E)/JED/CPWD/2026-27	
Estimated Cost	Rs.32,56,800/-	
Amount of Earnest Money Deposit	Rs.65,136/-	
Last date of submission of Bid	01.09.2026	
(*To be filled by EE(E) at the time of issue of NIT and uploaded alongwith NIT).		
Name of contractor		
Amount of original E-Bank Guarantee Earnest Money Deposit		
Date of submission of EMD		
Contractor's email id		
Contractor's Mobile no		

Signature, Name and Designation of EMD
Receiving officer (EE/AE(P)/AE/AAO) Along with office stamp

* To be filled by EE inviting tender

#To be filled in by EMD receiving AE

Note: -

1. The Executive Engineer of all divisions including NIT issuing division / sub-division of CPWD should receive the original EMD for tender of other division.
2. The NIT approving authority / EE at the time of issue of NIT shall also fill and upload the above prescribed format of receipt of deposition of original EMD along with NIT.
3. The Executive Engineer receiving EMD in original form shall examine the EMD deposited by the bidder and shall issue a receipt of deposition of earnest money to the agency in a given format uploaded by tender inviting EE. The receipt may be issued by the AE(P)/AE/AAO.
4. The Executive Engineer receiving original EMD shall also intimate tender inviting Executive Engineer above deposition of EMD by the agency by email/fax/telephonically.
5. The original EMD receiving Executive Engineer shall release the EMD after verification from the e-tendering portal website (www.etender.cpwd.gov.in> tender free view > advance search > awarded tenders) that the particular contractor is not L-1 tenderer and work is awarded.
6. The tender inviting Executive Engineer will call for original EMD of the L-1 tenderer from EMD receiving Executive Engineer immediately.

CPWD-6 FOR e-TENDERING

	GOVERNMENT OF INDIA CENTRAL PUBLIC WORKS DEPARTMENT	
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The Executive Engineer (E) - Jalandhar. CPWD, Kendriya Sadan, Surya Enclave, Jalandhar (Pb). (Telephone No. 0181-2420811 & Email id: jaleee.cpwd@gov.in) on behalf of President of India, invites Online percentage rate bids in two bid system from From the Eligible Contractors as per OM No. DG/Enlist. Rules-2026/Misc/01 Dated – 31/12/2025, enlisted in CPWD in the appropriate class in Building & Road Category and specialized firms/agencies.

Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

The enlistment of the contractors should be valid on the last date of submission of bids.

In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

- 1.1 The work is estimated to cost **Rs.32,56,800/-**. This estimate, however, is given merely as a rough guide.
 - 1.1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids. For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.
 - 1.2 Intending bidders is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-
Criteria of eligibility for submission of bid documents
 - 1.2.1 Conditions for Non-CPWD registered contractors only, if bids are also open to non-CPWD Contractors.
For works estimated cost up to tendering limit of class -I Buildings & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However, for Horticulture category, it may be modified as per bidding limit of CPWD class I contractors of Horticulture category).
 - (i) Three similar works each of value not less than Rs..... or two similar works each of value not less than Rs..... or one similar work of value not less than Rs..... (all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited.
 - (ii) For EPC tender under Mode- I/II only (Applicable for CPWD enlisted contractors of appropriate class also).
One completed work costing not less than Rs. executed with the structural system technology as proposed by bidder in the letter of transmittal during the last 7 years ending last day of the month previous to the one in which tenders are invited. This work can be part of eligible work at 1.2.1 (i) above or as a separate work.
- Note:-
For works costing above tendering limit of class -II Buildings & Roads(erstwhile Composite/ Building/ infrastructure)category contractors but up to tendering limit of Class-I Buildings & Roads(erstwhile Composite/ Building/ infrastructure) category Contractor (However, for Horticulture category, it may be modified as per bidding limit of CPWD class II and CPWD Class I contractors respectively of Horticulture Category) when bids are open to non-CPWD contractors also, then class II contractors of CPWD registered shall also be eligible if they satisfy the eligibility criteria specified in 1.2.1 above.
- 1.2.2 Criteria of eligibility for CPWD as well as non-CPWD contractors,

For works estimated to cost above the tendering limit of class -I (Super) Buildings & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However for Horticulture category, it may be modified as per bidding limit of CPWD class I contractors of Horticulture Category).

- (i) Three similar works each of value not less than Rs..... or two similar works each of value not less than Rs.....or one similar work of value not less than Rs.....(all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited.
- (ii) For EPC tender under Mode- I/II only (Applicable for CPWD enlisted contractors of appropriate class also). One completed work costing not less than Rsexecuted with the structural system technology as proposed by bidder in letter of transmittal during the last 7 years ending last day of the month previous to the one in which tenders are invited. This work can be part of eligible work at 1.2.2 (i) above or as a separate work.
The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid. This is applicable for 1.2.1 as well as 1.2.2 (Para 1.2.1(i) and Para 1.2.2(i) are not applicable for CPWD enlisted contractors of appropriate class. Para 1.2.1(ii) and Para 1.2.2(ii) are also applicable for CPWD enlisted contractors of appropriate class).

To become eligible for issue of bid, the bidders shall have to furnish an affidavit as under:-

I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid)

- 1.2.3 When bids are invited from non CPWD contractors and CPWD class II contractors as per provisions of clause 1.2.1 above, it will be mandatory for non CPWD contractors and CPWD class-II contractors to upload the work experience certificate(s) and the affidavit as per the provisions of clause 1.2.2.

But for such bids, Class-I contractors of CPWD are eligible to submit the bids without submission of work experience certificate and affidavit. Therefore, CPWD class-I contractors shall upload two separate letters for experience certificate and affidavit that these documents are not required to be submitted by them. Uploading of these two letters is mandatory otherwise system will not clear mandatory fields.

2. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7/8 (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website www.cpwd.gov.in. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be **3 Months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.

4. The site for the work is available.

OR

The site for the work shall be made available in parts as specified below:-

.....

- ii) The architectural and structural drawing for the work is available or

5. The architectural and structural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and

conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.

6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
8. When bids are invited in three stage system and if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the bid submitted earlier shall become invalid.
9. Earnest Money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or E-Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks (**drawn in favour of Executive Engineer, Jalandhar Central Division, CPWD Jalandhar**) shall be scanned and uploaded on the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

A part of earnest money is acceptable in the form of e-Bank Guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of E-Bank Guarantee of any Commercial bank having validity for a period of 90 days for single bid works and 180 days for two bid system or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two/ three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. should be returned within 30 days of declaration of result of technical bid evaluation.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the notice inviting e- tender shall be scanned and uploaded on the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in e- tender notice shall have to be submitted by the lowest bidder within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any division of CPWD and other documents scanned and uploaded are found in order.

The bid submitted shall be opened at 03:30 PM on **01.09.2026**

10. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:
 - (i) The bidder is found ineligible.
 - (ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.
 - (iii) 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 lowest bidder in the office of bid opening authority.
 - (iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

11. The contractor whose bid is accepted will be required to furnish performance guarantee at specified percentage of the tendered amount as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or E-Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form.. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work within the period specified in Schedule F.

12. **The description of the work is as follows:**

Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to bid for works in the CPWD Circle (Division in case of contractors of Horticulture/Nursery category) responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazette officer in the Central Public Works Department or in the Ministry of Housing and Urban Affairs. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed

to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.

