

# INDIAN INSTITUTE OF TECHNOLOGY BHILAI

## NOTICE INVITING TENDER

### Open Tender Notice No. 01/IITBhilai/ Estate/2023-24

**Name of work:** Site survey, design, engineering, supply, installation, testing and commissioning of 475 kWp solar PV project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance of the system for a period of 25 years under RESCO model after operational acceptance.



**Earnest Money** : ₹ 5,22,500 /-

**Performance Guarantee** : ₹ 13,06,250 /-

**Period of Completion** : 4 months (Four months) for commissioning and 25 years of operation and maintenance.

**AEE (E) & Engineer In-charge**

**IIT Bhilai**



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
NEAR PHC JEVRA SIRSA, KUTELABHATA,  
BHILAI, DURG, C.G. - 491001**

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***SECTION – I: INVITATION OF TENDER***

**Definitions:** In this document the following words and expression have their meaning here by assigned to them.

<p><b>Bidder</b> means the individual, proprietary firm, firm in partnership, limited company, private or public or corporation who is participating in this bid as a sole bidder or in consortium as indicated in this document.</p>
<p><b>CPWD:</b> Central Public Works Department acting through Executive Engineer &amp; Senior Manager (E) (under SE cum PD) CPWD Bhilai.</p>
<p><b>Construction Agency:</b> The Construction Agency engaged by CPWD. In the present case, M/s Larsen and Toubro Ltd acting through Project Director, L&amp;T, Bhilai.</p>
<p><b>Institute</b> means the Indian Institute of Technology Bhilai.</p>
<p><b>CONTRACT</b> The Contract means the documents forming the tender and acceptance thereof and the formal agreement executed between the Engineer In-charge on behalf of Director IIT Bhilai and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in- Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.</p>
<p><b>Contractor</b> means the bidder appointed by Institute to execute the contract.</p>
<p><b>The Site</b> shall mean the land, places on, into or where work is to be executed under the contract or any adjacent land, path, or street or where work is to be executed under the contract or any adjacent land, path or street which may be temporally allotted or used for the purpose of carrying out the contract.</p>
<p><b>Director</b> means Director, IIT Bhilai.</p>
<p><b>The Engineer In-charge</b> means the Engineer Officer who shall supervise and oversee the work and who shall sign the contract on behalf of the Director. IIT Bhilai.</p>
<p><b>Excepted Risk</b> are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Government's faulty design of works.</p>
<p><b>Date of commencement of work:</b> The date of commencement of work shall be the date of start as specified in work order (considering the necessary time-extension obtained by Engineer In-charge if any), or the first date of handing over of the site, whichever is later, in accordance with the phasing if any, as indicated in the tender document.</p>



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## Open Tender Notice No. 01/IITBhilai/ Estate/2023-24

Indian Institute of Technology, Bhilai, on behalf of Director, IIT Bhilai invites online tender for **Site survey, design, engineering, supply, installation, testing and commissioning of 475 kWp solar PV project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance of the system for a period of 25 years under RESCO model after operational acceptance.**

<b>Details of the item</b>	<b>Name of work: -</b> Site survey, design, engineering, supply, installation, testing and commissioning of 475 kWp solar PV project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance of the system for a period of 25 years under RESCO model after operational acceptance.
<b>Earnest Money Deposit to be submitted</b>	<b>₹ 5,22,500 /-</b>
<b>Period of contract</b>	<b>25 Years</b>
<b>Performance Security</b>	<b>₹ 13,06,250 /-</b>

Tender Documents may be downloaded from Central Public Procurement Portal <http://eprocure.gov.in/eprocure/app>

Aspiring Bidders who have not enrolled/registered in e-procurement should enroll/register before participating through the website <http://eprocure.gov.in/eprocure/app>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission.'

Bidders can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, click on "GO" button to view all IIT BHILAI tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <http://eprocure.gov.in/eprocure/app> as per the schedule given in the next page.

No manual bids will be accepted. All quotation (both Technical and Financial) should be submitted in the e - procurement portal.



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Schedule

Name of Organization	Indian Institute of Technology Bhilai
Tender Type(Open/Limited/EOI/Auction/Single)	Open
Tender Category(Services/Goods/works)	Works
Type/Form of Contract (Work/Supply/Auction/Service/ Buy/ Empanelment/Sell)	Works
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems/Air conditioning)	Electrical Works
Source of Fund(Institute/Project)	Institute
Date of issue/Publishing	20/06/2023 (11:00 HRS)
Date of Pre-bid/queries by bidders	27/06/2023 (11:00 HRS)
Date of issue of corrigendum/clarifications (after the receipt of queries)	30/06/2023 (11:00 HRS)
Document Download Start Date	20/06/2023 (11:00 HRS)
Document Download End Date	04/07/2023 (17:00 HRS)
Last Date and Time for Uploading of Bids	04/07/2023 (before 17:00 HRS)
Date and Time of Opening of Technical Bids	05/07/2023
Tender fee	Rs 500 /- (Five hundred only) Through SBI i-collect Link <a href="https://www.onlinesbi.com/sbicollect/icollecthome.htm?corpID=646425">https://www.onlinesbi.com/sbicollect/icollecthome.htm?corpID=646425</a> Step1. Click Check Box to proceed for payment. Step2. Select Estate Tender Fee/EMD. Step3. Fill all Details and Submit (This online payment receipt may be provided in the on- line quotation/bid.)
EMD	Rs 5,50,000 /- (Five Lac Fifty-Five Thousand Rupees Only) in favour of Director IIT BHILAI.
Bid Validity days(180/120/90/60/30)	90 days (From last date of opening of tender)
Address for Communication	Health Center, Indian Institute of Technology Bhilai Near PHC, Jevra Sirsa, Kutelabhata, Durg , CG – (491001)
Contact No.	9873050675
Email Address	srinivasm@iitbhilai.ac.in



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## DETAILS AND ONLINE INSTRUCTIONS

### **For Online Bid Submission:**

As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)). The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal. More information useful for submitting online bids on the CPP Portal may be obtained at: <http://eprocure.gov.in/eprocure/app>

### **Registration:**

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)) by clicking on the link “Click here to Enroll”. Enrolment on the CPP Portal is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their userID / password and the password of the DSC / eToken.

