

## INDEX

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## INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING

The Executive Engineer (E), DED-302 (Formerly known as ED-XVII, CPWD, R K Puram New Delhi. (Phone 011-26177096/ e-mail : [deleed17.cpwd@nic.in](mailto:deleed17.cpwd@nic.in)), invites on behalf of President of India, online percentage rate e-tender, **in two bid system (Eligibility cum technical bid and financial bid)** from specialized agencies / firms for the following work:-

NIT No.	05/EE(E)/DED-302/2021-22/Delhi
Name of work & location	SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj, Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.
Estimated cost put to tender	Rs. 13,65,000/-
Earnest Money	NIL (As per DG OM No. DG/CON/Misc./13, dt. 23.11.2020), However,, EMD declaration as per Performa shall be mandatory)
Period of Completion	03 Months
Last date & time of submission of bids, EMD & other documents as specified in the NIT	Upto 18:10 hrs. on 24.05.2021
Time & date of opening Eligibility cum technical bid	18:20 hrs. on 24.05.2021
Time & date of opening of price bid	To be intimated later on

**\*\*To be filled up by EE(E)**

1. The Intending Contractors who fulfill the following requirements shall be eligible to apply, Joint ventures are not accepted.
  - a) Experience of having successfully completed works during last seven years ending Last day of month previous to the one in which tender are invited.
  - (i) Three similar works each of value not less than Rs. **546000/-** or Two similar works each of value not less than Rs. **819000/-** or One similar work of value not less than Rs. **1092000/-**.  
Similar work shall mean works of **"SITC of grid interactive Solar PV Power Generation 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 Last day of month previous to the one in which tender is invited.
  - (ii) Certificate of average annual financial turnover of at least Rs. 6,82,500 /- (50% of estimated cost i.e. Rs. 13,65,000/- put to tender ) of the last three years i.e. 2018-19, 2019-20 & 2020-21 from CA.
  - (iii) Networth Certificate of minimum of Rs. 2,04,750/- (15% of the estimated cost i.e. Rs. 13,65,000/- put to tender issued by Certified Chartered Accountant) (Solvency not required if applicant is a class I (Composite) registered contractor of CPWD and estimated cost is up to Rs. 25 Crore) (Networth Certificate should be issued during last 1 year only)
  - d) The tenderer shall submit an undertaking from OEM for providing technical support for 25 years of life of solar PV panels and required performance of the Solar PV System (25 Years performance warranty on SPV modules with degradation in performance of maximum 10% upto 10 years and 20% beyond 10 years and upto 25 years as per industrial standard warranty conditions on complete system from the date of commissioning of the system. If SPV modules do not perform satisfactorily as above then the manufacturer of the solar PV modules shall make proper check of the quality of material and should replace the unsatisfactorily solar PV modules with free of cost)

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 [www.tenderwizard.com/cpwd](http://www.tenderwizard.com/cpwd) or [www.cpwd.gov.in](http://www.cpwd.gov.in).
5. Those contractors not registered on the website mentioned above, are required to get registered before and. If needed they can be imparted training on online bidding process as per details available on the website.
6. The intending bidder must have valid class- III digital signature to submit the bid.
7. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
8. Contractor can upload documents in the form of JPG format and PDF format.
9. 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 eligibility bids. There is no need to upload entire voluminous balance sheet.
10. Contractor must ensure to quote percentage rate of works component as given in template. The column meant for quoting percentage 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 tenderer does not quote any percentage above or below on the total amount of the tender or any section / sub head in percentage tender, **the tender shall be treated as invalid and not consider lowest tender.**
12. The eligibility bid shall be opened first on due date and time as mentioned above. The time and date of opening of technical bid of contractors qualifying the eligibility bid shall be communicated to them at a later date.
13. The Pre- bid conference shall be held in the Chamber of **Executive Engineer (E), DED-302 (Formerly known as ED-XVII, CPWD, R K Puram New Delhi.-110066 on 20-05-2021 at 11:00 AM** to clear the doubt of intending bidders, if any.
14. When bids are invited in two-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.
15. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
- 16. List of Documents to be scanned and uploaded within the period of bid submission: -**
  1. Earnest Money deposit declaration proforma duly signed (Page 5)
  2. Attested copies of completion certificate/ Work experience i.e SITC of grid interactive Solar PV Power Generation System.
  3. Completion certificate should be issued by the officers of the client department, will have to be scanned and uploaded. Incomplete certificate shall be summarily rejected. The completion certificate must clearly indicate the following. (Originals shall also be produced for verification if required)
    - a) The date of completion of work.
    - b) Nature and value of the work.
    - c) That the work has been completed satisfactorily.

- d) Actual work done amount of completion certificate of each specialized component separately.
4. Certificate of average annual financial turnover of at least Rs. 6,82,500/- ( 50% of estimated cost i.e. Rs. 13,65,000/- put to tender ) of the last three years i.e. 2018-19 , 2019-20 & 2020-21 from CA.
  5. Networth Certificate of minimum of Rs. 2,04,750/- (15% of the estimated cost i.e. Rs. 13,65,000/- put to tender issued by Certified Chartered Accountant) (Solvency not required if applicant is a class I (Composite) registered contractor of CPWD and estimated cost is up to Rs. 25 Crore) (Networth Certificate should be issued during last 1 year only)
  6. GST Registration Certificate of the State in which the work is to be taken up, if already obtained by the bidder. If the bidder has not obtained GST registration in the State in which the work is to be taken up, or as required by GST authorities then in such a case the bidder shall scan and upload following under taking along with other bid documents.  
"If work is awarded to me, I/we shall obtain GST registration Certificate of the State, in which work is to be taken up, 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 a/c of the work executed and/or for any action taken by CPWD or GST department in this regard.
  7. Undertaking from OEM for providing technical support for 25 years of life of solar PV panels and required performance of the Solar PV System (25 Years performance warranty on SPV modules with degradation in performance of maximum 10% upto 10 years and 20% beyond 10 years and upto 25 years as per industrial standard warranty conditions on complete system from the date of commissioning of the system.
  8. Affidavit as per provisions of clause 1.2.3 of CPWD-6 for e-tendering.
  9. Documents related to eligibility bid and technical bid.
  10. Valid Electrical Contractor License or undertaking that they will either obtain valid electrical license at the time of execution of electrical work or associate the contractor having valid electrical license of appropriate class.
  11. Email & mobile no. of the firm/ agency on the letter head of firm/ agency (For making correspondence)

Assistant Engineer(E)-1  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

Assistant Engineer (E) P  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

Executive Engineer (E)  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

**PROFORMA FOR EARNEST MONEY DEPOSIT DECLARATION**

Whereas, I /we.....have submitted bids for SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.

I/we hereby submit following declaration in lieu of submitting earnest Money deposit.

(1) If after the opening of tender, I/ we withdraw or modify my/our bid during the period of validity of tender(including extended validity of tender) specified in the tender s\documents,

OR

(2) If, after award of work, I/we fail to sign the contract, or to submit performance guarantee before the deadline in the tender documents,

I/we shall be suspended for one year and shall not be eligible to bid for CPWD tenders from date of issue of suspension order.

Signature of contractor

भारत सरकार **GOVERNMENT OF INDIA**  
 केन्द्रीय लोक निर्माण विभाग **CENTRAL PUBLIC WORKS DEPARTMENT**  
 निविदा आमंत्रण सूचना **NOTICE INVITING e-BID**  
 (ई-निविदा के लिए/For e-tendering)

1. ~~Item rate/percentage rate bids are invited on behalf of President of India from the from specialized agencies/firms and those of appropriate list of M.E,S, BSNL, Railways and ..... State P.W.D. (B&R) or State Govt.'s Department ..... (Strike out as the case may be) dealing with building and roads, if there is no state PWD (B&R) for the work of SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj, Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.~~

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

In case only 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. 13,65,000/-** 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 indicates 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 bidder is eligible contractors provided they produce 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 issue of bid documents:**

- 1.2.1 Conditions for Non-CPWD contractors only, if bids are also open to non-CPWD contractors. For works estimated to cost upto tendering limit of class-I composite category Contractor (However, for Horticulture and Furniture etc discipline, it may be modified as per bidding limit of CPWD class I contractors of respective discipline as the case may be)

~~Three similar works each of value not less than ` Rs..... or two similar work each of value not less than ` Rs..... or one similar work of value not less than ` ..... (all figures rounded to nearest convenient figure) in last 7 years ending last previous day of last date of submission of bids.~~

**Note :-**

~~For works costing above tendering limit of class-II Composite Category contractors but upto tendering limit of Clause-I composite category Contractor (However, for Horticulture and Furniture discipline, it may be modified as per bidding limit of CPWD class-II and CPWD class-I contractors respectively of respective discipline as the case may be) 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 composite category Contractor (However for Horticulture and Furniture discipline, it may be modified as per bidding limit of CPWD class-I contractors of respective discipline as the case may be.)**

Three similar works each of value not less than Rs -----/- or two similar work each of value not less than Rs -----/- or one similar work of value not less than Rs -----/- (all figures rounded to nearest convenient figure) in last 7 years ending last previous day of last date of submission of bids.

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 1.2.2. (This is not applicable for CPWD enlisted contractor of appropriate class in Composite Category)

**To become eligible for submission of bids, 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 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 (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website [www.cpwd.gov.in](http://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 **03 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.

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 the work.