18. The bids for the work shall remain open for acceptance for a period of 30 (thirty) days from the date of opening of bids in case of single bid system and 75 (seventy five) days from the date of opening of technical bids in case bids are invited in 2 or 3 bid system.
- Further
- (i) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department within 7 days after last date of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.
 - (ii) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department after expiry of 7 days after last date of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.
 - (iii) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidders shall not be allowed to participate in the rebidding process of the same work.
19. This notice inviting Bid shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
- (a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - (b) Standard C.P.W.D. Form 7/8 or other Standard C.P.W.D. Form as applicable.
20. The intending bidders are required to update their profile in CPWD e- tender portal and to upload their bids well in advance of last date of submission of tender. Any issue related to updating profile/uploading tender can be resolved through the concerned Executive Engineer/ Assistant Engineer (Phone no *....., e- mail Id *.....) or ERP helpline no. 18001803286 or e-mail Id cpwd.support@techmahindra.com. The e-tendering bidders are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.

Assistant Engineer (E) P
CPWD, Jalandhar(Pb)

Executive Engineer(E)-Jalandhar
CPWD, Jalandhar(Pb)

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT

STATE : Punjab
BRANCH : E & M
Region : Chandigarh

CIRCLE : JC
DIVISION : JED
SUB-DIVISION : Amritsar

Percentage rate Tender & Contract for Works

Tender for the work of:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

To be submitted by 15.00 hours on to the **Executive Engineer (E)- Jalandhar, CPWD, Jalandhar (Pb).**

(ii) To be opened in presence of tenderers who may be present at 15.30 hours on in the office of the **Executive Engineer (E)- Jalandhar, CPWD, Jalandhar (Pb).**

T E N D E R

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 & 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 respect with the specifications, designs, drawing 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 respect of accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for Thirty (30) days from the due date of its opening in case of single bid system Seventy Five (75) days from the date of opening of technical bid in case tenders are invited on 2 /3 bid/ system for specialized work and not to make any modification in its terms and conditions.

I/We have deposited EMD for the prescribed amount in the office of concerned Executive Engineer as per the bid document.

A copy of earnest money deposit **receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed)** issued by a **Commercial Bank**, is scanned and uploaded (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, 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 work as specified, I/ We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said

performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to

those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in CPWD in future forever. Also, if such a

violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

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 authorized to communicate the same or use the information in any manner prejudicial to the safety & integrity of the State.

Dated
Witness:
Address:
Occupation:

Signature of Contractor
Postal Address

ACCEPTANCE

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

The letters referred to below shall form part of this contract Agreement:-

i)

.....

ii)

iii)

For & on behalf of the President of India.

Signature

Dated

Designation

PROFORMA OF SCHEDULES

(Separate Performa for Civil, Elect. & Hort. Works in case of composite Tenders)

SCHEDULE 'A'

Schedule of quantities (as per PWD-3)

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

S.No.	Description of item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of issue
1	2	3	4	5
-----NIL-----				

SCHEDULE 'C'

Tools and plants to be hired to the contractor

S.No.	Description	Hire charges per day	Place of issue
1	2	3	4
-----NIL-----			

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any.

--As per Additional Specifications attached with Schedule----

SCHEDULE 'E'

Reference to General Conditions of contract.	General Conditions of Contract GCC Construction Work 2023 of CPWD as modified and corrected up to previous day of the last date of submission of the tender.
Name of work:	Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar
Estimated cost of work:	Rs.32,56,800/-
Earnest money :	Rs.65,136/- (To be returned after receiving Performance Guarantee)
Performance Guarantee:	5% of tendered value or estimated cost put to tender (ECPT) (whichever is higher). (b) Where the tendered amount is less than eighty percent (80%) of the estimated cost put to tender (ECPT), the performance guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount
Security Deposit :	2.5% of Tendered Value.

SCHEDULE 'F'

General Rules & Directions:		
Officer inviting tender		Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb).
Definitions:		
2(vi) Engineer-in-Charge		Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb).
2(viii) Accepting Authority		Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb).
2(x) Percentage on cost of materials and labour to cover all overheads and profits		15%
2(x)(b) Standard schedule of Rates		DSR - 2025 (E&M) with correction Slips up to last date of submission of bid.
2(xi) Department		Central Public Works Department.
9(ii) Standard CPWD contract form GCC 2023, CPWD form 7/8 as modified and corrected upto.....		Standard CPWD contract Form General Conditions of Contract Construction Works 2023, CPWD form 7 as modified and corrected up to previous day of the last date of submission of the tender.
Clause 1	i) Time allowed for Submission of performance guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or Proof of applying there of from the date of issue of letter of acceptance. ii) Maximum allowable extension with late fee @ 0.1% per day of performance guarantee amount beyond the period as provided in (i) above.....(1 to 15 days to be filled by NIT approving authority	07 Days. 03 Days.
Clause 2		
	Authority for fixing compensation under clause 2	Superintending Engineer- Jalandhar, CPWD Jalandhar(Pb)
Clause 5		Applicable
	Number of days from the date of issue of letter of acceptance for reckoning date of start Mile stone (s) as per table given below:-	7 days

Table of Milestone (s)

No	Description of Milestone (Physical)	Time allowed in days (From Date of start)	Amount to be withheld in case of non- Achievement of milestone
1	Submission of technical detail of all the materials i/c Solar Power Generation System and submission of drawing, Single line diagram etc.	0.5 months	1%
2	Supply of all material at site i/c Solar Power Generation System etc.	1.5 months	1%
3	Installation of all material at site i/c Solar Power Generation System etc.	2 months	1.5%
3	Testing commission and handing over of all system	03Months	1.5%

NOTE:

1. Withheld amount shall be released if and when subsequent milestone is achieved within respective time specified. However, in case milestones are not achieved by the Bidder for the work, the amount shown against milestone shall be withheld.

Time allowed for execution of work : **3 Month**

Authority to Decide:

- i) Extension of time : Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb).
- ii) Rescheduling of mile stones : Superintending Engineer Jalandhar CPWD, Jalandhar (Pb)
- iii) Shifting of date of start in case of delay in handing over of site : Superintending Engineer Jalandhar CPWD, Jalandhar (Pb)

PROFORMA OF SCHEDULES Clause 5 Schedule of handing over of site

Part	Portion of site	Description	Time Period for handing over reckoned from date of issue of letter of intent
Part A	Portion without any Hindrance	Full site for the work	On the day of issue of letter of commencement of work by the Engineer-in-charge
Part B	Portions with encumbrances	Nil	
Part C	Portions dependent on work of other agencies	Nil	
Clause 6: CMB/EMB/ ERP Based MB			
Mode of Measurement		ERP Based MB/ CMB	

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	10.00 Lakhs or as per decision of Engineer-in-charge
-----------------	--	--

Clause 7A	being eligible to interim payment. No running account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer- In-Charge.	Applicable
Clause 8A	Authority to decide compensation on account if contractor fails to submit Completion plans	Executive Engineer (Electrical), CPWD, Jalandhar or successor thereof
Clause 10A	List of testing equipment to be Provided by the contractor at site lab	As per direction of Engineer-in-charge and requirement at site
1.....	2.....	3.....
Clause 10B (ii)	Whether clause 10-B(ii) shall be applicable	No
Clause 10C	Component of labour expressed as percent of value of work	Not Applicable
Clause 10CC	Applicable /Not Applicable	Not Applicable
Schedule of component of other materials, Labour etc. for price escalation:		
Component of civil (except materials covered under clause 10CA) / Electrical construction value of work.		'Xm' Nil %
Component of labour - expressed as percent of total value of work.		'Y' Nil %
Clause 11	Specifications to be followed for execution of work	CPWD General specifications for Electrical works Part-I –VII and DSR & DAR E&M 2025 amended upto last date of submission of bid.
Clause 12	Type of work:-	Construction work
12.2	Deviation limit beyond which clauses 12.2 shall apply for electrical work.	100%
Clause 16	Competent Authority for deciding reduced rates.	Superintending Engineer Jalandhar CPWD, Jalandhar (Pb)
Clause 18	List of mandatory machinery, tools & plants to be deployed by the contractor at site.	All tools & plants as required to carry out the electrical work and as directed by the Engineer-in-charge and as required for timely execution of work
Clause 19C	Authority to decide penalty for each default	Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb.)
Clause 19D	Authority to decide penalty for each default	Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb.)
Clause 19G	Authority to decide penalty for each default	Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb.)
Clause 19K	Authority to decide penalty for each default	Executive Engineer(E)-Jalandhar CPWD, Jalandhar (Pb.)