### **Searching for tender documents:**

- 1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published.



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- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

### **Preparation of bids:**

- 1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- 2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents must be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- 3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black and white option.
- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

### **Submission of bids:**

- 1) The bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 2) The bidder has to digitally sign and upload the required bid documents as indicated in the tender document.
- 3) The bidder must select the payment option as "on-line" to pay the tender fee / EMD as applicable and enter details of the instrument. Whenever EMD / Tender fees is sought, bidders need to pay the tender fee and EMD separately on-line through SBI- I collect mode. (Refer to Schedule, Page No.2). The EMD in any other mode will not be accepted.





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- 4) A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 5) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 6) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done.
- 7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 8) Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other details.
- 9) Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

### **Assistance to bidders:**

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
- 2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 7315.

### **General Instructions to the Bidders:**

- 1) The tenders will be received online through portal <http://eprocure.gov.in/eprocure/app>. In the Technical Bids, the bidders are required to upload all the documents in .pdf format.



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- 2) Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through <https://eprocure.gov.in/eprocure/app>. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site <https://eprocure.gov.in/eprocure/app>.

Tenderer are advised to follow the instructions provided in the 'Instructions to the Tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e Procurement at <https://eprocure.gov.in/eprocure/app>.

## **CRITERIA FOR ELIGIBILITY OF BIDDERS**

- 1) Bidder should submit the copy of proof towards payment of tender fees – ₹ 500 /- and **Earnest money deposit of ₹ 5,22,500 /-**
- 2) Minimum 5 (five) years of experience in design, engineering, supply, , installation, testing and commissioning of solar PV project.
- 3) Firms/ Contractors must have completed and successfully operated at least for 24 Months after commissioning a Solar PV Plant in RESCO model at the designed efficiency of the following capacities:
  - a) One completed work of 380 kWp and is successfully running since last 24 months.

**OR**

- b) Two completed works of 285 kWp and are successfully running since last 24 months.

**OR**

- c) Three completed works of 190 kWp and are successfully running since last 24 months.

**“Similar works here refer to design, engineering, supply, installation, testing and commissioning of solar PV project completed by the bidder in last 7 (seven) years ending previous day of last date of submission of bid. Ongoing/Abandoned/Incomplete works shall not be counted.”**

- 4) Self-declaration on firm's letter head that they haven't been debarred or blacklisted for any services, works, supplies or products dealing in by any organization and no criminal case/ legal proceedings or industrial dispute is being pending or contemplated against them during the last 7 years.
- 5) The bidder should have average annual financial turn over (gross) of ₹ 78,37,500 /- in solar PV works during the last three Consecutive years ending 31st March 2022, balance sheets (may range from six to



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eighteen months) should be duly audited by Chartered Accountant. The year in which no turnover is shown would also be considered for working out the average. (Scanned copy of Certificate from Chartered Accountant to be uploaded)

- 6) The bidder shall submit the proof of financial capacity (Either self-reliant or a comfort letter for funding from any financial institution) for completion of the project.
- 7) Attested copy of registration certificates to be submitted. Registration of firms/ Contractors must be valid on the last day of issue of Tenders or extended date of issue of Tenders.
- 8) The agency 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.
- 9) The Engineer In-charge reserves the right to withdraw/ relax the above-mentioned eligibility criteria and in such a situation bidder will be given sufficient time to take the changes into account. However, no relaxation will be given as far as statutory requirements are concerned.
- 10) Bidder shall submit the CV/ Portfolio of the key personnel who will be deputed on the site for the installation, testing and commissioning of the project. The bidder shall also provide the CV/portfolio of the personnel who will be deputed on the site for operation and maintenance (minimum 2) of the entire system.

## **Important Note:**

- 1) Bidders must submit documentary proof in support of meeting each of the above minimum eligibility criteria. A simple undertaking by the bidder for any of the stated criteria will not suffice the purpose. All documentary proof must be listed and numbered on the letter head of the company and submitted with the technical bid.
- 2) In e-tendering intending bidder can quote his rates in figures only. The rates in words, amount of each item and total is generated automatically. Therefore, the rate quoted by the bidder in figures is to be taken as correct.
- 3) The bid submitted shall become invalid if the bidder is found ineligible. 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 tenderer in the office of tender opening authority.



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- 4) Even though the tenderers meet the above qualifying criteria, they are subjected to be disqualified if they have:
- 4.1) Made misleading or false representations in the forms, statements, and attachments submitted in proof of the qualification requirements; and/ or
  - 4.2) Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history or financial failures, etc.

## **Evaluation of Bids:**

The evaluation of bids shall be divided in two sections:

- 1) The Technical evaluation which shall be done as per the Annexure 15 of the NIT. The evaluation will be done by duly constituted committee of IIT Bhilai.
- 2) The Financial Evaluation will be done only for those bidders who qualify for the technical bid and secure 70% marks in the technical bid.