5. 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 [www.tenderwizard.com/CPWD](http://www.tenderwizard.com/CPWD), [www.cpwd.gov.in](http://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. Proforma for Earnest Money Deposit Declaration shall be filled, signed, scanned and uploaded to the e-Tendering website within the period of bid submission.  
Copy of enlistment order and certificate of work experience and other documents as specified in the press notice/NIT shall be scanned and uploaded to the e-tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in press notice shall have to be submitted by the lowest bidder only 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 scanned and uploaded documents are found in order.
- 9A The contractors registered prior to 01.04.2015 on e-tendering portal of CPWD shall have to deposit tender processing fee at existing rates, or they have option to switch over to the new registration system without tender processing fee any time.

**The bid submitted shall be opened at 06:10 PM on 24-05-2021.**

10. The bid submitted shall become invalid if:
- (i) The bidders is found ineligible.
  - (ii) The bidder does not deposit Earnest Money deposit declaration proforma as per page 15 of NIT.
  - (iii) The bidder does not upload all documents (including GST registration) as stipulated in the bid documents.
  - (iv) 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 tender opening authority.
12. The contractor whose tender is accepted will be required to furnish performance guarantee **3% (Three percent)** of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10,000/-) or Deposit at call receipt of any scheduled bank/Banker's cheque of any scheduled bank of any scheduled bank/Pay order of any scheduled bank (in case guarantee amount is less than Rs.1,00,000/-) or Government Securities of Fixed Deposit Receipts or Guarantee Bonds of any scheduled Bank or the State Bank of India 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, then **the bidder shall be suspended for one year and shall not be eligible to bid for CPWD tenders from date of issue of suspension order. 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 sub contractors, if any engaged by the contractor for the said work and Programme Chart (Time and Progress) within the period specified in Schedule F.**
13. The description of work is as following:  
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 bidders 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.

14. 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 bid 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.
15. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bid submitted by the contractors who resort to canvassing will be liable to rejection.
16. 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.
17. 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 to 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 gazetted officer in the Central Public Works Department or in the Ministry of Urban Development. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
18. 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 previous 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.
19. The bid for the works shall remain open for acceptance for a period of Seventy Five days (75 days) from the date of opening of bid. If any bidder withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to **take necessary action regarding suspension of the contractor for one year and shall not be eligible to bid for CPWD tenders from the date of issue of suspension order against bidding contractor.**
20. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 7 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 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** or other Standard C.P.W.D. Form as applicable.

## 20. For Composite Bids

- 20.1.1 The Executive Engineer in charge of the major component will call bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimated cost put to tender for the composite bid.
- 20.1.2 The bid document will include following three components:  
**Part A:** CPWD-6, **CPWD-7/8** including schedule A to F for the major component of the work, Standard General Conditions of Contract for CPWD 2014 as amended/modified upto.....  
**Part B:** General / specific conditions, specifications and quantities applicable to major component of the work.  
**Part C:** Schedule A to F for minor component of the work. (competent authority under clause 2 and clause 5 shall be same authority as mentioned in schedule A to F for major components), General/specific conditions, specifications and schedule of quantities applicable to minor component(s) of the work.
- 20.1.3 The bidders must associate himself, with agencies as per NIT conditions.
- 20.1.4 The eligible bidders shall quote rates for all items of major component as well as for all items of minor components of work.
- 20.1.5 After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award on behalf of the President of India. After the work is awarded, the main contractor will have to enter into one agreement with EE in charge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH in charge of minor components. One such signed set of agreement shall be handed over to EE/DDH in charge of minor component(s). EE of major component will operate part A and part B of the agreement. EE/DDH in charge of minor component(s) shall operate Part C along with Part A of the agreement.
- 20.1.6 Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.
- 20.1.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.
- 20.1.8 The main contractor has to associate agency(s) for **specialized** component(s) conforming to eligibility criteria as defined in the bid document and has to submit detail of such agency(s) to Engineer-in-charge of **relevant** component(s) within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-incharge of **relevant** component(s).
- 20.1.9 In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge of **relevant specialized** component. The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.
- 20.1.10 The main contractor has to enter into **MoU** with agency(s) associated by him. Copy of such **MoU** shall be submitted to EE/DDH in charge of each **relevant** component as well as to EE in charge of major component. In case of change of associate contractor, the main contractor has to enter into **MoU** agreement with the new contractor associated by him.
- 20.1.11 Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer-in-charge of the discipline of minor component directly to the main contractor.
- 20.1.12 A. The composite work shall be treated as complete when all the components of the work are complete. The completion certificate of the composite work shall be recorded by Engineer-in-charge of major component after record of completion certificate of all other components.
- 20.1.12 B. Final bill of whole work shall be finalized and paid by the EE of major component. Engineer(s) in charge of minor component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.

Assistant Engineer(E)-1  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

Assistant Engineer (E) P  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

Executive Engineer (E)  
DED-302, CPWD,  
(Formerly known as ED-XVII),  
R K Puram New Delhi-66

**INTEGRITY PACT**

To,

.....  
.....  
.....  
.....

Sub: NIT No. 05/EE(E)/DED-302/2021-22/Delhi for the work "SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi."

Dear Sir,

It is here by declared that CPWD is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Bid (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of bid/bid documents, failing which the bider/bidder will stand disqualified from the bidding process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the CPWD.

Yours faithfully

**Executive Engineer (E)**  
**DED-302,**  
**(Formerly known as ED-XVII),**  
**CPWD, R K Puram New Delhi-66**

## **INTEGRITY PACT**

**To,**

**The Executive Engineer (E)  
DED-302  
(Formerly known as ED-XVII),  
CPWD, R K Puram New Delhi-66**

**Sub:** Submission of Bid for the work of "SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi."

**Dear Sir,**

I/We acknowledge that CPWD is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the bid/bid document.

I/We agree that the Notice Inviting Bid (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of bid documents, failing which I/We will stand disqualified from the bidding process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when bid/bid is finally accepted by CPWD. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the bid, CPWD shall have unqualified, absolute and unfettered right to disqualify the bidder and reject the bid/bid in accordance with terms and conditions of the bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

**To be signed by the bidder and same signatory competent / authorised to sign the relevant contract on behalf of CPWD.**

**INTEGRITY AGREEMENT**

This Integrity Agreement is made at ..... on this ..... day of .....20.....

**BETWEEN**

President of India represented through **Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi.** (Hereinafter referred as the '**Principal/Owner**', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

**AND**

.....  
(Name and Address of the Individual/firm/Company)

through..... (Hereinafter referred to as the  
(Details of duly authorized signatory)

**"Bidder/Contractor"** and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

**Preamble**

WHEREAS the Principal / Owner has floated the Bid (.....) (hereinafter referred to as "Bid/Bid") and intends to award, under laid down organizational procedure, contract for "SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi."

Hereinafter referred to as the **"Contract"**.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as **"Integrity Pact" or "Pact"**), the terms and conditions of which shall also be read as integral part and parcel of the Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

**Article 1: Commitment of the Principal/Owner**

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

Sr. Draftsman/DED/302

AE (E) (P)/DED/302

EE (E) /DED/302

- (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Bid, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - (b) The Principal/Owner will, during the Bid process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Bid process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Bid process or the Contract execution.
  - (c) The Principal/Owner shall endeavour to exclude from the Bid process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

**Article 2: Commitment of the Bidder(s)/Contractor(s)**

- 1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the bidding process and throughout the negotiation or award of a contract.
- 2) The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Bid process and during the Contract execution:
  - a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Bid process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Bid process or during the execution of the Contract.
  - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
  - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans,

technical proposals and business details, including information contained or transmitted electronically.

- d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a bid but not both. Further, in cases where an agent participate in a bid on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel bid for the same item.
- e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- 3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**
- 5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the bidding process).

### **Article 3: Consequences of Breach**

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- 1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Bid process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**

- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If the Principal/Owner has disqualified the Bidder(s) from the Bid process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
- 3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

#### **Article 4: Previous Transgression**

- 1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Bid process.
- 2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Bid process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
- 3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

#### **Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors**

- 1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Sub contractors/sub-vendors.
- 2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
- 3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Bid or violate its provisions at any stage of the Bid process, from the Bid process.

#### **Article 6- Duration of the Pact**

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 145 Days after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.



If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, CPWD.

#### **Article 7- Other Provisions**

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Head quarters of the Division** of the Principal/Owner, who has floated the Bid.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.
- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with **this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.**

#### **Article 8- LEGAL AND PRIOR RIGHTS**

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Bid/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....

(For and on behalf of Principal/Owner)

.....

(For and on behalf of Bidder/Contractor)

WITNESSES:

1. ....

(signature, name and address)

2. ....

(signature, name and address)

Place:

Dated :

**On Non-Judicial Stamp Paper Of Minimum Rs. 100**

**(CPWD, OM No.DG/CON/311 dated 20.10.2020)**

**(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**

1. Whereas, the **Executive Engineer (E), ED-17, R K Puram New Delhi-66.** on behalf of the President of India (hereinafter called "The Government") has invited bids under .....(NIT Number).....dated.....for.....(Name of work : "**SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.**") The Govt. has further agreed to accept irrevocable Bank Guarantee for Rs. .... (Rs..... only) valid upto.....(date)\*.....as Earnest Money Deposit from.....(name and address of the 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), ED-17, R K Puram New Delhi-66.** 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).....(hereinafter called "the contractor") for execution of work.....(Name of work: **SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.**) The Government has further agreed to accept an irrevocable bank Guarantee for Rs.....(Rupees.....only) valid upto.....(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.