Clause-25

1	Conciliator	SDG, Chandigarh, CPWD Chandigarh or successor thereof
2	Arbitrator appointing authority	Superintending Engineer-Jalandhar
3	Place of Arbitration	As decided by Arbitrator

Clause 32 Requirement of Technical Representative (S) and Recovery Rate:-

S.No.	Minimum Qualification of technical representative	Discipline	Designation (Principal Technical / Technical Representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision	
						Figures	Words
1	Graduate Engineer or Diploma Engineer	E & M	Project Manager cum Planning / Quality / Site / Billing Engineer	2 Years or 5 Years Respectively	1	Rs. 15000/- per month per person	Rupees Fifteen Thousand Rupees

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

Diploma holders with minimum 10 years relevant experience with a reputed construction agency/firm can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holder should not exceed 50 % of requirement of degree engineers

Clause-38 : NIL

- i) (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule Schedules of Rates printed by C.P.W.D.
- ii) Variations permissible on theoretical quantities

a) ~~Cement~~

~~For works with estimated cost _____ 3% plus / minus.~~

~~put to tender for more than Rs. 25 Lacs.~~

~~For Works with estimated cost put to~~

~~tender more than Rs. 25 Lakh _____ 2% plus / minus~~

b) ~~Bitumen for all work _____ 2.5% plus & only nil on minus side~~a) ~~Steel Reinforcement and structural~~

~~steel sections for each diameter,~~

~~section and category. _____ 2% plus / minus.~~

d) ~~All other materials. _____ Nil.~~**SAFETY MEASURES**

- 1.1 The issue of construction safety & standards has gained utmost importance in recent times. Contractors must follow highest safety standards and "ZERO" tolerance towards any violation of safety norms at the construction site. All workers of contractor and associate agencies, invariably and at all the times, must follow all safety norms, adopt safe construction practices and use all required safety gadgets in their working throughout the project duration.

Note : 1 The special conditions detailed above are in addition to general/ other/ additional conditions as specified elsewhere in tender document.

Note : 2 Nothing extra shall be paid on the account of these special conditions

(Guarantee Offered By Bank to CPWD In Connection With The Execution of Contracts)

Form of Bank Guarantee for Earnest Money Deposit/Performance Guarantee/Security Deposit/mobilization Advance

Whereas the **Executive Engineer(E)- Jalandhar, CPWD Jalandhar** on behalf of the President of India hereinafter called "The Government") has invited bids under (NIT Number) Dated for (name of work:-**Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar**

The Government has further agreed to accept irrevocable Bank Guarantee for Rs. (Rupees.....) only valid upto..... (date)* as Earnest Money Deposit from (Name and address of contractor) (hereinafter called " the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.

OR **

Whereas the **Executive Engineer(E)- Jalandhar, CPWD Jalandhar** on behalf of the President of India (hereinafter called " The Government") has entered into an agreement bearing number With (name and address of the contractor) (name of work)Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

The Government has further agreed to accept an irrevocable Bank Guarantee for Rs. (Rupees..... only) valid up to (date) as Performance Guarantee/Security Deposit/Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.

We, (indicate the name of the bank) (hereinafter referred to as "the bank"), hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees Only) on demand by the Government within 10 days of the demand.

We, (indicate the name of the Bank), do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. 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)

We, (indicate the name of the Bank), further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this E-Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

We, (indicate the name of the Bank), further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor 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 or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor 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.

We,(indicate the name of the Bank)further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.

This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

We, (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.

This E-Bank Guarantee shall be valid up to Unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees..... only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

DATE

WITNESSES:

1. Signature

Name and Address

Authorized Signatory

Name

Designation

Staff code no.

Bank Seal

2. Signature

Name and Address

*Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

** In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

COMMERCIAL TERMS AND CONDITIONS

Name Of Work:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

1. GENERAL

This specification covers manufacture, (testing ,as needed, before dispatch), delivery at site, all preparatory works, assembly and installation, commissioning put to operation of grid Interactive Solar PV plant/ System consisting of all accessories, cabling works, earthing, final testing etc.

Location: The proposed work of supply, installation ,testing and commissioning of grid connected roof top solar photovoltaic (PV) System **at Plant Quarantine Station.**

The work shall be executed as per CPWD General Specifications for Electrical Works Part – I Internal- 2023, Part-II External 2023, Delhi Schedule of Rates & Delhi Analysis of Rates (E&M) (Item for Solar Photovoltaic Power Plant) all amended up to date, relevant I.E. Rules, BIS/IEC, guidelines of the Punjab State Electrical Inspectorate, the prerequisites of M/s PSEB Ltd.,/distribution licensee of the site and as per directions of Engineer-in- charge.

These additional specifications/ conditions are to be read in conjunction with above and in case of variations, the specifications given in the in the contract shall apply. However, nothing extra shall be paid on account of these additional specifications and conditions, as the same are to be read alongwith schedule of quantities for the work. In case of discrepancy between the Schedule of quantities, List of Makes, Technical Specifications, Drawings etc., the order of preference as per clause 26 of the special conditions shall be observed.

The tenderer should, in its own interest, visit the site and get familiarized with the site conditions before tendering.

No T & P shall be issued by the Department and nothing extra shall be paid on account of this.

Type of Contract: The work to be awarded by this tender shall be treated as indivisible works contract.

2. TERMS OF PAYMENT

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

S.No	Stage	Amount in percent
1	On supply of material at site along with test certificates, guarantee of manufacturer against defect, performance and availability of spare parts for required number of years as per tender document, insurance till handover to the document, insurance till handover to the Department (on pro-rata basis)	70% of quoted rate
2	On installation at site	15% of quoted rate
3	On successful synchronization with grid	5% of quoted rate
4	On successful testing and commissioning	10% of quoted rate

3. Works to be carried out by department

Unless otherwise mentioned in the tender specifications, the following works shall be carried out by the department.

- (a) Space for accommodating all the equipments and components involved in the work and will be in scope of the contractor. The room, store if provided by client may be used for storage of sundry materials and erection equipments or else the agency has to make its own arrangements. However, watch and ward shall be responsibility of the contractor till completion & final handing over to department.

4. Works to be done by the contractor

In addition to supply, installation, testing and commissioning of all the equipments, as per schedule of work, and specifications, the following works shall be deemed to be included within the scope of work to be executed by the contractor. Nothing will be paid extra on this account.

- i) Tools and tackles required for handling and installation of equipments.
- ii) Protection required for the equipments from rain, dust storm etc. during the course of transportation i.e. polythene covering and tarpaulin till completion & handing over to the department.
- iii) Necessary equipments for commissioning/site testing.
- iv) Supplying & Laying of suitable size copper conductor armoured control and power cable from SPV modules, main power cable to PCU units etc. including supply and fixing of PVC channel, steel conduits etc.
- v) Making arrangement of electricity and water required for installation.
- vi) Providing cement concrete foundation as per manufacturer standard and as per the drawing approved by the department.
- vii) Minor building work i/c repairing/ closing of all holes /wall chases etc. for cable entry etc. complete as required.
- viii) **Contractor before quoting the rates should enquire State Electricity Board i.e. PSPCL for Net Metering charges and formalities. Hence, charges for all activities for Net Metering including supply and installation of Net Metering Meter, PSPCL charges etc. to get the work complete will be in the scope of contractor. Nothing extra shall be payable on this account.**

5. RATES

No foreign exchange shall be made available by the Department for importing (purchase) of equipments, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.