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***SECTION – II: TERMS AND CONDITIONS***

**GENERAL CONDITIONS OF CONTRACT:**

**PART – A (TERMS AND CONDITIONS)**

- 1) The intending bidder must read the terms and conditions of the tender carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
- 2) Information and instructions for bidders posted on website shall form the part of the bid document.
- 3) Interested bidders are required to submit their bids in a serially numbered & bounded manner.
- 4) Interested bidders are advised to inspect and examine the site and its surroundings and satisfy themselves (before submitting their bids), 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.
- 5) A bidder shall be deemed to have full knowledge of the site(s) 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, facilities for workers and all other services required unless otherwise specifically provided for in the contract documents.
- 6) Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.
- 7) The Engineer In-charge does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidder shall be summarily rejected.
- 8) Canvassing, whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable to rejection.
- 9) The Engineer In-charge reserves himself/herself the right of accepting the whole or any part of the bid and the bidder shall be bound to perform the same at the rate quoted.



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- 10) In case any discrepancy is noticed between the documents as uploaded at the time of submission of the bid online, then the bid submitted shall become invalid. The bid for the services shall remain open for acceptance for a period of **ninety (90) days** from the date of opening of financial bids, if any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the IIT Bhilai shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidder shall not be allowed to participate in the re-bidding process of the services.
  - 11) This notice inviting bid shall form a part of the contract document. The successful bidder, on acceptance of his bid by the Accepting Authority shall within 07 days from the stipulated date of start of the work, sign the contract consisting of the Notice Inviting Bid, all the documents including additional conditions, specifications, and schedules, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

## **PART – B (DELIVERY OF SOLAR POWER)**

- 1) Institute will purchase one hundred percent (100%) of the Solar Power generated by the solar roof-top system at the delivery point during each relevant month. If Institute is unable to take 100% of the electricity generated, then Deemed Generation will apply as per the standard procedure at mutually agreeable conditions. Deemed generation is not applicable if 100% or part of the rooftop solar system is at faulty or not working.
- 2) Moreover, Deemed Generation shall also be applicable:
  - a) If any part of the capacity of the Solar Power Plant is unable to operate at full capacity due to non-availability of load, subjected to furnishing of documentary evidence in support of the same;  
or
  - b) In the event contractor is generating power more than the available load, and the Buying Entity is not able to export or record the excess units generated due to faults in the equipment of Buying Entity. e.g., Net meter Cables, Equipments etc., which may stop the feeding/record of the Solar Power generated.
- 3) The payment terms shall strictly adhere to the Power Purchase Agreement made between Institute and the Contractor and will include the following terms:



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- 3.1) Institute will pay to the Solar Power Producer on monthly basis for the Solar Power generated by the system during the month. The Power producer (Contractor) shall invoice Institute on monthly basis on a particular date of each month after commencing the commercial operation. The date of billing shall be a part of power purchase agreement.
  - 3.2) The invoice to Institute shall include the following:
    - 3.2.1) The Solar power calculations for the relevant billing period.
    - 3.2.2) Supporting data, documents, and calculations in accordance with the PPA.
  - 3.3) In case 100% or part of the rooftop solar system is faulty, the power producer (Contractor) must pay Institute for the deemed generation as per the prevailing tariff of CSPDCL.
  - 4) The contractor and Institute shall enter the purchase value of the system over a period of 25 years in the PPA. This may be applicable in case IIT Bhilai wishes to own the project before the tenure of the PPA.
    - 4.1) The price reference shall be taken for calculating the total cost of the system as per the CERC (Central Electricity Regulatory Commission) guidelines for arriving at the system cost on a year-on-year depreciation basis for total PPA tenure of 25 years.
  - 5) The following are the General Authorities involved in the project:
    - 5.1) Officer inviting tender: Assistant Executive Engineer (E), (Estate), IIT Bhilai.
    - 5.2) Engineer In-Charge: Assistant Executive Engineer (E), (Estate), IIT Bhilai.
  - 6) The extension of time, rescheduling of milestones and delay in the start of work in case of delay of handing over of site will be decided solely by the Engineer In-charge.
  - 7) The Contractor shall complete the project identification, site Survey, design, engineering, supply, civil works, installation, testing and commissioning of entire project within 4 months from the date of issue of LoA.
  - 8) In case of any breakdown, the reason for the breakdown must be intimated to the Institute within 2 hours and the situation should be rectified within 4 hours in case of no change/replacement of parts is involved. In case, if there is any requirement of change of the part, the complaint shall be attended within 48 hours. If the complaint is not attended within the given timeframe, the Institute shall levy a penalty of 1 % of Performance Security for each day subjected to maximum of 7 days.



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- 9) In case of any further delay, the Institute shall get the system repaired at its own expenditure and 1.5 times of the repair cost shall be charged from the contractor.
- 10) If the contractor fails to commission the allocated capacity within 4 months from date of issue of LoA, the liquidated damage as per day per kWp basis for the delayed period would be levied from the Performance Security up to a period of 4 months from the SCD (Schedule Commissioning date) as per the following example:
- a) Total Capacity to be commissioned = 475 kWp.
  - b) Amount of performance security = Rs. 13,75,000
  - c) Performance Security per kWp per day for 6 months =  $13,75,000/475/180 = \text{Rs. } 16.08$  per kWp per day.
  - d) Capacity not commissioned = 200 kWp
  - e) Total delay = 20 days
  - f) Total LD =  $200 \text{ kWp} \times 20 \text{ days} \times \text{Rs. } 16.08 / \text{kWp/day} = \text{Rs. } 64,320 /-$

After the expiry of 6 months from SCD allocated capacity will get cancelled and 100% of Performance Security will be forfeited excluding for the completed capacity on a proportionate basis.

After completion of 25 years from the date of commercial operation, the entire plant/assets of 475 kWp Roof Top Solar PV System to be transferred to the Institute free of cost with the system fully functional at the guaranteed efficiency.