2. We, .....(indicate the name of the bank).....(hereinafter referred to as "the Bank"), hereby undertake to pay to the Govt. an amount not exceeding Rs..... (Rs.....only) on demand by the Govt. within 10 days of the demand.
3. We, .....(indicate the name of the bank)..... do hereby undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Govt. stating that the amount claimed is reqd. 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)
4. We, .....(indicate the name of the bank)....., further undertake to pay the Govt. 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 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.
5. We, .....(indicate the name of the bank)....., further agree that the Govt. 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 Govt. against the said contractor and 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 Govt. or any indulgence by the Govt. 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.
6. We, .....(indicate the name of the bank)....., further agree that the Govt. as 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 Govt. may have in relation to the contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. We, .....(indicate the name of the bank)....., undertake not to revoke this guarantee except with the consent of the Govt. in writing.
9. This Bank Guarantee shall be valid upto.....unless extended on demand by the Govt. 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 .....

WITNESS .....

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.

**(CPWD, OM No.DG/SOP/14 dated 20.10.2020)**  
(Proforma for encashment of BG to be issued 14 days before its expiry)

भारत सरकार  
केन्द्रीय लोक निर्माण विभाग  
दि.वै.मं-302 आर.के.पुरम, नई दिल्ली

To  
The Manager  
...(Name & Address of Bank) ...  
.....

Subject : Request for encashment of Bank Guarantee number.....dated..... for Rs.....valid up to.....  
towards earnest money deposit/performance guarantee/security deposit/mobilization advance (As applicable)

Name of Contractor:

Dear Sir,

The above mentioned Bank Guarantee number .....dated..... is valid up to..... In terms of paragraph 2 of the said Bank Guarantee, the Govt. of India hereby demands a sum of Rs.....(Rupees.....only) payable under this Bank Guarantee since this amount is required to meet the recoveries due from.....(name of the contractor)..... The amount shall be paid latest by.....(give date).....by transfer to account number.....

The aforesaid Bank Guarantee is being sent to you through.....(name and designation).....along with this letter.

Enclosure : Bank Guarantee

Yours faithfully,  
Executive Engineer (E)  
DED-302, CPWD  
R K Puram, New Delhi.

Copy to:.....(Name & address of the contractor) .....

---

Proforma for extension of BG to be issued 30 days before its expiry)

भारत सरकार  
केन्द्रीय लोक निर्माण विभाग  
दि.वै.मं-302 आर.के.पुरम, नई दिल्ली

To

The (Name and address of Contractor)...

.....  
.....

Sub : Extension of Bank Guarantee number.....dated..... issued by .....(Name of Bank).....

(Name of work: **SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.**

**Agreement No. ....**

**Dear Sir,**

The Bank Guarantee number.....dated..... submitted by you for the above mentioned work as security deposit/performance guarantee/mobilization advance/earnest money deposit (as applicable) is valid upto.....

The validity of the aforesaid bank guarantee needs to be extended because.....(give reasons).....

You are, therefore, requested to get the validity of the said Bank Guarantee extended upto.....and submit the same to this office within 15 days from the issue of this letter, failing which it shall be encashed without further notice.

Yours faithfully,

Yours faithfully,  
Executive Engineer (E)  
DED-302, CPWD  
R K Puram, New Delhi.

[Note for EE(E): If extended Bank Guarantee is not received by the prescribed date, action for encashment must be initiated].

**CPWD-7**  
**GOVERNMENT OF INDIA**  
**CENTRAL PUBLIC WORKS DEPARTMENT**  
**Percentage Rate Tender & Contract for Works**

**Tender for the work of** : **SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.**

(i) Tender to be uploaded online by **18:10 hrs. 24-05-2021**

(ii) The time and date of opening of the bid online in presence of tenderers who may be present at **18:20 hrs. 24-05-2021** in the office of **The Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi.**

**TENDER**

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

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule 'F', viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respects of accordance with, such conditions so far as applicable.

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

~~I undertake that Earnest Money Deposit Declaration proforma shall be submitted by me as per NIT condition. If I/We, withdraw or modify my/our bid during the period of validity of tender after the opening of tender or fail to furnish the prescribed performance guarantee within prescribed period or fail to sign contract after the award of work or before the dead line defined in the tender documents, Then 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 take the necessary action such as suspension for one year and shall not be eligible to bid to CPWD tenders from date of issue of suspension order as per NIT condition.~~

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.

Further, I/We agree that in case of forfeiture of performance guarantee as aforesaid I/We shall be debarred for participation in the retendering process of the work.

**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 debar for tendering in CPWD.**

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 therefrom to any person other than a person to whom I/We, am/are authorised to communicate the same or use the information in any manner prejudicial to the safety of the state.

Dated .....

Witness: -----  
Address: -----  
Occupation: -----

Signature of the Contractor  
Postal Address -----  
Telephone No. -----  
FAX -----  
E-MAIL -----

**स्वीकृति**  
**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:-

(a). \_\_\_\_\_

(b). \_\_\_\_\_

(c). \_\_\_\_\_

For & on behalf of the President of India

Dated \_\_\_\_\_

Signature\_\_\_\_\_

Designation \_\_\_\_\_

## PROFORMA OF SCHEDULES

### SCHEDULE 'A'

Schedule of quantities (As per PWD-3)

### SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any. **As per sheet attached.**

### SCHEDULE 'E'

Reference to General Conditions of contract	:	<b>General conditions of contract for Construction Work - 2020 with amendment issued upto date of submission of tender.</b>
Name of Work	:	<b>SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.</b>
Estimated cost of work	:	<b>Rs. 13,65,000/-</b>
(i) Earnest Money	:	<b>NIL (As per DG OM No. DG/CON/Misc./13, dt. 23.11.2020), However,, EMD declaration as per Performa shall be mandatory)</b>
(ii) Performance Guarantee	:	<b>3% of tendered value</b>
(iii) Security Deposit	:	<b>2.5% of tendered value of the work to be deducted from each R/A Bill.</b>

### SCHEDULE 'F'

#### GENERAL RULES & DIRECTIONS

**C.P.W.D. General Specifications for Internal & External EI works/relvant IS Codes/MNRE standards for solar PV system/NBC-2016 as amended upto date & as per Terms & conditions attached.**

#### Officer inviting tender

**: Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi.**

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

**: See below.**

#### Definitions

**2(v) Engineer -in- Charge**

**: Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi.**

**2(viii) Accepting Authority**

**: Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi**

**2(x) Percentage on cost of materials and Labour to cover all overheads and profits**

**: 15%**

**2(xi) Standard Schedule of Rates**

**: Based on Current Minimum wages & Market Rates**

**2(xii) Department**

**: Central Public Works Department.**

**9(ii) Standard CPWD Contract Form GCC 2019, CPWD Form 7/ 8 as modified & corrected upto**

**: GCC-2020, CPWD Form 7 modified & Corrected up to date of submission of 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 thereof from the date of issue of letter of acceptance.**

**: 07 days**



- (ii) Maximum allowable extension with late fee @ 0.1% per day of : **03 days**  
Performance Guarantee amount beyond the period provided in (i) above .....

**Clause 2**

Authority for fixing compensation under : **Chief Engineer (NDZ III), CPWD, Sewa Bhawan, New Delhi**  
**Clause- 2**

**Clause 2A**

Applicable clause 2/ Clause 2A : **No**

**Clause 5**

Number of days from the date of issue of : **10 days**  
letter of acceptance for reckoning date of start.

**Mile stone(s) as per table given below:-**

S.No.	Description of milestone (Physical)	Time allowed in days (from date of start)	Amount to be with held in case of non achievement of milestone (of agreement amount)
1	Submission of drawing (*)	10 days	½ %
2	Placing order for equipments & materials	20 days	1 %
3	Supply of equipment & materials at site	50 days	2 %
4	Erection of equipments and accessories	80 days	1 %
5	Trial run & handing over	90 days	½%

Time allowed for execution of work : **03 months**  
**Authority to decide**

- (i) Extension of time : **Executive Engi-neer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi**  
(ii) Rescheduling of mile stones : **Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi**  
(iii) Shifting of date of start in case of delay in handin over of site : **Executive Engineer (E), DED-302 (Formerly known as ED-XVII), CPWD, R K Puram New Delhi**

**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		
Part B	Portions with encumbrances		
Part C	Portions dependent on work of other agencies		

Clause 5 : Applicable clause 5/ Clause 5A : **5**

**Clause 7**

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

**Rs. 5 Lakhs if Budget is available**

:

**Clause 7A**

**Whether Clause 7A shall be applicable** : **Yes**

**Clause 10A**

List of testing equipment to be provided by the contractor at site lab.

1..... 2 ..... 3.....  
4..... 5 ..... 6.....

----- **As per direction of Engineer-in-charge** -----

**Clause 10B (ii)**

**Whether Clause 10 B (ii) shall be applicable** : **No**

**Clause 10C**

Component of labour expressed as percent of : **15%**  
value of work

**Clause 10 CC**

Schedule of component of other Materials, Labour etc. for price escalation

**Not Applicable**

:

Component of civil (except materials covered under **clause 10CA**) /Electrical construction Materials expressed as percentage of total value of work.

Xm .....%

N/A

**Component of ofLabour**

Expressed as percentage of total value of work.