The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including works contract tax), GST, octroi, entry tax, duties and levies and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site including temporary constructional storage, risks, over head charges, general liabilities/obligations and clearance from local authorities. The fee for the inspection of installation by government authorities shall be reimbursed by the department on production of receipts. The contractor has to, however, initially make the payment.

6. COMPLETENESS OF TENDER

All sundry equipments, fittings, unit assemblies, accessories, hardware items, foundation, foundation bolts, painting, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

7. STORAGE AND CUSTODY OF MATERIALS

The room, if provided by the client may be used for storage of sundry materials and erection equipments or else the agency has to make its own arrangements. No separate storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department.

8. CARE OF THE BUILDING

Care shall be taken by the contractor while handling and installing the various equipments and components of the work to avoid damage to the building. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

9. COMPLETION PERIOD

The completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials & equipments, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

10. DEFECT LIABILITY PERIOD

All equipments shall have a defect liability period of 12 months, from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor. The solar PV module shall be offered a warranty of minimum 10 years. Power Conditioning unit/Inverter shall be offered a warranty of minimum 5 years. The solar PV module shall have a power output/linear output warranty (performance warranty) for 25 years. **Certificate in this regard shall be submitted from the OEM prior to delivery of the unit by the agency.(Annexure-1 Pg. No.47)**

The tenderer shall guarantee among other things, the following:

- (a) Quality, strength and performance of the materials used as per manufacturers standards.
- (b) Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- (c) Satisfactory operation during the maintenance period.

11. POWER SUPPLY/ WATER SUPPLY

Power and water supply shall be arranged by the contractor at the site for installation purpose. Contractor will take due care to ensure safety of electrical installation during execution of work.

12. ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS

The acceptable makes of various equipments/components/accessories have been indicated in the List of Acceptable Makes of equipments/ materials". The tenderer shall work out the cost of the offer on this basis. Alternate makes are not acceptable.

13. DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER after award of work

The tenderer shall furnish detailed technical literature, pamphlets and performance data for appraisal. The successful tenderer would be required to submit the following drawings for approval of the department.

- (a) General arrangement drawing of the equipments
- (b) Single line diagram.
- (c) Schematic drawing including all safety interlocking.
- (d) Details of foundations for the equipments and the weights of assembled equipments.
- (e) Equipment details proposed to be procured for the execution of the work for the approval of the Engineer-in-charge.
- (f) Any other drawings necessary for the job including
 - i) Detailed technical specification of all the equipments.
 - ii) Design criteria.
 - iii) Design calculations.
 - iv) General arrangement and assembly drawings.
 - v) Contour plan for the area.
 - vi) Solar radiation data.
 - vii) Schematic diagram for entire electric system.
 - viii) G.A. drawings for all types of structures.
 - ix) Quality assurance plans.
 - x) Test report (for type, acceptance and routine tests).
 - xi) Operation & Maintenance instruction's manuals and its drawings.

The successful tenderer should furnish well in advance three copies of detailed instructions and manuals of manufacturer's for all items of equipments regarding installation, adjustments, operation and maintenance including preventive maintenance & trouble shooting together with all the catalogue etc. all in triplicate.

14. EXTENT OF WORK

The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been specifically mentioned in bill of quantity in the tender document. However, major equipment not covered in the scope of the work and required subsequently as an additional feature, not covered in the contract specifications, shall be paid extra. The decision of the engineer-in-charge in the matter shall be final and binding upon the contractor.

15. INSPECTION AND TESTING

Copies of all manufacturer's routine and type test, certificates of the equipments shall be furnished to the inspecting officer at the time of inspection at the factory.

16. COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by this specification. In particular, the equipment and installation will comply with the following:

- (i) Factories Act.
- (ii) Indian Electricity Rules.
- (iii) B.I.S. & other standards as applicable.
- (iv) Workmen's compensation Act.
- (v) Statutory norms prescribed by local bodies like CEA, CPCB as amended upto date and the norms followed by Punjab State Electrical Inspectorate and M/s. PSEB Ltd./power supply Co. etc.

Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. **Failure to provide such safety requirement would make the tenderer liable for penalty as decided by the Engineer-in-charge.** In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

17. INDEMNITY

The successful tenderer shall at all times indemnify the department, consequent on this workscontract. The successful tenderer shall be liable, in accordance with the Indian law and regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there from during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer in so far as the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra tenderer on account of the above.

18. ERECTION TOOLS

No tools and tackles either for unloading or for shifting the equipments for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

19. CO-OPERATION WITH OTHER AGENCIES

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of this work/contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the tenderer himself.

The work will be carried out with least disturbance during shifting & shut down taken in consultation with the client department.

20. MOBILIZATION ADVANCE

No mobilization advance shall be paid to the contractor.

21. INSURANCE AND STORAGE

All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over, duly installed, tested and commissioned.

22. VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION

The contractor shall have to produce all the relevant records to certify that the genuine equipments from the manufacturers has been supplied and erected.

23. PAINTING

This shall include cost of painting of the entire installation. The major equipments shall be factory final finish painted. The agency shall be required to do only touching to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. However hangers, supports etc. of bus trunking shall be painted with required shade including painting with two coats of anticorrosive primer paint at site.

24. TRAINING

The scope of works includes the on job technical training of two persons of department at site. Nothing extra shall be payable on this account.

25. INTERPRETING SPECIFICATIONS

In the case of discrepancy between the schedule of quantities, the specification and/or the drawings, the following order of preference shall be observed:-

- a) Description of schedule of quantities.
- b) Particular specifications, if any.
- c) Additional specifications, if any
- d) Additional/special conditions, if any.
- e) General conditions, if any.
- f) Drawings.
- g) Contract Clauses of General conditions of contract for CPWD 2014.
- h) CPWD specifications for Electrical Works.
- i) Indian standard specifications of relevant BIS or other international code in case BIS code is not available.
- j) Sound engineering practice as per directions of the Engineer-in-charge.
- k) Manufacturers' specifications.

26. Quality Assurance

The technical data sheet and manufacturing drawing of all equipments and materials as per contract specifications shall be prepared by the respective manufacturer's and will be submitted by contractor duly signed before placing the order or manufacturing the material. The Engineer-in-charge shall approve as per contract conditions.

All the materials to be used in the work shall be new and of good quality and shall be got approved from the Engineer-in-Charge before use at site. The equipment shall be not older more than 6 months from the date of receipt at site or year of manufacturing should be current. The equipment shall be procured directly from the manufacturer or authorized dealer and delivery challan/invoice/ proof of dispatch of material of the Agency from where the material is

purchased in support of genuineness of material shall be submitted along with bill for verification.

Manufacturer test certificates of all the equipment and material shall be submitted along with supply.

27. Care of buildings:

Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.

28. Structural Alterations to Buildings:

- a) No structural member in the building shall be damaged/ altered, without prior approval from the competent authority through the Engineer-in-charge.
- b) Structural provisions like openings, cutouts, if any, provided by the department for the work, shall be used. If any modifications or fresh provisions are required, such contingent works shall be carried out by the contractor at his cost after approval of the engineer-in-charge.
- c) All such openings in floors provided by the department shall be closed by the contractor after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineer-in-charge without any extra payment.
- d) All chases required in connection with the electrical works shall be provided and filled by the contractor at his own cost to the original architectural finish of the buildings.