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## ***SECTION-III: SCOPE OF WORK***

### **Details of Scope of Work:**

- 1) The solar panels used in the Solar PV System shall be non-reflective type, preferably bifacial.
- 2) Institute will only provide the space on each building with RCC grid structure at a certain specified height (defined in drawings). List of drawings is mentioned in the Annexure-16. Further any additional structures, beams, foundations for solar structure, foundation bolts etc. is in the scope of the contractor.
- 3) The contractor may please note that the load bearing capacity of terrace slab is limited to 300 kg/m<sup>2</sup> and shall plan the fabrication of structure accordingly. The contractor shall take into confidence and obtain a permission/clearance in writing from CPWD/IIT Bhilai for construction or fabrication of any additional structure on the terrace. IIT Bhilai through their respective consultant shall grant the permission.
- 4) The proposed rooftop solar plant capacity of 475 kWp to be synchronized with the LT at grid at 430 V level of the same existing power distribution level and shall work on approval at 33 kV level. All necessary statutory approvals, registration at Chhattisgarh State Renewable Development Agency (CREDA), and coordination with CSPDCL for obtaining Net Metering is under the scope of the contractor. However, Institute shall support the agency in facilitating the documentation process if any.
- 5) The Project should be designed for interconnection with the grid in accordance with prevailing CERC/CSERC/CSPDCL regulations in this regard. For interconnection with the grid and metering, the contractor shall abide by applicable Grid Code, Grid Connectivity Standards, Regulations on Communication System for transmission of electricity and other regulations/procedures (as amended from time to time) issued by Appropriate Commissions and Central Electricity Authority (CEA), and any other regulations of the CSPDCL. Minimum voltage level for interconnection with the grid shall be as determined by the CSPDCL.
- 6) The contractor shall ensure proper synchronization with the respective LT DG sets, LT panels and their integration with the Campus Management System on defined protocol by the Institute for effective operational and plant efficiency monitoring along with timely data logging. The Institute shall be able to do diagnostics & monitor all plant efficiency-related parameters. *Defined protocol here refers to the BACNet communication protocol unless otherwise specified or changed at later stage.*
- 7) Institute will provide the rooftop space for the duration of the contract period without any charge. Respective terrace drawings shall be referred based on which the contractor shall submit the shop drawings for the design-drawing, for getting approved from the Institute before starting the



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execution. Institute shall approve the shop drawings in 15 days' time. In case Institute suggests some changes, the contractor shall be obliged to make such changes. The timeframe for making the changes in the drawing shall be restricted to 7 days. This period of getting approval of the shop drawings shall be deemed to have been included in the total period of commissioning of project.

- 8) The final revision of the shop drawings shall be submitted to the Institute in 2 set of hard copies and should also be uploaded to the Design Document and Management System (DDMS) portal of Institute. The methodology to upload the drawings on DDMS portal will be provided to the selected bidder at the time of submission.
- 9) The responsibility of getting connectivity and necessary approvals for grid connection and net-metering shall entirely be with the contractor and shall be at the risk and cost of the contractor. The transmission of power up to and including at the point(s) of interconnection where metering is done for energy accounting, shall be the responsibility of the contractor at its own cost. The maintenance of transmission system up to and including at the Interconnection Point shall be responsibility of the contractor, to be undertaken entirely at its risk and cost.
- 10) Metering arrangement of each Project shall have to be adhered to in line with relevant clauses of the PPA. The entire cost of transmission (if applicable) including cost of construction of line, wheeling charges, SLDC/Scheduling charges, SOC, MOC, maintenance, losses etc. and any other charges from the Project up to and including at the Interconnection Point will be borne by the contractor. An interface meter shall be installed for the recording of consumed energy at a single point so that net consumption along with the net losses can be assessed.
- 11) Monthly billing will be done by the contractor for the number of units generated by the system as per the agreed tariff and billing mechanism in accordance with the Power Purchase Agreement.
- 12) The contractor shall bear whole Project costs such as cost of engineering, procurement, installation, commissioning, operation and subsequent up-gradation and maintenance of Solar PV System for twenty-five (25) years including all costs such as operation & maintenance cost, insurance premium, administrative, logistic cost etc.
- 13) All EPC work including the transportation of material and machinery to and from the Project Site will be the responsibility of the Contractor.
- 14) Contractor should be ISO certified in their capacity as a Solar developer and shall carry out all works under the Project up to the said ISO standards.



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- 15) The contractor shall bear all risks of loss and damage to any part of the Solar PV System due to conditions not on account of the Institute.
  - 16) The contractor shall be liable to guarantee a minimum number of units of electricity that it shall supply annually. The guarantee shall be 95% of output during the first 15 years and 85% of output for the next succeeding 10 years. If the guaranteed output is not achieved, the contractor should pay the per unit tariff/charges as per prevailing rates of DISCOMS.
  - 17) The contractor shall submit technical details like Annual Generation estimate, preliminary system design used along with the tentative bill of material such as panel, inverter make etc.
  - 18) All the external and additional required cabling from the rooftop till the existing electrical panel room will be in the scope of the contractor.
  - 19) The erection of the solar PV system shall be done without causing any damage to the existing structure. Any damage to the structure/waterproofing should be repaired, under direction from Institute/CPWD at the cost of the selected Contractor.
  - 20) The technical specifications for different types of modules mounting structures are part of this tender document. However, the best suitable option shall be worked out by the contractor as per the rooftop conditions and same shall be approved by the Engineer In-Charge of the Institute.
  - 21) Contractor to submit the drawings and technical data sheets/Technical Specifications of the solar PV, Invertors, AC Distribution Board, DC Distribution Board, and any other layouts for approval within 07 days from the data of LoA.