:

Y-----%

**Clause 11**

Specifications to be followed for execution of work :

**C.P.W.D. General Specifications for Internal & External EI works/relvant IS Codes/MNRE standards for solar PV system/NBC-2016 as amended upto date & as per Terms & conditions attached.**

**Clause 12** Authority to decide deviation upto 1.5 times of tendered Amount

**Chief Engineer (NDZ III), CPWD, Sewa Bhawan, New Delhi**

**12.2. & 12.3**

Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for this work :

N.A. (All the deviated quantity shall be paid at agreement rate)

**12.5**

(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth

: N.A.

ii) Deviation Limit for items mentioned in earth Work subead of DSR and releated work

: NA

**Clause 16**

Competent Authority for deciding reduced rates :

**Chief Engineer (NDZ III), CPWD, Sewa Bhawan, New Delhi**

**Clause 18**

List of mandatory machinery, tools & plants to be deployed by the contractor at site

1..... 2 ..... 3.....  
4..... 5 ..... 6.....

----- As per direction of Engineer-in-charge -----

**Clause 19 C: Competent Authority to decide penalty for each default**

**Clause 19D: Competent Authority to decide penalty for each default**

**Clause 19G: Competent Authority to decide penalty for each default**

**Clause 19K: Competent Authority to decide penalty for each default**

**Clause 25**

Constitution of Dispute Redressal Committee (DRC)	Competent Authority to appoint DRC	
DRC shall constitute one Chairman and two members	Chairman	Chief Engineer, NDZ-II
	DRC Member Secretry	Chief Engineer, NDZ-III
	Member 1	SE (W & TLQA) Region Delhi
	Member 2	SE, DELHI CIRCLE-3
	Presenting Officer	EE(E), DED-302, New Delhi

**Clause 32****Requirement of Technical Representative(s) and recovery Rate: -**

Requirement of Technical Representative(s) and Recovery Rate:							
S. No	Minimum Qualification of Technical Representative	Minimum experience (years)	Discipline	Designation (Principal Technical /Technical Representative)	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36 (i)	
						Figures	Words
As per latest provisions							

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

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

**Clause 38**

- (i) (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2018 printed by C.P.W.D.
- (ii) Variations permissible on theoretical quantities:
- |   |                                    |
|---|------------------------------------|
| Cement For works with estimated cost put to bid not more than Rs. 25 lakh.                    | 2% plus/minus                      |
| For works with estimated cost put to bid more than Rs.25 lakh                                 |                                    |
| b) Bitumen for all works.   | 2.5% plus only & nil on minus side |
| c) Steel Reinforcement and structural steel sections for each diameter, section and category. | 2% plus/minus                      |
| d) All other materials.   | Nil                                |

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## General, Commercial and Additional Conditions

### **1.0 General**

**1.1** This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation of Electrical installations.

### **1.2 Location:**

**Work shall be carried out at Nivedita Kunj, Sector-10 and M S Flat Sector-13, R.K Puram, Delhi.**

**1.3** The work shall be executed as per CPWD General Specifications for Electrical Works Part-I (internal) 2013, Part-II (external)1994, Part-IV(sub-station)2013 and DSR & AOR (E&M) Solar Photovoltaic Power Plant 2019 as amended upto date, relevant I.E. Rules, BIS/IES 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; specifications given in these additional conditions 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.

**1.4** The tenderer should in his own interest visit the site and get familiarize with the site conditions before tendering.

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

**1.6** The makes/models and Cat. No. etc mentioned in NIT are indicative only. The firms shall be responsible for providing the system fulfilling the specifications capacity and all other related requirement of system ensuring compatibility between different items of work.

**1.7** The firm shall be required to supply all the items of same make (among the list of approved makes) wherever available to ensure compatibility, proper matching and ease of maintenance.

**1.8** Department reserves the right to accept the upgraded version of various items, if there is technological advancement with reference to these makes/models. The decision of department in this reference shall be final and binding on the firms.

**1.9** The contractor shall discuss with EE(E) or his authorized representative / visit the site before placing the supply order / delivery of materials at site as per actual requirement **as the actual Quantity of materials required may deviate (+/-) from the quantity taken in the schedule of Work/inventory of the agreement.**

### **2.0 Commercial conditions**

#### **2.1 Type of contract**

The work to be awarded by this tender shall be treated as indivisible works contract.

#### **2.2 Submission of Tenders: -**

**2.2.1** Percentage rate tender in two-bid system.

**2.2.2** Submission and opening of e-tender will be as per details given in the information and instructions for contractors for e tendering posted in the website and CPWD-form 6 for e-tendering forming part of the NIT.

**2.2.3** The tenderers are advised not to deviate from the technical specification/ items, commercial terms & Conditions of NIT like terms of payment, guarantee, arbitration clause, escalation etc.

**2.2.4** After obtaining clarifications from all the tenderers, the department may modify the technical & commercial condition/ specifications if required, and will intimate the tenderers.

**2.2.5** In the price bid, there shall be no conditions whatsoever. In case any tenderer mentions any condition i/c conditional rebates in their price part, tender shall be rejected forthwith.

**2.2.6** The department reserves the right to reject any or all the price bids and call for fresh prices/ tenders as the case may be without assigning any reason.

**2.2.7** Scrutiny/ evaluation of the Tenders (Price Bid) shall be done by the department. In case it is found that the Tenders (Price Bid) of a tenderer is not in line with NIT specifications/requirements and/ or

contains too many deviations, the department reserves the right to reject the price bid of such firm(s) without making any reference to the tenderer(s).

### **3.0 Terms of payment**

**3.1** Payment shall be made on the basis of running account bill as per progress of execution of work.  
**Stage of payment shall be as per following: -**

- i)** Against supply of material received at site in good condition- 70% On pro-rata basis
- ii)** On completion of pro-rata installation-15%
- iii)** On commissioning and completion of work-15%

### **4.0 Security Deposit**

- (i)** The security deposit shall be collected by deductions from the running bills of the contractor at the rate mentioned below.
- (ii)** A sum @ 2.5% of the gross amount of the each running & final bill shall be deducted till the sum deducted will amount to security deposit of 2.5% of the tendered value of the work. Such deductions shall be made and held by government by way of Security Deposit unless the contractor has deposited the amount of security at the rate mentioned in cash or in the form of Government securities or Fixed Deposit Receipts. This is in addition to the performance guarantee that the contractor is required to deposit.
- (iii)** The security deposit against the sub head – I shall be released after 12 months from the date of handing over/taking over of the Solar PV system.

### **5.0 Performance Guarantee**

**5.1** The tender shall guarantee among other things, the following: -

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

**5.2** The contractor whose bid is accepted, will be required to furnish performance guarantee of 3% (three Percent) of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India 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 alongwith bid shall be returned after receiving the aforesaid performance guarantee.

**5.3** Income Tax, GST, labour cess & other statutory deductions etc shall be made at source as per the prevalent laws. The deductions of Security Deposit, Income-Tax, GST etc shall be done after calculation of the above due payments as per clauses 3.1 to 3.3 and net payment shall be reduced accordingly.

### **6.0 Rates**

**6.1** The rates quoted by the tenderer, shall be firm and inclusive of all taxes including, GST, labour cess, duties, levies, octroi etc and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site including temporary construction of storage, risks, over head charges, general liabilities/obligations and clearance from Local Body. However, the fee for the Local Body inspections shall be borne by the department.

**6.2** The department will not issue Octroi exemption certificate.

**6.3** The contractor has to carry out Routine/Preventive maintenance of above Solar Photovoltaic power generation system by deputing man power as per requirement of installed solar system capacity for cleaning of solar PV module, checking & routine maintenance the system for satisfactorily operation

as per manufacturer's standards, for a period of 60 months from the date of handing over i/c fortnightly visit by Engineer for checking the healthiness of the system i/c repair/replacement of the defective part or to attend the major complaint whenever informed by the Department as per terms & condition attached. (Supply of parts are lying in the scope of the work under guarantee period) from the date of handing over.

#### **7.0 Completeness of Tender**

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

#### **8.0 Storage and Custody of Materials**

For storage of sundry materials and erection of equipments, the agency has to make his 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.

#### **9.0 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.

#### **10.0 Completion Period**

**10.1** The completion period of **3 months** indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc. i/c arrangement of materials & equipments, delivery at site including transportation, installation, testing, commissioning and handing over the entire system to the satisfaction of the Engineer-in-charge.

**10.2** The Contractor shall be responsible for handing over the Inventory of entire system in operational to the Client/Department to the satisfaction of the Engineer-in-Charge before recording of completion Certificate & making the final payment.

#### **11.0 Guarantee**

**11.1 Plant Performance Evaluation:** -The successful bidder shall be required to meet minimum guaranteed generation with minimum Performance Ratio (PR) 75% at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the guarantee period. Minimum guarantee of generation of 1300 KWh per annum per KWp of installed and commissioned generation capacity of Solar Power Plant should be maintained for a period of 5 years for fulfilling the conditions for release of Performance Guarantee money. The bidder should send the periodic plant output details to SECI for ensuring the CUF. The PR will be measured at Inverter output level during peak radiation conditions.

**11.2** All equipments shall be guaranteed for a period of 60 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 contractor will stand performance guarantee of solar PV system supplied and installed by them for a period of 60 months from the date of the handing over of the installation. Hence, the performance guarantee deposited at the time of award of work will be released after successful overall performance guarantee period of **60 months**. 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. If the performance of Solar PV system found unsatisfactory during the guarantee period or contractor repeatedly fails to replace/repair the defective solar PV system within 15 days time after written complaint in this regard, the amount of performance guarantee shall be forfeited absolutely. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

**11.3** 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.

## **12.0 Power Supply**

Arrangement of electric power supply (Three Phase/Single Phase) at a single point as required to carry out the work for successful commissioning of the system will be provided by the department. However, distribution of electric supply to carry out the work at different locations shall lie in the scope of the contractor.