29. Addition to an installation:

Any addition, temporary or permanent, to the existing electrical installation shall not be made without a properly worked out scheme/design by a qualified Electrical Engineer to ensure that such addition does not lead to overloading, safety violation of the existing system.

30. Drawings:

The work shall be carried out in accordance with the drawings and the tender documents and also in accordance with modification thereto from time to time as approved by the Engineer-in-charge. All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term as used in Clause 11 of the conditions of contract (PWD 7 or PWD 8). They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub mains and the position of all points with their controls. c) All circuits shall be indicated and numbered in the wiring diagram and the points shall be given the same number as the circuit to which they are electrically connected. d) After award of the work, the firm will be required to submit the drawings for the proposed work including layout plan, conduit routes etc. Work will be carried out as per the approved drawings.

31. The contractor shall take all safety precautions to avoid accidents by exhibiting caution boards, red flags, red lights and by providing necessary barriers and all other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.

32. ON SITE TRAINING

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labour and helpers for operating the entire installation for a period of thirty (30) working days of ten (10) hours each, to enable the engineer-in-charge and his duly authorized representatives to get acquainted with the operation of the system. During this period, the contractor shall train the engineer-in-charge's personnel in the operation, adjustment and maintenance of all equipment installed.

Additional Terms and Conditions

Name of Work:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar

1 GENERAL SCHEME & SCOPE

This document contains the requirement of on -grid/grid interactive Solar Photo Voltaic (SPV) power supply System for general electrical load. Suitable size of solar photovoltaic system is to be installed at each location and has to feed all the electrical installations in the campus and shall be importing power to the grid also. The Power Conditioning Unit (PCU) shall be Grid tied, i.e. with a priority for use of Solar power for general electrical load and if the solar power becomes inadequate due to solar radiation outage or the fault in solar generation system then, Main/grid supply shall be used for meeting the power demand due to general electrical load.

The scope of work include designing and providing suitable size of Grid interactive solar power system, PCU (power conditioning unit), all measuring devices, indication devices, protection Devices, switching devices with all necessary wiring, cabling, terminations, mounting structure on MS structure of the covered pathway and any other item needed for proper functioning and protection of system from external/internal causes & from all kind of surges etc. System shall be designed with sound engineering and state of the art manner.

2 DEFINITION

In an on grid solar photovoltaic system, an array of solar panels are connected with solar inverter which is connected to the grid through meter. The solar panels converts sunlight into DC electricity which is then converted into alternating current termed as AC power. A Grid Connected Solar Rooftop Photo Voltaic (SPV) system consists of Solar PV modules combined into arrays, Mounting Structure, Inverter/Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Controls & Protections, interconnection cables and switches. PV Array(s) to be mounted on a suitable structure. Grid connected SPV power plant is without battery and should be designed with necessary features to supplement the grid power and interact with mains power during day time. Components and parts used in the Solar power plants including the PV modules, metal structures, cables, junction box(s), switches, inverters/PCUs etc. should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

3 GRID TIED SPV POWER SUPPLY SYSTEM:

Grid tied solar inverters are suited for outdoor/indoor use and the ideal solution for medium voltage application. The inverters provide a wide maximum point power tracking (MPPT) voltage range on effective efficiency more than as per schedule of quantities.

4 SITE LAYOUT DESIGN:

The contractor will submit his layout design for SPV module including its structure details to Engineer incharge for approval before start of work. The contractor should visit the site before quoting the tender to have idea of the site related preparation to be included in their offer.

5 SPV MODULE/ARRAY:

Solar Photo Voltaic Generating Sources: SPV generating sources constituted of following building blocks:

SPV Module: SPV Module is the basic building block of the SPV power supply, which consists of a number of Solar cells (Semiconductor Devices which when exposed to sunlight produces DC electricity) connected in series and hermetically sealed with a toughened and highly

transparent front glass cover. These modules are connected in series as well as in parallel to get the desired power and voltage. The Rated DC current of One solar PV module shall be 330Wp or higher. Solar PV modules shall be PID (Potential induced degradation) free.

SPV Panel: SPV Modules of same rating are connected in series to form a SPV panel to get the desired voltage.

SPV Array: A number of panels are connected in parallel to get the desired power. This whole combination is called an array. The SPV array is designed in such a way that, it provides simultaneous power to meet the load demand, when sufficient solar irradiation is available.

Design Features: The mechanical design and construction of SPV modules, panels and mounting structure shall be inherently robust and rigid under all conditions of operation, adjustment, storage and transport. Sharp edges shall be avoided.

Array capacity of each power plant shall not be less than 3 kWp @ standard test conditions depending on size of the power plant. Number of modules required shall be worked out accordingly. Standard test conditions shall be solar irradiance of 1000w/m², cell operating temp. Of 25 Deg C and spectral AM of 1.5.

Single module with the highest wattage is preferred. Solar PV module array will be made by utilizing Poly/mono Crystalline high efficiency Silicon Solar PV cells. Minimum power output guarantee offered for the SPV Module shall not be less than for a period of 25 years as per the tender conditions. Individual solar PV module rating shall not be less than 380 Wp at standard test conditions. Each Solar PV module offered shall meet following minimum requirements.

SOLAR PHOTOVOLTAIC MODULES- General features:

The module conversion efficiency of the PV modules should be minimum 19% under standard test conditions.

The solar PV modules shall be MNRE approved. If PV module is not MNRE approved, a certificate of MNRE approved laboratory shall be obtained and submitted by the agency.

Test Certificate issued by one of the MNRE/ MNRE authorized test centre(s).

Modules of any type and of mono/poly crystalline film can be used.

The module type must be qualified as per IEC 61215 latest edition. Modules must qualify to IEC 61730 Part I and II for construction and safety qualification testing. Certificate of MNRE approval to be submitted prior to delivery. I-V curve of each PV module with serial number of each module should be submitted along with supply of modules. Solar PV modules shall conform to IEC-61215 standards. Documentary evidence of IEC- 61215 certification shall be submitted after award of work but prior to supply of material.

The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 330 Wp and above wattage per module. Solar PV modules having Power generation capacities less than minimum 330 Watts shall not be accepted. Test reports of the modules should be submitted.

Protective devices against surges at the PV module shall be provided as per Punjab State Electrical Inspectorate norms. Low voltage drop bypass diodes shall also be provided.

DC surge arrester shall be provided at DC side and it shall be of type II(as per IEC 61643-I, IEC 62548/ 2016) rated at continuous operating voltage of at least 125% of open circuit voltage of PV string and a flash current of more than 5Amps.

PV string connected in parallel shall have matched open circuit voltage within 5% per string to avoid circulation current as per IEC: 62548:2016.

Sizing of cables for PVC sub array shall be chosen as per IEC: 62548: 2016 and its amendments.

The module frame shall be made of corrosion resistant materials having anodized aluminium or as per manufacturer standard.

Crystalline high power cells shall be used in the Solar Photovoltaic module. Each Solar module shall consist of 72 Photovoltaic cells redundantly interconnected.

Junction box with cable gland & terminal connection block accepting 2.5mm² to 6mm² cable would be preferred.

The rated output power of any supplied module shall not vary more than 3-5% from the average power rating.

The fill factor of modules shall not be less than 0.70 (typical).

The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power.

Other general requirement for the PV modules and subsystems shall be of the following:

- a) The rated output power of any supplied module shall have a tolerance of $\pm 3\%$.
- b) The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic mean for all modules and/or for all module strings, as the case may be.
- c) The module shall be provided with a junction box with weather proof lid of sealed type and IP-65 rated.