## **Technical Specifications:**

A Roof Top Solar (RTS) Photo Voltaic (PV) system shall consist of following equipment/components:

- 1) Solar Photo Voltaic (SPV) modules consisting of required number of mono-crystalline PV modules
- 2) Inverter/PCU
- 3) Module Mounting structures
- 4) Array Junction Boxes
- 5) DC Distribution Box
- 6) AC Distribution Box



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- 7) Protections – Earthing, Lightning, Surge
  - 8) Energy Meter
  - 9) Cables
  - 10) Drawings & Manual
  - 11) Tools & Spares
  - 12) Signage
  - 13) Fire Extinguishers
  - 14) Miscellaneous

## **Description of items:**

### **1) Solar PV modules:**

- 1.1) The PV modules used must qualify to the latest edition of IEC standards or equivalent BIS standards, i.e. IEC 61215/IS14286, IEC 61853-Part I/IS 16170-Part I, IEC 61730 Part-1 & Part 2 and IEC 62804 (PID). For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC61701/IS 61701.
- 1.2) The solar PV modules should have a positive power tolerance.
- 1.3) The peak-power point current of any supplied module string (series connected modules) shall not vary by  $\pm 1\%$  from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be.
- 1.4) The peak-power point voltage of any supplied module string (series connected modules) shall not vary by  $\pm 2\%$  from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be.
- 1.5) The temperature co-efficient of power of the PV module shall be equal to or better than - 0.45%/°C.
- 1.6) Solar PV modules having half cut Mono PERC cells of minimum capacity 475 Wp to be used.
- 1.7) The PV Module efficiency should be minimum 20%.



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- 1.8) All electrical parameters at STC have to be provided.
  - 1.9) The PV modules shall be equipped with IP 65 or better protection level junction box with required numbers of bypass diodes of appropriate rating and appropriately sized output power cable of symmetric length with MC4 or equivalent solar connectors. The IP level for protection may be chosen based on following conditions:
    - 1.9.1) An IP 65 rated enclosure is suitable for most outdoor enclosures that won't encounter extreme weather such as flooding.
    - 1.9.2) An IP 67 rated enclosure is suitable at locations which may encounter temporary submersion at depths of up to one meter.
    - 1.9.3) An IP 68 enclosure is recommended if there may exist situations of submergence for extended periods of time and at substantial depths.
  - 1.10) All PV modules should carry a performance guarantee of >90% during the first 10 years, and >80% during the next 15 years. Further, module shall have performance warranty of >97% during the first year of installation — degradation rate of the modules should be below 1% per annum.
  - 1.11) PV modules must be tested and approved by one of the NABL accredited and BIS approved test centers and the report for the same shall be submitted by the contractor.
  - 1.12) Modules deployed must use an RF identification tag laminated inside the glass. The following information must be mentioned in the RFID used on each module:
    - 1.12.1) Name of the manufacturer of the PV module
    - 1.12.2) Name of the manufacturer of Solar Cells.
    - 1.12.3) Month & year of the manufacture (separate for solar cells and modules)
    - 1.12.4) Country of origin (separately for solar cells and module)
    - 1.12.5) I-V curve for the module, Wattage,  $I_m$ ,  $V_m$  and FF for the module
    - 1.12.6) Unique Serial No and Model No of the module
    - 1.12.7) Date and year of obtaining IEC PV module qualification certificate.
    - 1.12.8) Name of the test lab issuing IEC certificate.



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- 1.12.8) Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO14001
- 1.12.9) Brand Name, if applicable.
- 1.13) Other details as per IS/IEC 61730-1 clause 11 should be provided at appropriate place. In addition to the above, the following information should also be provided:
- 1.13.1) The actual Power Output Pmax shall be mentioned on the label pasted on the back side of PV Module.
- 1.13.2) The Maximum system voltage for which the module is suitable to be provided on the back sheet of the module.
- 1.13.3) Polarity of terminals or leads (colour coding is permissible) on junction Box housing near cable entry or cable and connector.
- 1.14) Unique Serial No, Model No, Name of Manufacturer, Manufacturing year, Make in India logo and module wattage details should be displayed inside the laminated.

## 2) Inverter/PCU:

- 2.1) Inverters/PCU should comply with applicable IEC/equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683, IS 16221 (Part 2), IS 16169 and IEC 60068-2(1,2,14,30)/Equivalent BIS Std.
- 2.2) Maximum Power Point Tracker (MPPT) shall be integrated in the inverter/PCU to maximize energy drawn from the array. Charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS standard. The junction boxes/enclosures should be IP 65 or better (for outdoor)/ IP54 or better (indoor) and as per IEC 529 Specifications.
- 2.3) All inverters/PCUs shall be IEC 61000 compliant for electromagnetic compatibility, harmonics, Surge, etc.
- 2.4) The PCU/ inverter shall have overloading capacity of minimum 10%.
- 2.5) Typical technical features of the inverter shall be as follows:
- 2.5.1) Switching devices: IGBT/MOSFET
- 2.5.2) Control: Microprocessor/DSP



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- 2.5.3) Nominal AC output voltage and frequency: as per CEA/State regulations
  - 2.5.4) Output frequency: 50 Hz
  - 2.5.5) Grid Frequency Synchronization range: as per CEA/State Regulations
  - 2.5.6) Ambient temperature shall suffice with the typical weather conditions of Bhilai.
  - 2.5.7) Humidity shall be in tolerance with the weather conditions of IIT Bhilai.
  - 2.5.8) Protection of Enclosure: IP-54 (Minimum) for indoor and IP-65(Minimum) for outdoor.
  - 2.5.9) Grid Frequency Tolerance range: as per CEA/State regulations
  - 2.5.10) Grid Voltage tolerance: as per CEA/State Regulations
  - 2.5.11) No-load losses: Less than 1% of rated power
  - 2.5.12) Inverter efficiency (Min.): >93% (In case of 10 kW or above with in-built galvanic isolation) >97% (In case of 10 kW or above without inbuilt galvanic isolation)
  - 2.5.13) Inverter efficiency (minimum): > 90% (In case of less than 10 kW)
  - 2.5.14) THD < 3%
  - 2.5.15) PF > 0.9. The output power factor of the inverter should be suitable for all voltage ranges.
  - 2.5.16) The PV system shall not inject DC current greater than 0.5 % of the continuous maximum rated inverter output current, into the utility interface, when tested at 25%, 50%, 75% and 100% of rated output power.
- 2.6) The inverter should be able to source or sink reactive power, and should have internal protection arrangement against any sustain fault in feeder line and against the lightening on feeder.
  - 2.7) All the Inverters should contain the following clear and indelible marking label and warning label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:
    - 2.7.1) The name or trademark of the manufacturer or supplier.
    - 2.7.2) A model number, name, or other means to identify the equipment.