## **13.0 Acceptable Makes of Various Equipments**

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

**13.2** The firm will be required to procure material directly from the manufacturer /authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.

**14.0** The successful tenderer should furnish well in advance three copies of detailed instructions and manuals of manufacturers for all items of equipments regarding installation, adjustments operation and maintenance including preventive maintenance trouble shooting together with all the relevant data sheets, spare parts catalogue etc all in triplicate.

## **15.0 Extent of work**

**15.1** 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 mentioned in details in the tender documents in connection with this contract as this is a turnkey job.

**15.2** In addition to supply, installation, testing and commissioning of complete installation, following works shall be deemed to be included within the scope of work to be executed by the tenderer as this is a turnkey job.

- a) Minor building works necessary for installation of equipments, foundation, making of opening in walls or in floors and restoring them to their original condition / finish and necessary grouting etc as required.
- b) All supports for cables and MS channels for erection of panels etc as are necessary.
- c) Getting Local Body inspection done & obtaining approval for energizing the installation if required. However, necessary fees for inspection shall be borne by the Department.
- d) Small wiring, inter-connection etc inclusive of all materials and accessories, necessary to comply with the regulations as well as proper and trouble free operation of the equipment.
- e) Closing of the cable entry points in sub-station/D.G Set room to arrest seepage of water, rodents etc.
- f) Tools and tackles required for handling and installation.
- g) Necessary testing equipments for commissioning.
- h) Watch and Ward of materials and/or installation and equipments till their handing over to the department.
- i) Provision of supports/clamps for equipments, cables etc wherever required.
- j) Arrangement of networking on requirement.

## **16.0 Inspection and Testing**

**16.1** All the tests certificate of the equipments are required to submit along with delivery of material.

**16.2** Copies of all documents of routine and type test certificates of the equipment, / cable carried out at the manufacturers premises shall be furnished to the Engineer-in-charge and consignee.

- 16.3** After completion of the work in all respects the contractor shall offer the installation for testing and operation.
- 17.0 Validity**  
Tenders shall be valid for acceptance for a period of 75 days from the date of opening of technical bid.
- 18.0 Compliance with Regulations and Indian Standards**
- 18.1** 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) BIS & other standards as applicable
  - iv) Workmen's compensation Act
  - v) Statutory norms prescribed by local bodies, Power supply co., etc
- 18.2** 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.
- 18.3** 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 of Rs. 500/- for each default. 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.
- 19.0 Indemnity**  
The successful tenderer shall at all times indemnify the department, consequent on this works contract. 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 their party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.
- 20.0 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.
- 21.0 Cooperation with Client/Occupants**
- 21.1** The successful tenderer shall coordinate with occupants and client to carry out the work with least disturbance and shut down shall be taken after consultation with client department.
- 22.0 Painting**  
This shall include cost of painting of the entire installation.
- 23.0 Maintenance**
- 23.1** Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of Five year from the handing over of the installation.
- (a) Wages shall be paid to the worker direct by the contractor through Bank or ECS or online transfer to his bank account. It shall be duty of contractor to ensure the disbursement of wages through bank account of labour.
  - (b) After award of work, the contractor shall submit details of worker deputed at site eg. Name, address, ESIC no. EPFO no. BOCW no., labour license etc. wherever applicable or else shall submit an



undertaking/affidavit regarding exemption/non-applicability, if any and payment of salary /wages to worker by cheque/ECS.

- (c) ESI & EPF contribution are to be paid by the contractor for which contractor is to get registered with EPFO & ESIC if applicable.

**23.2** The contractor has to carry out Routine/Preventive Maintenance of above Solar Photovoltaic power generation system by deputing suitable man power as per requirement of installed solar system capacity for cleaning of solar PV module, checking & routine maintenance the system for satisfactorily operation as per manufacturer's standards, for a period of 60 months from the date of handing over i/c fortnightly visit by Engineer for checking the healthiness of the system i/c repair/replacement of the defective part or to attend the major complaint when informed by the Department as per terms & condition attached. (Supply of parts are lying in the scope of the work under guarantee period) from the date of handing over.

**24.0 Interpreting specifications**

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

- a) Schedule of quantities
- b) Technical specifications
- c) General, Commercial and Additional Conditions
- d) Drawing (if any)
- e) CPWD General specifications
- f) Relevant BIS codes or other international code in case BIS code is not available.

**25.0 Warranty:**

25 Years performance warranty shall be provided by manufacturer on SPV modules with degradation in performance of maximum 10% upto 10 years and 20% beyond 10 years and upto 25 years as per industrial standard warranty conditions on complete system from the date of commissioning of the system. If SPV modules do not perform satisfactorily as above then the manufacturer of the solar PV modules shall make proper check of the quality of material and should replace the unsatisfactorily solar PV modules with free of cost. Otherwise department may take action to debar the manufacturer for CPWD works and may intimate to MNRE to take suitable action against such defaulting manufacturer.

**26.0** The scope of work for the bidder include obtaining No Objective Certificate (NOC) from Distribution Company (DISCOM) for grid connectivity, complete design, engineering, manufacture, supply, storage, civil work, erection, testing and commissioning of the grid connected rooftop Solar PV project

**27.0** The support mounting structure & foundation of solar PV modules shall be so designed to withstand speed 150 km/hr for wind zone of the location as given in relevant Indian wind load codes/standards. The contractor shall arrange vetting/approval of the submitted drawing of mounting Structure for solar PV modules by the department.

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### **SPECIAL CONDITIONS**

- 1.** Contractor shall guarantee minimum generation of 1300 KWh per annum per KWp of installed and commissioned generation capacity of Solar Power Plant.
- 2.** For any shortfall in the generation of solar generation, the recovery at the prevailing rates at which Power Purchase Agreement shall be signed by Engineer-in-charge with DISCOM shall be effected from performance guarantee / security deposited of the firm and it shall not be released.
- 3.** The trial run of electrical work / equipments shall be carried out by the firm in presence of Engineer-in-charge or his representative at the site at least once as per requirement of department. A certificate shall be issued by Engineer-in-charge for having witness the satisfactory trial run before release of security deposit which is due after guarantee period.
- 4.** Before installation work is started, the mechanical design of module mounted structure against 150 Km per hr. wind velocity.
- 5.** The Power Purchase/Net metering Agreement shall be taken up by Engineer-in-charge or his representative separately with DISCOM. The draft Power Purchase Agreement shall be submitted to competent authority of CPWD for approval before signing with DISCOM. All necessary fees shall be paid by the department. However, all co-ordination shall be done by the Firm.
- 6.** The application for Net Metering and necessary fees shall be paid by the Department However all co-ordination shall be done by the Firm.
- 7.** Work is to be carried out in VIP zone hence it will be the responsibility of the contractor to get issued necessary entry passed for the entry in the building from the competent authority and no claim on account of wastage of labour etc. shall be entertained by the department.
- 8.** The contractor shall visit the site before rate quoted so that during execution of work, no dispute arises.

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## **TECHNICAL SPECIFICATIONS**

The equipment and material for Solar Photo voltaic Power Plant with associated system (typical) shall include following but not be limited to the following: (Only The technical features of major equipment's are described here under).

### **1. SPV Modules:**

- 1.1.** Mono/Poly crystalline cells are acceptable, SPV mono/poly crystalline modules to be supplied should have output of 330 Wp per module, to be supplied and shall work out accordingly.
- 1.2.** Stabilized output of the Solar Power Plant should not be less than **approx. 330 W for each solar PV module** under Standard Test Condition from date of Commissioning of solar plant.
- 1.3.** Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture & provide high voltage electrical insulation.
- 1.4.** 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.
- 1.5.** SPV module shall contain mono/poly crystalline high power silicon solar cells. The solar cell shall have surface anti-reflective coating to help to absorb more light in all weather conditions.
- 1.6.** The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing during entire life of the solar modules.
- 1.7.** Photo conversion efficiency of SPV Module should be greater than 16.50%. Module shall be made of high transmittance glass front surface giving high encapsulation gain.
- 1.8.** Cell used in offered module should be of reputed make. The bidder should specify the make of PV cell in Bid itself and it should be got approved from the Engineer-in-charge before installation.
- 1.9.** Module rating is considered under standard test conditions, however Solar Modules shall be designed to operate and perform under site condition including high temperature & dust (sometimes).
- 1.10.** All materials used shall be having a proven history of reliable, light weight and stable operation in external outdoor applications.
- 1.11.** Solar PV Module design shall conform to following requirement:
  - a.** Weather proof DC rated connector and a lead/cable coming out as a part of the module, making connections easier and secure, not allowing for any loose connections.
  - b.** Resistant of water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.
- 1.12.** 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.

- Name of the manufacturer of PV module
- Name of the manufacturer of Solar cells
- Month and year of the manufacturer (Separately for Solar cell and module)
- Country of origin (Separately for Solar cell and module)
- I-V curve for the module
- Wattage,  $I_m$ ,  $V_m$  and FF for the module
- Unique Serial No and Model No of the module
- Date and year of obtaining IEC PV module qualification certificate
- Name of the test lab issuing IEC certificate
- Other relevant information for traceability of Solar cell and module as per ISO 9001 & ISO 14001.