Warranty: The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and not less than 80% at the end of 25 years. Solar PV module shall be product warranted for 10 years by the OEM/authorised channel partner/agent. Also, solar PV Module shall be offered a power output/linear output warranty for 25 years by the OEM as above. The certificate in this regard shall be furnished by the agency from OEM prior to delivery of unit.

SPV MODULES- Other features

- (a) Each SPV Module to be supplied should have minimum declared output of 330Wp or higher. Number of Modules to be provided shall be worked out accordingly. Test reports of the modules should be submitted.
- (b) Stabilized output of the Solar PV Array for the Power Plant should not be less than Calculated Kwp under standard Test Conditions of solar irradiance of 1000W/m² at 25 Deg. Celsius, spectrum Air mass: 1.5 at cell temperature of 25 Deg.C
- (c) Modules for Power Plant shall be made of poly or mono-crystalline Silicon Solar cells.
- (d) Except otherwise specified, the front module surface shall consist of impact resistant, low iron and high transmission glass.
- (e) The module frame shall be made of aluminum or corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules.

SOLAR PV MODULE (ELECTRICAL FEATURES)

- (a) Crystalline high power cells shall be used in the Solar Photovoltaic module. Solar Module shall be laminated using laminating technology using established polymer (EVA) and Tedlar/ Polyester laminate. The solar modules shall have suitable encapsulation and sealing arrangement to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with thermal expansion properties of the Silicon cells of the module framing arrangement/ material. The encapsulation arrangement shall ensure complete moisture proofing during life of solar modules.
- (b) SPV Module conversion efficiency should be greater than 19%. Module shall be made of high transmissivity glass front surface giving high encapsulation gain.

- (c) All materials used shall be having a proven history of reliable and stable operation in external outdoor/indoor applications.
- (d) Module rating is considered under standard test conditions, however Solar modules shall be designed to operate and perform in relative humidity up to 95% (non-condensing) with temperature between -10 Deg C and +85 Deg C and with stand gusts up to 150Km/hr from back side of the panel or the Geological data of Punjab can be followed for the design to meet optimum generation whichever is higher.
- (e) Sample modules and production processes employed in the manufacture of the offered module shall be in accordance with the requirement of IEC 61730 with appropriate certificate.
- (f) Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.
 - (1) Name of the manufacturer of PV module.
 - (2) Name of the manufacturer of Solar cells.
 - (3) Month and year of the manufacturer (Separately for Solar cell and module)
 - (4) Country of origin (Separately for Solar cell and module)
 - (5) I-V curve for the module
 - (6) Wattage, I_m , V_m and fill factor for the module.
 - (7) Unique Serial No and Model Number of the module.
 - (8) Date and year of obtaining IEC PV module qualification certificate.
 - (9) Name of the test lab issuing IEC certificate.
 - (10) MNRE certificate details

SOLAR PV MODULE (MECHANICAL FEATURES)

Solar PV module design shall conform to following Mechanical requirement:-

- (1) Toughened, low iron content.
- (2) High transitivity front glass.
- (3) Anodized Aluminum Frame.
- (4) Ethyl vinyl Acetate (EVA) encapsulant.
- (5) Silicon edge sealant around laminate.
- (6) Tedlar/ Polyester tri-laminate back surface.
- (7) Weatherproof DC rated MC connections easier and secure, not allowing for any loose Connections, Resistant to water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.

6 . JUNCTION BOXES (JBs):

- a) The junction boxes are to be provided in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The Junction Boxes shall be such that input & output termination can be made through suitable cable glands.
- b) Copper bus bars/terminal blocks should be housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208. Hinged door should be used with EPDM rubber gasket to prevent water entry.
- c) Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs) / surge arrestors and suitable Reverse Blocking Diodes etc. The Junction Boxes shall have suitable arrangement for monitoring and disconnection for each of the groups.
- d) A test point for each sub-group for quick fault location shall be provided. It shall have facility for group isolation.
- e) The rating of the JB's shall be suitable with adequate safety factor to inter connect the Solar PV array

7 . PV ARRAY CONFIGURATION

- a) The Solar array shall be configured in multiple number of sub- arrays, providing optimum DC power. The bidder shall submit their own design indicating configuration of PCU and respective sub arrays.
- b) The PV modules should be mounted on aluminum structures/GI/ MS powder coated of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour or as per the the geological wind map for Punjab whichever is stringent. **STADD analysis in substantiation of meeting this condition to be submitted for verification by department.**
- c) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels.
- d) The bidder needs to take care of the load bearing capacity of the roof and to arrange suitable structures based on the quality of roof. The total load of the structure (when installed with PV modules) on the terrace/roof should be less than 60 kg/m². Suitable civil work for installation of the structure as per schedule of quantities is to be done by the supplier. Civil Structure should be neat & clean, with proper alignment and round in shape with emphasis on proper grouting and there should not be leakage, seepage in roof after installation of plant.

8 . MODULE MOUNTING STRUCTURE

The mounting structure would be designed to sustain wind loading of up to 180Kmph or as per the geological wind map of Punjab whichever is stringent and shall be protected by using Eco friendly anti corrosion on structure. The entire structure including array will be earthed to an independent pit with redundant paths. Mounting Structures with fixed/adjustable tilt has been proposed. The Hardware shall be made of SS material or as per manufacturer standard.

- a) The structure design shall be appropriate and innovative and must follow the existing structure and profile.

- b) Design, drawing with material selected shall be submitted for prior approval of Engineer in- charge. **The design shall consider the structural design and safety of the proposed steel structure being provided for base structure.**
- c) The structure shall be designed to allow easy replacement of any PV module.
- d) The structure shall be designed for simple mechanical and electrical installation. It shall support SPV module at a given orientation, absorb and transfer the mechanical loads to the roofproperly.
- e) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- f) Nut & bolts supporting structure including module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area; Nut, bolts should be especially in SS material.
- g) The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings.
- h) The drawings along with detailed design shall be submitted in three sets to the engineer-in- charge for approval before starting the execution of work. The work will be carried out as per designs approved by the Engineer in-charge.
- i) Height of solar mounting structure shall be as per site feasibility.

Any modification required on the existing structure as part of installation of solar PV panels with required GI channels shall be deemed to be included.

9 . POWER CONDITIONING UNIT (PCU)

Power Conditioning Unit (PCU) is critical equipment in Grid interactive SPV Power Plant. This equipment converts DC power generated by SPV array, into three phase medium voltage AC to be connected to Grid. It also provides necessary protections for Grid Synchronization and Data Logging/Monitoring. The DC energy, thus produced has to be utilized to maximum and supplied to the DC bus for inverting to AC voltage with the help of Power Conditioning Unit using its MPPT (The efficiency of MPPT shall be of high efficiency & shall be designed to meet the Solar PV Array capacity control) to extract maximum energy from solar array and provides 415V AC, 3- ph 50Hz to synchronize with local grid. Power conditioning unit shall be MNRE approved.

- a) The PCU shall have protection features such as, over current, short circuit, over temperature etc.
- b) The PCU shall be of very high quality having high efficiency and shall be capable of running in isolated mode.
- c) The PCU should be designed to be completely compatible with the SPV array voltage and gridsupply voltage.
- d) The PCU should be designed for continuous, reliable power supply as per specifications.
- e) The PCU shall have internal protection arrangement against any sustained fault.
- f) The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the detailedtechnical specification submitted by contractor **prior to delivery of the unit.**
- g) It should have user friendly LCD/LED display for programming and view on line parameters such as DC power input, DC input voltage, DC current, AC power output, AC voltage and AC current and Power factor etc.
- h) The PCU shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.
- i) The Grid connect PCU shall be sourced from list of acceptable makes, which will incorporate latest technological advances to provide highly reliable and efficient energy conversion from DC to AC. The PCU incorporates a new system design which uses multiple power stacks which work in tandem. The PCU should be Single/ three phase

static solid state type power conditioning units/string inverters suitability connected & synchronized to give three phase supply output. Both AC & DC lines shall have suitable fuses/MCBs and contactors to allow safe start up and shut down of the system. Fuses/MCBs used in the DC circuit should be DC rated. The PCU shall have provision for input and output isolation. Each solid-state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.