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- 2.7.3) A serial number, code or other marking allowing identification of manufacturing location and the manufacturing batch or date within a twelve-month time period.
- 2.7.4) Input voltage, type of voltage (a.c. or d.c.), frequency, and maximum continuous current for each input.
- 2.7.5) Output voltage, type of voltage (a.c. or d.c.), frequency, maximum continuous current, and for a.c. outputs, either the power or power factor for each output.
- 2.7.6) The Ingress Protection (IP) rating.
- 2.8) Marking shall be located adjacent to each fuse or fuse holder, or on the fuse holder, or in another location provided that it is obvious to which fuse the marking applies, giving the fuse current rating and voltage rating for fuses that may be changed at the installed site.
- 2.9) In case the consumer is having a 3- $\phi$  connection, 1- $\phi$ /3- $\phi$  inverter shall be provided by the vendor as per the consumer's requirement and regulations of the State.
- 2.10) Inverter/PCU shall be capable of complete automatic operation including wake-up synchronization & shutdown.
- 2.11) For CFA calculation, minimum of following two shall be considered:
- 2.11.1) Solar PV array capacity in kWp.
- 2.11.2) Inverter Capacity in kW.
- 2.12) Integration of PV Power with Grid & Grid Islanding:
- 2.12.1) The output power from SPV would be fed to the inverters/PCU which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization.
- 2.12.2) In the event of a power failure on the electric grid, it is required that any independent power producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the





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grid, (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided, if not available in inverter.

2.12.3) MCB/MCCB or a manual isolation switch, besides 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 by the utility personnel.

### 3) Module Mounting Structures:

- 3.1) Supply, installation, erection and acceptance of module mounting structure (MMS) with all necessary accessories, auxiliaries and spare part shall be in the scope of the work.
- 3.2) Module mounting structures can be made from three types of materials. They are Hot Dip Galvanized Iron, Aluminium and Hot Dip Galvanized Mild Steel (MS). However, MS will be preferred for raised structure.
- 3.3) MMS Steel shall be as per latest IS 2062:2011 and galvanization of the mounting structure shall be in compliance of latest IS 4759. MMS Aluminium shall be as per AA6063 T6. For Aluminium structures, necessary protection towards rusting need to be provided either by coating or anodization.
- 3.4) All bolts, nuts, fasteners shall be of stainless steel of grade SS 304 or hot dip galvanized, panel mounting clamps shall be of aluminium and must sustain the adverse climatic conditions. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts.
- 3.5) The module mounting structures should have angle of inclination as per the site conditions to take maximum insolation and complete shadow-free operation during generation hours. However, to accommodate more capacity the angle of inclination may be reduced until the plant meets the specified performance ratio requirements.
- 3.6) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5.



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- 3.7) The upper edge of the module must be covered with wind shield so as to avoid build air ingress below the module. Slight clearance must be provided on both edges (upper & lower) to allow air for cooling.
- 3.8) Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The Empanelled Agency shall be fully responsible for any damages to SPV System caused due to high wind velocity within guarantee period as per technical specification.
- 3.9) The structures shall be designed to allow easy replacement, repairing and cleaning of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. Necessary testing provision for MMS to be made available at site.
- 3.10) Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance.
- 3.11) The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
- 3.12) The Rooftop Structures maybe classified in three broad categories as follows:

### 3.12.1) Ballast Structure:

- a) The mounting structure must be Non-invasive ballast type and any sort of penetration of roof to be avoided.
- b) The minimum clearance of the structure from the roof level should be in between 70-150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
- c) The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made from M25 concrete mixture.

### 3.12.2) Tin shed:

- a) The structure design should be as per the slope of the tin shed.
- b) The inclination angle of structure can be done in two ways:



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- Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shed in Proper south direction
  - With same tilt angle based on the slope of tin shed to get the maximum output.
- c) The minimum clearance of the lowest point from the tin shade should be more than 100mm
- d) The base of structure should be connected on the Purlin of tin shed with the proper riveting.
- e) All structure member should be of minimum 2 mm thickness.

### 3.12.3) RCC Elevated structure:

#### A. Minimum Ground clearance (300 mm – 1000 mm)

- a) The structure shall be designed to allow easy replacement of any module and shall be in line with site requirements. The gap between modules should be a minimum of 30 mm.
- b) Base Plate – Base plate thickness of the Structure should be 5 mm for this segment. The minimum clearance of the lowest point from the tin shade should be more than 100 mm
- c) Column – Structure Column should be minimum 2 mm in Lip section /3 mm in C-Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section. All structure members should be of minimum 2 mm thickness.
- d) Rafter - Structure rafter should be minimum 2 mm in Lip section / 3 mm in C-Channel section. The minimum section should be 70 mm in Web side (y-axis) and 40 mm in flange side (x-axis).
- e) Purlin - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 60 mm in Web side and 40 mm in flange side in Lip section.
- f) Front/back bracing – The section for bracing part should be minimum 2 mm thickness



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- g) Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- h) For single portrait structure the minimum ground clearance should be 500 mm.