## **2.0 MODULE MOUNTING STRUCTURE (FIXED/BALLAST):**

- 2.1** The structure design shall be appropriate and innovative and must follow the existing structure and profile. The bidder may choose to offer module mounting structure as per their design fulfilling the details in NIT.
- 2.2** The module alignment & tilt angle shall be calculated to provide the maximum annual energy output to take maximum insolation. This shall be decided based on the location of array installation.
- 2.3** The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement considering cleaning of PV modules and maintenance.
- 2.4** **The solar tree structure shall be designed so that available solar tree members may transfer the load of** module mounting structure to the ground. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly. It should be less than  $60 \text{ kg/m}^2$ .
- 2.5** The mounting mild steel structure shall be as per latest BIS 2062 (amended up to date) and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date).
- 2.6** The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same.
- 2.7** Nut & bolts, supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.
- 2.8** All fasteners shall be of stainless steel of grade SS 304.
- 2.9** The mounting structure shall be fixed at foundation of the solar tree.
- 2.10** The support structure & foundation shall be so designed to withstand speed of  $150 \text{ km/hr}$  for wind zone of the location as given in relevant Indian wind load codes/standards.
- 2.11** Design drawings with material selected shall be submitted for prior approval of Engineer-in-charge. The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and general arrangement drawings (GAD). The drawings along with detailed structure design and material selected and their standards shall be submitted in four sets for approval by the department.

## **3 ARRAY JUNCTION BOXES:**

- 3.1** If DC isolation switch, surge protection and fuse protection is not inbuilt to the inverter then array junction boxes is required to be used. The junction box shall be

dust, vermin, and waterproof for outdoor application IP 65 and made of 2mm thick CRCA sheet.

- 3.2** The terminal will be connected to copper bus-bar arrangement of proper size to be provided. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.
- 3.3** Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- 3.4** Each Array Junction Box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of minimum 600 V with suitable arrangement for its connecting.
- 3.5** The Array Junction Box will also have suitable surge protection device.
- 3.6** The junction Boxes shall have suitable arrangement for the followings (typical):-
- Combine groups of modules into independent charging sub-arrays.
  - Provide arrangement for disconnection for each of the groups.
  - Provide a test point for each sub-group for quick fault location.
  - To provide group array isolation.
- 3.7** The current carrying ratings of the junction Boxes shall be suitable with adequate safety factor, to interconnect the Solar PV system.

#### **4. POWER CONDITIONING UNIT (PCU)**

- 4.1** Power Conditioning Unit (**PCU**) shall be **grid interactive in nature and mainly consist of MPPT controller, inverter of suitable rating.** Associated control and protection devices etc., all integrated into PCU. It shall provide necessary protections for Grid Synchronization and Data Logging/Monitoring. The PCU should convert DC power produced by SPV modules in to AC power and must synchronize automatically its AC output to the compatible AC Voltage and frequency of Grid.
- 4.2** The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides 3-ph, 415V AC (+15% to – 10%), 50+/- 3% Hz. to synchronize with the grid.
- 4.3** The PCU shall be of very high quality having efficiency not less than 97% and shall be capable of running in integrated mode.
- 4.4** Degree of protection of the PCU shall be at least IP-65 for outdoor or better protection.
- 4.5** Provision for built in port with data logging to remotely monitor plant performance through external PC shall be provided (only provision).
- 4.6** The PCU shall be designed for continuous, reliable power supply as per specification.
- 4.7** The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently & automatically.
- 4.8** Both AC & DC lines shall have suitable fuses/MCB/MCCBs, Metal Oxide Arrestors/surge arrestors and contactors to allow safe start up and shut down of the system. Fuses/MCB/MCCBs used in the DC circuit should be DC rated.
- 4.9** PCU shall operate in sleeping mode when there will be no power connected to it.
- 4.10** Protections:
- Over voltage both at input & output.
  - Over current both at input & output.
  - Over/under grid frequency.
  - Heat sink over temperature.

- Short circuit.
- Protection against lightening.
- Surge arrestors to protect against Surge voltage induced at output due to external source.
- Any other protection in view of grid supply.
- Anti- Islanding Protection

**4.11** It should have user friendly, LED/LCD display for programming and view on line parameters such as:

- Inverter per phase Voltage, current, KW, KVA and frequency,
- Grid Voltage and frequency,
- Inverter (Grid) on Line status,
- PV panel voltage,
- Solar charge current and ambient temperature,
- Individual power stage heat sink and cabinet temperature,
- Solar Radiation (with external pyranometer with in scope)
- Inverter on
- Grid on
- Inverter under voltage/over voltage
- Inverter over load
- Inverter over temperature.
- Ambient Temperature

**4.12** 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.

**4.13** The PCU shall be able to withstand an unbalanced load conforming to relevant IEC standard and Indian electricity condition. The PCU shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters – beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation feature, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.

**4.14** The PCU shall go to shutdown/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay.

- When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode.
- The PCU control shall prevent excessive cycling of shut down during insufficient solar radiance.

**4.15** Operation outside the limits of power quality should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are

- Neutral voltage displacement
- Over current
- Earth fault
- Reverse power

In each of the above cases, tripping time should be very less.

**4.16** The Bidder shall provide data sheet for Power Conditioning Unit along with their offer as per Guaranteed Technical Particular.

- 4.17** PCU / Inverter should be tested from the test centers / NABL / BIS / IEC accredited testing calibration laboratories.
- 5. DC DISTRIBUTION BOARD (DCDB)**
- DC distribution board shall be provided in between solar array and inverter it shall have MCB/MCCB of suitable rating for connection and disconnection of array section it shall have meters for measuring the array voltage and array current (this can be inbuilt with inverter instead the separate.)
- 6. AC DISTRIBUTION BOARD (ACDB)**
- 6.1** The AC power output of the inverter shall be fed to the ACDB (metering panel & isolation panel) which also houses energy meter. The 415V AC output of the isolation panel shall be fed to the grid. AC energy is then synchronized with the grid and power is consumed by the grid.
- 6.2** ACDB shall be floor / wall mounted type but drawing is to be got approved before installation and shall have all the measuring instruments such as voltmeter, ammeter, frequency meter, Energy Meter {For measuring the deliverable units kWh}, selector switches etc as per specification mentioned in BOQ.
- 6.3** All the power cables shall be taken through top/ Bottom of the panel as per site requirement.
- 6.4** The ACDB shall fitted with suitable rating & size aluminium bus, MCCB, indicators for all incomer and outgoing terminals, LED, voltmeter & Ammeter with suitable selector switches to monitor & measure the power to be evacuated.
- 6.5** Nut & bolts including metallic shall have to be adequately protected against atmosphere and weather prevailing in the area.
- 6.6** Modifications/ addition if any, in existing L T panel shall be done at site for connection the supply from ACDB and covered in scope of Bidder.
- 7. WIRING**
- 7.1** 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.
- 7.2** The following color scheme of the wiring shall be used as per IS: 375. AC three phase circuits:
- No.1 Phase: Red.
  - No.2 Phase: Yellow.
  - No.3 Phase: Blue
  - ii) Neutral Conductor: Black iii) Connection to Earth: Green b) D.C. circuits: Grey
- 8. CABLE ACCESSORIES**
- 8.1** Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted.
- 8.2** 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 prevent entry of snakes/lizard etc. inside the panel.
- 8.3** 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.
- 9. EARTHING**

- 9.1** Each array structure of the SPV shall be grounded properly. The array structures are to be connected to earth pits as per CPWD General Specifications. Junction boxes shall be connected to the main earthing conductor/ electrode.
- 9.2** Earthing system installation shall be in strict accordance with CPWD General Specifications Part-I internal 2013 as amended upto date.
- 9.3** Necessary Test Point provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- 9.4** 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.
- 9.5** Earth resistance of the earth pits shall be tested in presence of the representative of Engineer-in-charge.

## **10. LIGHTNING & OVER VOLTAGE PROTECTION**

### **(A)**

- a.** The SPV Power Plant should be provided with Lightning and over voltage protection connected to proper earth system. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.
- b.** The lightning system / Conductors shall be made as per applicable CPWD General Specifications.
- c.** COMMUNICATION INTERFACE AND DATA MONITORING:-  
The project envisages a communication interface which shall be able to support.
- Real time data logging
  - Event logging
  - Supervisory control
  - Operational modes
  - Set point editing
  - Software and communication compatibility:
- d.** Port with RS 485/RJ 45/RS 232 compatible to transfer the data remotely via GSM/Wifi network to main global access portal with user name and password restriction. It should be possible to provide to stage monitoring/general monitoring/admin monitoring.
- e.** The supplier shall supply necessary software and hardware required. The supplier shall also provide training for the use of software. The software should be compatible to Microsoft windows systems (Windows VISTA OR Higher version system.)
- f.** Copy of operation manual shall be supplied.
- g.** The supplier shall provide facility to print the reports regularly on daily, monthly and yearly basis.

### **(B)** The following parameters shall also be measured and displayed continuously.

- (a) Solar system temperature.
- (b) Ambient temperature.
- (c) Solar irradiation/isolation.
- (d) DC current and voltages
- (e) DC injection into the grid (one time measurement at the time of installation)
- (f) Efficiency of the inverter.
- (g) Solar system efficiency
- (h) Display of I-V curve of the solar system



- (i) Any other parameter considered necessary by supplier of the solar PV system based on prudent practice.
  - (j) KW reading DC/AC i.e. input/output (instantaneous power)
  - (k) Generation of the electricity on the minutes based and daily basis with graphical representation has to be provided.
- (C)** Data logger /PC based monitoring system must record these parameters for study of effect of various environmental & grid parameter on energy generated by the solar system and various analysis would be required to be provided through bar charts, curves, tables, which shall be finalized during approval of drawings.
- (D)** The communication interface shall be an integral part of inverter and shall be suitable to be connected to local computer and also remotely via the Web using either a standard modem or a GSM/WIFI modem.