- j) PCU / Inverter should be tested from the test centers MNRE / BIS / IEC accredited testing calibration laboratories and shall be MNRE approved.

10 . WIRING

1. All instruments and Panel wiring shall be of heat resisting and self extinguishing type in compliance with IS. Plastic or porcelain cleats of the limited compression type shall be used for holding wiring runs. All wires shall be suitable for bending to meet the terminal studs at right angles. Metal cases of all apparatus mounted on panels shall be separately earthed.
2. The following colour scheme of the wiring shall be used as per IS: 375.
 - a) AC three phase circuits:
No.1 Phase: Red. No.2 Phase: Yellow. No.3
Phase: Blue Neutral Conductor: Black

Connection to Earth: Green

D.C. circuits: Grey

The cabling for solar PV system shall be UV protected.

11 CABLE ACCESSORIES

Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted. Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles. The panels' bottoms should be properly sealed to ensure the required ingress protection of IP 42.

The terminal end of cables and wires are to be fitted with good quality numbered ferrules of proper sizes so that the cables can be identified easily.

12 . INTEGRATION OF PV POWER WITH GRID:

- In this case, Power plant is without battery bank (i.e. with string inverter), the existing uni- directional meter of the user shall be installed for gross metering of solar generation while a Bi- directional meter shall be installed for net-metering purpose or conditions pertaining to Net Metering Policy of M/s PSEB Ltd. or M/s PSPCL State electricity authority.
- Punjab State Electrical Inspectorate guidelines/norms for interconnecting solar power with Grid and for the grid tied solar PV plant/system shall be complied in full Certification of anti-Islanding protection in the inverter/PCU from the manufacturer of the equipment shall be mandatory.
- Certification of anti-Islanding protection in the inverter/PCU from the manufacturer of the equipment shall be mandatory.

13 . DATA MONITORING OF POWER PLANT:

- i) PCU to log the inverter performance data and transmits the same to the Data logger.
- ii) Data logger shall then gather information and monitor the performance of the inverter.

It shall also support measurements from the external sensors. The data can be acquired remotely via modem.

14 . LIGHTNING & OVER VOLTAGE PROTECTION

The SPV Power plant should be provided with Lightning and surge voltage protection connected to proper earth electrodes.

The Lightning Conductors shall be made as per applicable Indian Standards and as per Punjab State Electrical Inspectorate norms in order to protect the entire Array Yard/Shed from lightning strike.

The lightning conductor shall be earthed through flats and connected to the Earth electrodes as per applicable Indian Standards with earth pits. Each Lightning Conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron/MS cover plate having locking arrangement, watering pipe, charcoal or coke and salt as per required provisions of IS.

The bidder shall ensure adequate lightning protection to provide acceptable degree of protection as per IS for the array Yard/Shed. If necessary, more numbers of Lightning conductors may be provided.

For each earth pit, necessary test Point shall have to be provided.

15 . EARTHING SYSTEM

- a) Each array structure of the SPV shall be grounded properly. The array structure are to be connected to earth pits as per CPWD General Specifications and as per requirements of Punjab State Electrical Inspectorate norms whichever is stringent. Junction boxes shall be connected to the main earthing conductor/ electrode.
- b) Earthing system installation shall be in strict accordance with CPWD General Specifications Part-I internal 2023 amended up to date and as per Punjab State Electrical Inspectorate norms. The size of earthing conductor to solar PV array shall be 1.56 times the maximum short circuit current of the PV array.
- c) Necessary test point provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- d) In compliance to Rule 33 and 61 of Indian Electricity Rules, 1956 (as amended up to date) all non- current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.
- e) Earth resistance of the earth pits shall be tested in presence of the representative of Engineer-in- charge.

16 . AC Distribution Box (ACDB)

- i) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/IS-60947 part I, II and III.
- ii) The switches, cabling work, Manual isolation of Inverters/Grid should be undertaken by the bidder as part of the project within quoted rates.

17 . PRIORITY FOR POWER CONSUMPTION:

Regarding the generated power consumption, in case of string inverter, priority need to be given for internal consumption first and thereafter any excess power can be exported to grid.

18 . Grid Islanding:

- i) In the event of a power failure on the electric grid, it is required that any independent power-

producing inverters attached to the grid turn off in a short period of time. This prevents the DC- to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition, to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.

- ii) A manual disconnect pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked, if required, by the utility personnel.

19 PAINTING & FINISH

- i All metal surfaces shall be thoroughly cleaned of rust, scale, oil, grease, dirt etc. Fabricated structures shall be pickled and then rinsed to remove any trace of acid. The under surface shall be made free from all imperfections before undertaking the finishing coat.
- ii. After Phosphate treatment, two (2) coats of yellow zinc chromate primer shall be applied followed by two(2) coats of epoxy based synthetic enamelled paint. Thickness of paint shall be not less than 75 micron.
- iii. All unpainted steel parts shall be cadmium plated or suitably treated to prevent rust formation. If these parts are moving elements then they shall be greased

Note: To be furnished on a 'Non-Judicial' stamp paper worth Rs. 200/-

UNDERTAKING FROM MANUFACTURER/AUTHORIZED CHANNEL PARTNER FOR GRID
INTERACTIVE SOLAR POWER PLANT/ SOLAR PV PANEL/SOLAR PV INVERTER(PCU)
(To be submitted along with supply of system)

We hereby agree that

1. Solar PV panels supplied by us are offered a warranty of 10 (ten) years from the date of handing over.*
2. We assure a performance warranty of solar PV panels for a period of 25 (twenty five) years; Peak output capacity will not be less than 90% of the claimed peak output capacity at the end of 10 (ten) years and peak output capacity will not be less than 80% of the claimed peak output capacity at the end of 25 (Twenty five) years. *
3. PCU/ Solar PV inverter supplied by us are offered a warranty for 5 (five) years from the date of handing over. *
4. In case of any defect, discontinuation of model and non-availability of spares, we will replace the unit with equivalent/ high end model during the above period of product warranty.

* If the solar PV module and PCU/inverter are from separate OEMs, separate affidavits may be submitted.

For M/S

.....

.....(Authorized signatory of
manufacturer

/ dealer of Solar PV plant and /or Solar PV inverter)

Counter signed

Signature of Major contractor

GUARANTEE BOND FOR VARIOUS ITEMS

The contractor shall be duly responsible for and shall guarantee for proper design and performance of the following items for the specified period of years from the date of completion of the work :

SI No.	Description of Item	Gross Value of Work done (Rs)	Remarks (Guarantee Period)
1.	Solar Photo Voltaic System	As per final bill amount against these items in SOQ	3% (Three) percentage of the Gross Value of work done against these items shall be retained as Security Deposit for 01(One)Year*

Note:

The amount so withheld would be released after **the 1 year * so specified to be reckoned** after the date of completion of the entire work under the Agreement if the performance of the work done is found satisfactory. If any defects are noticed during the Guarantee period, it shall be rectified by the contractor within seven days of receipt of intimation of defects in the work. If the defects as pointed out are not attended by the contractor within the specified period, the same will be got rectified from another Contractor at the risk and cost of the Contractor.

However, the Security deposit deducted may be released as per Schedule-F by Engineer-in-charge. The Security deposit against these items of works shall be in addition to the Security deposit mentioned else where in the Contract form.