## **B. Medium Ground clearance (1000 mm – 2000 mm) ( for reference only)**

- a) Base Plate – Base plate thickness of the Structure should be Minimum 6 mm for this segment.
- b) Column – Structure Column should be minimum 2 mm in Lip section / 3 mm in C-Channel section. The minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section
- c) Rafter - Structure rafter should be minimum 2 mm in Lip section / 3 mm in C-Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
- d) Purlin - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
- e) Front/back bracing – The section for bracing part should be minimum 2 mm thickness.
- f) Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

## **C. Maximum Ground clearance (2000 mm – 3000 mm) ( for reference only)**

- a) Base Plate – Base plate thickness of the structure should be minimum 8 mm for this segment.
- b) Column – Structure Column thickness should be minimum 2.6 mm in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3 mm in C-Channel section.



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- c) Rafter - Structure rafter should be minimum 2 mm in Lip section / 3 mm in C-Channel section. The minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section.
  - d) Purlin - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section.
  - e) Front/back bracing – The section for bracing part should be minimum 3 mm thickness.
  - f) Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

## **D. Super Elevated Structure (More than 3000 mm) (for reference only)**

### D.1 Base structure

- a) Base Plate – Base plate thickness of the Structure should be 10 mm for this segment.
- b) Column – Structure Column minimum thickness should be minimum 2.9 mm in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
- c) Rafter - Structure Rafter minimum thickness should be minimum 2.9 mm in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
- d) Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4 mm L-angle with the help of minimum bolt diameter of 10 mm.

### D.2. Upper structure of super elevated structure –

- a) Base Plate – Base plate thickness of the Structure should be minimum 5 mm for this segment.



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- b) Column – Structure Column should be minimum 2 mm in Lip section / 3 mm in Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
  - c) Rafter - Structure rafter should be minimum 2 mm in Lip section / 3 mm in Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
  - d) Purlin - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 60 mm in Web side and 40 mm in flange side in Lip section.
  - e) Front/back bracing – The section for bracing part should be minimum 2 mm thickness.
  - f) Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D.3. If distance between two legs in X-Direction is more than 3 mm than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2 mm thick, and bar should be minimum 12Dia.

D.4. Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation.

D.5. Foundation – Foundation should be as per the roof condition; two types of foundation can be done- either penetrating the roof or without penetrating the roof.

- a) If penetration on the roof is allowed (based on the client requirement) then minimum 12 mm diameter anchor fasteners with minimum length 100 mm can be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.



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- b) If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12 mm diameter and length should be minimum 300 mm.

### 3.13) Material Standards:

- 3.13.1) Design of foundation for mounting the structure should be as per defined standards which clearly states the Load Bearing Capacity & other relevant parameters for foundation design (As per IS 6403 / 456 / 4091 / 875).
- 3.13.2) Grade of raw material to be used for mounting the structures so that it complies the defined wind loading conditions (As per IS 875 - III) should be referred as follows (IS 2062 – for angles and channels, IS 1079 – for sheet, IS 1161 & 1239 for round pipes, IS 4923 for rectangular and square hollow section)
- 3.13.3) Test reports for the raw material should be as per IS 1852 / 808 / 2062 / 1079 / 811.
- 3.13.4) In process inspection report as per approved drawing & tolerance should be as per IS 7215.
- 3.13.5) For ascertaining proper welding of structure part following should be referred:
- a) D.P. Test (Pin Hole / Crack) (IS 822)
  - b) Weld wire grade should be of grade (ER 70 S - 6)
- 3.13.6) For ascertaining hot dip galvanizing of fabricated structure following should be referred:
- a) Min coating required should be as per IS 4759 & EN 1461.
  - b) Testing of galvanized material
    - Pierce Test (IS 2633)
    - Mass of Zinc (IS 6745)
    - Adhesion Test (IS 2629)



# INDIAN INSTITUTE OF TECHNOLOGY BHILAI NEAR PHC JEVRA SIRSA, KUTELABHATA, BHILAI, DURG, C.G. - 491001

- CuSO<sub>4</sub> Test (IS 2633)
- Superior High-Grade Zinc Ingot should be of 99.999% purity (IS 209) (Preferably Hindustan Zinc Limited or Equivalent).

3.13.7) Foundation Hardware – If using foundation bolt in foundation then it should be as per IS 5624.

#### 4) Array Junction Boxes:

- 4.1) The junction boxes are to be provided in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands. 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.
- 4.2) Copper bus bars/terminal blocks housed in the junction box with suitable termination threads conforming to IP 65 or better standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry, Single /double compression cable glands should be provided.
- 4.3) Polyamide glands and MC4 Connectors may also be provided. The rating of the junction box shall be suitable with adequate safety factor to interconnect the Solar PV array.
- 4.4) Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.
- 4.5) Junction boxes shall be mounted on the MMS such that they are easily accessible and are protected from direct sunlight and harsh weather.

#### 5) DC Distribution Box (DCDB):

- 5.1) May not be required for small plants, if suitable arrangement is available in the inverter.
- 5.2) DC Distribution Box are to be provided to receive the DC output from the PV array field.
- 5.3) DCDBs shall be dust & vermin proof conform having IP 65 or better protection, as per site conditions.
- 5.4) The bus bars are made of EC grade copper of required size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the inverter along with necessary surge





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arrestors. MCB shall be used for currents up to 63 Amperes, and MCCB shall be used for currents greater than 63 Amperes.