#### **11. SPARES:**

A list of requisite spares in case of PCU/Inverter comprising of a set of control logic cards, IGBT driver cards etc. junction boxes, fuses, MOVs/arrestors, MCCBs etc along with spare set of PV modules be indicated, which shall be supplied along with the equipment. A minimum set of spares shall be maintained in the plant itself for the entire period of warranty and operation & maintenance which upon its use shall be replenished.

#### **12 DANGER BOARDS AND SIGNAGES**

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

#### **13 INTEGRATION OF PV POWER WITH GRID:**

- i. In case of Power plant 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 and get the same done by DISCOM.
- ii. CEA guideline 2013 or amended upto date guidelines for inter connecting solar power with Grid shall be followed.
- iii. Certification of Islanding protection in the inverter/PCU from the manufacturer of the equipment shall be mandatory. This shall be arranged by the supplier from the manufacturer.
- iv. Verification report/test report shall be issued by the DISCOM or their authorized agency and the same shall be taken by the contractor within scope of work.

#### **Grid Islanding:**

- 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 Roof top 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.
- 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.

## **STANDARDS FOR SOLAR PHOTOVOLTAIC (PV) POWER PLANTS/SYSTEMS**

### **A. PV MODULES:**

The PV modules must conform to the latest edition of any of the following IEC/equivalent BIS standards for PV module design qualification and type approval:

Crystalline silicon terrestrial PV modules	IEC 61215/ISI 14286
Thin film silicon terrestrial PV modules	IEC 61646
Concentrator PV modules & assemblies	IEC 62108

In addition, the modules must conform to IEC 61730 Part1-requirements for construction & Part2 – requirements for testing, for safety qualification. PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) must quality. Salt Mist Corrosion Testing as per IEC 61701.

### **B. BALANCE OF SYSTEM (BoS) ITEMS/COMPONENTS:**

The BoS items/components of the SPV power plants/systems deployed under the mission must conform to the latest edition of IEC/equivalent BIS standards as specified below:

<b>BoS</b>	<b>Applicable IEC/equivalent BIS standard</b>	
<b>Item/component</b>	<b>Standard Description</b>	<b>Standard Number</b>
Power conditioner/	Efficiency Measurements	EN61000-6-3
Inverters*	Environmental Testing	EN 50178
MPPT units*	Design Qualification	EN 50178
	Environmental Testing	UL 1741
		CSA 107.1
Cables	General test and measuring methods PVC insulated cables for working voltage upto and including 1100 V-Do-UV resistant for outdoor installation	IEC 60189 IS 694 / IS 1554 IS/IEC 69947
Switches/Circuit	General Requirements	IS/IEC 60947 part I,II & III
Breakers/Connectors	Connectors - Safety	EN 50521
Junction Boxes/ Enclosures	General Requirements	IP 65 (for outdoor)/IP 21 (for indoor) IEC 62208
SPV System Design	PV Stand-alone Systems Design verification	IEC 61215 IEC 61730 IEC 61701
Installation Practices	Electrical installation of buildings requirements for SPV power supply systems	IEC 61730

\*Must additionally confirm to the relevant national/international electrical safety standards.

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## **Technical specifications**

### **SPECIFICATION FOR SPV PANEL**

<b>Sl. No</b>	<b>Description</b>	<b>Specification Requirement</b>
1	Rated power range output at STC	330 Wp or above
2	No. of solar cells in each solar PV module	72
3	Voc/Isc	As per OEM
4	MPP Voltage (Vmpp) V	As per OEM
5	MPP current (imp) A	As per OEM
6	Normal operating cell temperature	As per OEM
7	Operating Temperature range	-40° c to 85° c
8	Module dimensions (LxWxH) Appx.	As per manufacturer standard
9	PV Module type	Mono/Poly Crystalline
10	Min. efficiency of solar cell	16.50% or better
11	Solar module frame material	Aluminium
12	Weather resistant junction	IP65 or better
13	Front Glass	Toughened not less than 3.2 mm thick.
14	Glass iron content	Low Iron
15	glass transmissivity	High transmissivity
16	Frame	Minimum 35 mm wide Anodized aluminium
17	Encapsulation	Ethyl Vinyl Acetate (EVA)
18	Trilaminate back surface	Tedlar / Polyester
19	By-pass diode	To be provided
20	Standard	ICE61215/IS14286 & IEC 61730 Part 1 & Part 2 and other relevant /applicable standards amended upto date.
21	Performance warranty	Upto 10 years – 90% of power output
		Beyond 10 years and upto 25 years- 80% of power output.

## **TECHNICAL SPECIFICATION OF SOLAR INVERTER (GRID TIED)**

<b>Sl. No.</b>	<b>Description</b>	<b>Specification Requirement</b>
1	Type	Grid tied
2	Max. DC Array Input Voltage	1000V max.
3	DC voltage tolerance	` -20%+15% of the DC array input voltage in Sr. No. 1 above
4	Type of solar charge controller	MPPT based solar charge controller
5	Switching Device	MOSFET / IGBT BASED
6	Continuous inverter output rating	As per BOQ
7	Output wave form	Pure Sine wave output
8	total harmonic distortion	< 3% with resistive load
9	Nominal AC output voltage and frequency	415V, 3 phase, 50Hz
10	Output frequency	50 Hz + 0.5 Hz
11	Grid frequency tolerance	` +/- 3%
12	Grid frequency synchronization range	` + 3Hz
13	No-Load losses	<1%
14	Power factor	> 0.9
15	PCU efficiency	>97 % at nominal voltage & power
16	Noise level	< 65 db
17	Certifications	IEC 61727, CE, IEC 62109-1, IEC 62109-2 and other relevant/applicable certification/standards amended upto date.
18	Idle current	< 4 % of rated capacity
19	Regulation	Line regulation and load regulation -2%
20	Over load features	150% for one minute'
21	Cooling	Forced air cooling with temperature controlled cooling
22	Operating Temperature	-10°C to 60 °C
23	Relative Humidity	95% Maximum
24	LED/LCD display	Indications display shall indicate system functional parameters and protection functional indicators
25	Data Monitor and display controls	RS 485, Ethernet or RS 232 connectivity
26	Protections	1) Input over Voltage
		2) Low/High frequency

Sl. No.	Description	Specification Requirement	
		3)	Short Circuit
		4)	Under/over output voltage
		5)	Over Temperature
		6)	Grid input under voltage/over voltage with auto recovery
		7)	DC disconnect device
		8)	DC reverse polarity
		9)	Anti Islanding protection as per the standard
27	Enclosure Protection Safety	IP 65 (for outdoor) Galvanic isolation at input & output through transformer	
28	Warranty	5 years	

**SPECIFICATIONS FOR ARRAY JUNCTION BOX (DCDB)**

<b>S. No.</b>	<b>Description</b>	<b>Specification Requirement</b>
1	No. of module in series	As per manufacturer standard
2	No. of module in parallel	As per manufacturer standard
3	Switch gears	MCB / MCCB
4	Connectors	1.1 KV grade 100 Amps capacity
5	Wiring	FRLS copper conductor single core cable 1.1 KV grade
6	Enclosure Protection	IP 65 (outdoor) dust & vermin proof weather resistance
7	Enclosure	2mm thick powder coated CRCA sheet/ Polycarbonate. The thickness of polycarbonate sheet shall be as per OEM standards.
8	Size	As per manufacturer standard
9	Capacity of each SPV panel and nos.	To be intimated by Firm

## **SPECIFICATIONS FOR PV PANEL SUPPORT/MODULE MOUNTING STRUCTURE**

<b>Sl. No</b>	<b>Description</b>	<b>Specification Requirement</b>
1	Material	Hot dip galvanized steel with min. 80 micron galvanizing Or as per manufacturer Standard Capable of with stand wind
2	Thickness of member	Speed of 150 kmph. Stat analysis to be submitted. (4mm minimum)
3	Over all dimensions	As per manufacturer standard
4	Wind rating	150Km / hour As per manufacturer standard.
5	Tilt angle and adjustment	Tilt angle shall be calculated to provide the maximum annual energy output to take maximum insulation. This shall be decided based on the location of array installation.
6	Pitch of structure	As per manufacturer standard
7	Hardwares & fastener	SS 304
8	Foundation	CC 1:2:4