ISSUED BY THE AUTHORITY OF DIRECTOR GENERAL, CPWD

Nirman Bhawan, New Delhi

Dated: 10.02.2025

Sub: Modifications in para 5.18 of CPWD Works Manual 2024- regarding Payment of bills.

Following modifications is made in para 5.18 for CPWD Works Manual 2024:

Existing Provision	Modified Provision
5.18 Payment	5.18 Payment
5.18.1 Time Schedule for Payment of Bills	5.18.1 Time Schedule for Payment of Bills
Ad-hoc payment the bill.	No change
The bill shall be concerned Executive Engineer.	No change
The remaining payment working days.	No change
The final bill shall be paid within the time schedule as per GCC provisions.	The final bill shall be paid only after compliance of pre-requisite documents such as sanctioned copies of extra items and deviation in quantities, escalation statements, recovery statement, theoretical statement, final completion certificate, sanctioned final extension of time case, mandatory tests statement, dismantled materials account and other documents as mentioned in clause 7A etc. as per GCC provisions.

This is issued with the approval of DG CPWD.

(दिनेश कुमार उज्जैनिया)
अधीक्षण अभियंता (सी.एंड एम.)

Issued from file No. CSQ/CM/16(1)/2024
e-file 9190123 (DFA/9315619)

केलोनवि तथा लोनवि दिल्ली के सभी अधिकारियों को आवश्यक सूचना एवं कार्यवाही हेतु।
(केलोनवि वेबसाइट के माध्यम से)

LIST OF ACCEPTABLE MAKES

Sl. No	Description of Material/ Equipment	Make
1.	SPV Modules	Vikram Solar Pvt Ltd. /TATA Power solar / Adani Solar/ Moserbaer/ Waree Engineers Ltd/ Manufacturers Approved by Ministry of New & Renewable Energy
2.	Data logging system	As per OEM of PCU
3.	Power Control Unit (PCU) string PCU	MNRE approved models of Delta / ABB / Mitshubishi / Schneider / Ingeteam/ Frontius/ Havells/ Polycab/ Luminious/ Hitachi/ Waaree Engineers
4	XLPE insulated aluminium / copper conductor armoured /unarmoured power cable of 1.1 KV grade	Polycab/ Grandlay/ RR Kabel/ KEI/ Havells / Lapp/ Rallison
5	DWC- HDPE pipe	Rex /Duraline/Jain Irrigation/Prince
6.	Material for Array Structure	Tata/ Jindal/Sail
7.	Sandwich PUF paneled roofing sheets	Lloyd Insulation/Jindal Mectec / Danpalon /GE Plastic/Lexan
8.	Poly carbonate junction boxes	Hensel / Clipsal / Sintex
9.	Cable gland double compression with earthing links	Comet / Cosmos/Jainson / Dowells
10.	PVC insulated copper conductor stranded flexible FRLS wire (pre twisted)	Polycab / KEI / Havells / RR Kabel / Grandlay/ Rallison/Lapp
11.	Any other item	As per approval of the Engineer-in-charge

NOTES :-

- 1.) In respect of materials for which approved makes are not specified above, then proposed makes shall be decided by the Engineer-in-Charge and as per sample approved before procurement & Installation.
- 2.) The material shall be procured only from the manufacturers & their authorized dealers & documentary proof for such procurement & supply shall be produced by the contractor. Contractor has to produce original bill/ challan to the Eng-in-charge.

Assistant Engineer (E) P
CPWD, Jalandhar(Pb)

Executive Engineer(E)-Jalandhar
CPWD, Jalandhar(Pb)

Price Bid

Schedule of Work					
Name of Work:- Installation of Rooftop Solar Power Plants at Regional Plant Quarantine Station, Amritsar					
S.No.	Description of Items	Qty.	Unit	Rate	Amount
1	Solar Photovoltaic Power Generation System				
	Supplying Installation, Testing and Commissioning of on-grid Solar Photovoltaic Power Plant conforming to various applicable standards BIS, IEC, MNRE guidelines, the Central Electricity Authority Regulations and CPWD Specifications as amended upto date, consisting of Mono/Poly Crystalline silicon solar cells module, net metering facility, necessary control, protections, earthing, cabling, mounting structure, junction boxes, power conditioning units, Real time online web interfaced Data Monitoring System, Distribution panels, grid connecting arrangement, conduits, pipes, cable trays and other accessories etc. as required.				
(a)	High Energy Efficiency Solar Photovoltaic Module of capacity 330 Wp or above, manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730Part-1, IS/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 23% at STC with temperature coefficient of Pmax better than -0.30% per 0C. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. Solar Modules shall be designed to operate in relative humidity upto 100% with temperature between -10 0C and +85 0C. Further, each PV module used in any solar power project must have Radio frequency identification tag with information such as name of manufacturer, month and year of manufacturing, country of origin (separately for Solar cell and module), I-V curve, Unique Serial No and Model No of the module, Wattage, Im, Vm and FF, name of test lab issuing IEC certificate.				
(b)	Power Conditioning Unit (PCU) of 350-800 V DC Input voltage range and 415 V AC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC with a variation of 10% at nominal voltage. Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 0C, Minimum IP-65 for outdoor and Minimum IP 21 for indoor, Built-in				

	meter and data logger, MPPT, switching devices IGBT/MOSFETs and controller Microprocessor /DSP. PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown. The PCU shall be able to withstand unbalanced load conforming to IEC standard with shutdown/standby mode. It must be provided with grid islanding along with manual disconnect pole isolation switch besides automatic disconnection. Minimum protections: Mains Under / Over Voltage, Over current, Over/Under grid frequency, Over temperature, Surge voltage induced at output due to external source, Short-circuit, Lightening, Anti Islanding (for grid synch. Mode) and other protections as per applicable standards. LCD/LED display of minimum parameters: DC input voltage, DC current, AC Voltage and current (all 3 phases, in case of 3 phase), Instantaneous & cumulative AC output power, Daily DC energy produced and other parameters applicable standard. Communication interface RS 485 / RS 232.				
(c)	Module mounting structure: The roof top solar plant generation units shall be installed by using supporting Aluminium/Galvanized MS structure (mass of zinc coating shall be as per IS4759) having minimum head room clearance of 2.4 meter above the terrace level /ground level. The mounting structure would be designed to sustain wind load and seismic parameter of the site of installation. All the structure shall be design as per applicable BIS code and the material shall also confirm the applicable BIS Code. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. The suitable arrangements for maintenance and cleaning shall be provided.				
(d)	Real time online web interfaced Data Monitoring System complete with accessories for various parameters such as Solar Irradiance, temperature, AC Output Voltage and current, Output Power, Power factor, DC Input Voltage and Current, Time Active, Time disabled, Time Idle, Power produced and other parameters as per standard practices.				

(e)	Array junction box & Main junction box with IP 65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. Each junction box shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement with High quality Suitable capacity Metal Oxide Varistors(MOVs) (semiconductor diode with resistant applied voltage)/ surge arrestors and suitable Reverse Blocking Diodes, isolation switches isolate the DC input to Inverter, copper bus bar etc.				
(f)	Lightning, surge voltage protection, earthing protection and grid islanding.				
(g)	Cables: Connections & Interconnections by required size IR/UV protected XLPE insulated copper conductor 1.1 kV grade armored power and control cables(ISI Marked) along with supplying & fixing of necessary channel/conduit, GI cable trays, supports, lugs, thimble and other accessories etc. as required.				
(h)	DC Distribution Board And AC Distribution Panel Board: IP65, free standing, metal cladded, having copper bus bar, having required protection and control gears, connection-interconnection, etc. as required.	60.00	KWP	54280.00	3256800.00
	Total				3256800.00

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