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## **SCHEDULE - A**

### **TECHNICAL PARTICULARS** **(TO BE FILLED BY THE BIDDER)**

**Name of work:-** SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.

**NIT No.:-** 05/EE(E)/DED-302/2021-22/Delhi

**Name of Contractor:-**

<b>S.No.</b>	<b>Details of Particulars</b>	<b>To be filled by tenderer</b>
<b>(A) Solar PV Module</b>		
<b>1.</b>	Rated power range output at STC	
<b>2.</b>	No. of solar cells in each solar PV module	
<b>3.</b>	Voc/Isc	
<b>4.</b>	MPP Voltage (Vmpp) V	
<b>5.</b>	MPP current (imp) A	
<b>6.</b>	Normal operating cell temperature	
<b>7.</b>	Operating Temperature range	
<b>8.</b>	Module dimensions (LxWxH) Appx.	
<b>9.</b>	PV Module type	
<b>10.</b>	Min. efficiency of solar cell	
<b>11.</b>	Solar module frame material	
<b>12.</b>	Weather resistant junction	
<b>13.</b>	Front Glass	
<b>14.</b>	Glass iron content	
<b>15.</b>	glass transmissivity	
<b>16.</b>	Frame	
<b>17.</b>	Encapsulation	
<b>18.</b>	Trilaminate back surface	
<b>19.</b>	By-pass diode	
<b>20.</b>	Standard	
<b>21.</b>	Performance warranty	
<b>(B) Solar Inverter</b>		
<b>1.</b>	Type	
<b>2.</b>	Max. DC Array Input Voltage	
<b>3.</b>	DC voltage tolerance	
<b>4.</b>	Type of solar charge controller	
<b>5.</b>	Switching Device	
<b>6.</b>	Continuous inverter output rating	
<b>7.</b>	Output wave form	
<b>8.</b>	total harmonic distortion	
<b>9.</b>	Nominal AC output voltage and frequency	



<b>S.No.</b>	<b>Details of Particulars</b>	<b>To be filled by tenderer</b>
<b>10.</b>	Output frequency	
<b>11.</b>	Grid frequency tolerance	
<b>12.</b>	Grid frequency synchronization range	
<b>13.</b>	No-Load losses	
<b>14.</b>	Power factor	
<b>15.</b>	PCU efficiency	
<b>16.</b>	Noise level	
<b>17.</b>	Certifications	
<b>18.</b>	Idle current	
<b>19.</b>	Regulation	
<b>20.</b>	Over load features	
<b>21.</b>	Cooling	
<b>22.</b>	Operating Temperature	
<b>23.</b>	Relative Humidity	
<b>24.</b>	LED/LCD display	
<b>25.</b>	Data Monitor and display controls	
<b>26.</b>	Protections	
<b>27.</b>	Enclosure Protection Safety	
<b>28.</b>	Warranty	
<b>(C) Array Junction Box (DCDB)</b>		
<b>1.</b>	No. of module in series	
<b>2.</b>	No. of module in parallel	
<b>3.</b>	Switch gears	
<b>4.</b>	Connectors	
<b>5.</b>	Wiring	
<b>6.</b>	Enclosure Protection	
<b>7.</b>	Enclosure	
<b>8.</b>	Size	
<b>9.</b>	Capacity of each SPV panel and nos.	
	<b><u>(D) PANEL SUPPORT/MODULE MOUNTING STRUCTURE</u></b>	
<b>1.</b>	Material	
<b>2.</b>	Thickness of member	
<b>3.</b>	Over all dimensions	
<b>4.</b>	Wind rating	
<b>5.</b>	Tilt angle and adjustment	
<b>6.</b>	Peach of structure	
<b>7.</b>	Hard wears & fastener	
<b>8.</b>	Foundation	

(Signature of the contractor)

**SCHEDULE - B**

**DEPARTURE FROM SPECIFICATIONS**  
**(TO BE FILLED BY THE BIDDER)**

**Name of work:-** SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.

**NIT No.:-** 05/EE(E)/DED-302/2021-22/Delhi

**Name of Contractor: \_**

S.No.	Ref to NIT Para	Description of Deviation / Departure	Reason for Departure
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

- (i) Certified that except for departure mentioned above, tender is in accordance with site conditions for support to GRID connected SOLAR PV applications as amended upto date, CPWD General Specifications for Electrical works Part - I Internal - 2013 as amended upto date, CPWD General Specifications for Electrical works Part - II external and CPWD General Specification for Civil works as amended upto date and in accordance with detailed requirements specified in tender specifications /BOQ.
- (ii) Certified that the items of the work as described in the Schedule of Quantities in Price Bid have been read in conjunction with the Technical Specifications and the Scope of Work has been fully understood by us. Further, we also certify that there are no departures from the nomenclature of items specified in the Schedule of Quantities except those specifically brought out in the "Schedule ***of departure from Specifications***".

(Signature of the contractor)

**SCHEDULE – C**

**LIST OF TECHNICAL LITERATURE & CATALOGUE  
AND ANY OTHER INFORMATION  
(TO BE FILLED BY THE BIDDER)**

**Name of work:-** SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.

**NIT No.:-** 05/EE(E)/DED-302/2021-22/Delhi

**Name of Contractor: \_**

**The tenderer should furnish the list of technical literature & catalogues of the equipments offered: -**

S.No.	Data/Information	Remarks
1.		
2.		
3.		
4.		

(Signature of the contractor)

## **List of Approved makes of Equipments and Materials**

<b>Sl.No.</b>	<b>Item</b>	<b>Make</b>
1	Poly-Crystalline solar Panel 300 WP and above	TATA SOLAR POWER / VIKRAM SOLAR / EMVEE / BHEL / CEL/ADANI
2	String Inverter/PCU	SUN GROW / POLYCAB / DELTA / SMA / ABB
3	Junction box	HENSEL / HONEY WELL / VNT / SUN GARNER / EMVEE
4	Module mounting structure	As per MNRE/Manufacture standard( Design & drawing to be got approved by the structure engineer and later by the department)
5	MCB	SCHNEIDER/Legrand/Siemens/L & T/HAGER
6	MCCB	SCHNEIDER/Legrand/Siemens/L & T/HAGER
7	Multifunction meter	L&T / SCHNEIDER / AE / TRINITY
8	CT's	AE / KAPPA / SIEMENS / ABB / L&T
9	Indicating lights	SCHNEIDER//L & T/SIEMENS/C&S
10	XLPE insulated aluminium conductor cable	Polycab/LAPP/RR KABEL/FINOLEX/Havelles
11	DC tinned copper conductor cable	Polycab/LAPP/RR KABEL/FINOLEX/Havells
12	LT Panel	CPRI Approved

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### **SCHEDULE OF WORK**

N/W: SITC of grid interactive Solar Tree based on Photovoltaic power generation System at Nivedita Kunj , Sector-10, and M S Flat, Sector-13, R.K. Puram, New Delhi.

S.No	Description of Item	Qty.	Rate	Unit	Amount
1	Supply , Installation , Testing and Commissioning of grid interactive Solar Tree of capacity 5 KWp based on Photovoltaic Power Plant conforming to MNRE specification as amended, consisting of Mono/Poly Crystalline silicon solar cells, net metering facility, necessary protections, earthing mounted on GI/MS Structure of suitable strength with following components complete as required:-				
a)	Solar photovoltaic Module of capacity 330 wp or above, manufactured in Indian, conforming to IS 14286/Iec 1215, IS/IEC 61730-part-1, Is/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 16.5% pv Modules used in solar power plants/ system 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.				
b)	Power Conditioning unit (PCU) of 350-800 V DC Input voltage range and 400 V AC , three phase , 4 wire , 50 HZ +/- 2.5 Hz output voltage suitable to generate AC power with efficiency not less than 97% total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree. The PCU shall adjust the voltage and frequency level to suit the grid voltage frequency.				
c)	Data monitoring system complete with accessories.				
d)	Fixing of 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.				
e)	Lightening and surge voltage protection.				
f)	Connections & Interconnection by supplying & fixing required size XLPE insulated copper conductor 1.1 kv grade armoured power and control cables between solar modules , main power cable to grid supply PCU unit along with supplying & fixing necessary channel/conduite lugs and other accessories etc. As required. ( Supplying of cable such as DC cable ( copper conductor, unarmoured, XLPE cable of suitable size as per array , array to array junction box /DCDB, DCDB ( array junction box ) to power conditioning unit and three phase four core AC power cable (copper conductor , armoured , XLPE cable of suitable size as per specification /IS codes ) from PCU to net metering /bi-directional meter at desired location satisfaction to the Engineer-in-charge is including in the scope of work and nothing shall be extra paid on this account. Laying of DC and AC cables is also included in the scope of work. DC cable between array to array and array to array junction box and array junction box to PCU shall be laid in medium class pvc conduit. AC cable on surface shall be fixed as per CPWD specification and AC cable in road/open earth shall be laid in DWC pipe and in road crossing the cable shall be laid in HDPE pipe by trench less method.				
g)	The structure of solar tree shall be made out of MS conforming to IS 226 and 2062 and members as mentioned below including preparing and taking approval from Structural Consultant for shop drawings showing all fixing details prior to installation. All MS members shall be galvanized and shall be coated with two coats of approved etch primer and minimum two coats of epoxy paint of approved make and colour including necessary surface preparation etc. all complete and direction of the Engineer-in-charge. The structure shall be consist of following elements and shall be fixed to the suitable foundations as per accredited/Empaneled structure engineer ( The structure engineer shall be engaged by the agency with in the quoted rates ):-1. Solar tree trunk should be made out with hot dipped galvanised MS body pipe of 7 to 8 inches dia x 8 mm thickness with minimum three branches made out of minimum 4 inches dia hot dipped galvanised MS body pipe of C class . The trunk of solar tree shall be fixed on MS base plate of minimum 1000 mm dia x 25mm thick fixed on CC foundation ( Foundation as per Manufacture standards and structure engineer ) as base for solar trees including providing support to the branches and solar panels by suitable size hot dipped galvanised MS body members/ perlin as per manufacture standards and structure engineer requirement . The height of the solar tree should not be less than 5 mtr from the base of the solar tree trunk .	2 Job	682500	P/Job	1365000.00