## 6) AC Distribution Box (ACDB):

- 6.1) AC Distribution Panel Board (DPB) shall control the AC power from inverter, and should have necessary surge arrestors, if required. There is interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- 6.2) All switches and the circuit breakers, connectors should conform to IEC 60947:2019, part I, II and III/ IS 60947 part I, II and III.
- 6.3) The isolators, cabling work should be undertaken as part of the project.
- 6.4) All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air -insulated, cubical type suitable for operation on 1- $\phi$ /3- $\phi$ , 415 or 230 volts, 50 Hz (or voltage levels as per CEA/State regulations).
- 6.5) The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
- 6.6) All indoor panels will have protection of IP 54 or better, as per site conditions. All outdoor panels will have protection of IP 65 or better, as per site conditions.
- 6.7) Should conform to Indian Electricity Act and CEA safety regulations (till last amendment).
- 6.8) All the 415 or 230 volts (or voltage levels as per CEA/State regulations) AC devices / equipment like bus support insulators, circuit breakers, SPDs, Voltage Transformers (VTs) etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions.
  - 6.8.1) Variation in supply voltage: as per CEA/State regulations.
  - 6.8.2) Variation in supply frequency: as per CEA/State regulations
- 6.9) The inverter output shall have the necessary rated AC surge arrestors, if required and MCB/ MCCB. RCCB shall be used for successful operation of the PV system, if inverter does not have required earth fault/residual current protection.



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## 7) Energy Meters:

- 7.1) A Roof Top Solar (RTS) Photo Voltaic (PV) system shall consist of following energy meters:
  - 7.1.1) Net meter: To record import and export units.
  - 7.1.2) Generation meter: To keep record for total generation of the plant.
- 7.2) The installation of meters including CTs & PTs, wherever applicable, shall be carried out by the respective Discoms as per the terms, conditions and procedures laid down by the concerned SERCs/DISCOMs.

## 8) Protection:

The system should be provided with all necessary protections like earthing, Lightning, and Surge Protection, as described below:

### 8.1) Earthing Protection:

- 8.1.1) The earthing shall be done in accordance with latest Standards.
- 8.1.2) Each array structure of the PV yard, Low Tension (LT) power system, earthing grid for switchyard, all electrical equipment, inverter, all junction boxes, etc. shall be grounded properly as per IS 3043-2018.
- 8.1.3) Each array structure of the PV yard, Low Tension (LT) power system, earthing grid for switchyard, all electrical equipment, inverter, all junction boxes, etc. shall be grounded properly as per IS 3043-2018.
- 8.1.4) All metal casing/ shielding of the plant shall be thoroughly grounded in accordance with CEA Safety Regulation 2010. In addition, the lightning arrester/masts should also be earthed inside the array field.
- 8.1.5) Earth resistance should be as low as possible and shall never be higher than 5 ohms.
- 8.1.6) For 10 KW and above systems, separate three earth pits shall be provided for individual three earthing viz.: DC side earthing, AC side earthing and lightning arrester earthing.

### 8.2) Lightning Protection:

- 8.2.1) The SPV power plants shall be provided with lightning & over voltage protection, if required. The main aim in this protection shall be to reduce the overvoltage to a tolerable



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value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. Lightning arrestor shall not be installed on the mounting structure.

- 8.2.2) The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors (LAs). Lightning protection should be provided as per NFC17-102:2011/IEC 62305 standard.
- 8.2.3) The protection against induced high-voltages shall be provided by the use of Metal Oxide Varistors (MOVs)/Franklin Rod type LA/Early streamer type LA.
- 8.2.4) The current carrying cable from lightning arrestor to the earth pit should have sufficient current carrying capacity according to IEC 62305. According to standard, the minimum requirement for a lightning protection system designed for class of LPS III is a 6 mm<sup>2</sup> copper/ 16 mm<sup>2</sup> aluminum or GI strip bearing size 25\*3 mm thick). Separate pipe for running earth wires of Lightning Arrestor shall be used.

### 8.3) Surge Protection:

- 8.3.1) Internal surge protection, wherever required, shall be provided.
- 8.3.2) It will consist of three SPD type-II/MOV type surge arrestors connected from +ve and -ve terminals to earth.

### 9) Cables:

- 9.1) All cables should conform to latest edition of IEC/equivalent BIS Standards alongwith IEC 60227/IS 694, IEC 60502/IS 1554 standards.
- 9.2) Cables should be flexible and should have good resistance to heat, cold, water, oil, abrasion etc.
- 9.3) Armored cable should be used and overall PVC type 'A' pressure extruded insulation or XLPE insulation should be there for UV protection.
- 9.4) Cables should have Multi Strand, annealed high conductivity copper conductor on DC side and copper/FRLS type Aluminum conductor on AC side. For DC cabling, multicore cables shall not be used.
- 9.5) Cables should have an operating temperature range of -10°C to +80°C and voltage rating of 660/1000 V.



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- 9.6) Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop less than 2% (DC Cable losses).
  - 9.7) The size of each type of AC cable selected shall be based on minimum voltage drop. However, the maximum drop shall be limited to 2%.
  - 9.8) The electric cables for DC systems for rated voltage of 1475 V shall conform to BIS 17293:2020.
  - 9.9) All cable/wires are to be routed in a RPVC pipe/ GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable is easily identified.
  - 9.10) All cable trays including covers to be provided.
  - 9.11) Thermo-plastic clamps to be used to clamp the cables and conduits, at intervals not exceeding 50 cm. Size of neutral wire shall be equal to the size of phase wires, in a three-phase system.
  - 9.12) The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25 years.

## 10) Drawings and Manuals:

- 10.1) Operation & Maintenance manual/user manual, Engineering and Electrical Drawings shall be supplied along with the power plant.
- 10.2) The manual shall include complete system details such as array lay out, schematic of the system, inverter details, working principle etc.
- 10.3) The Manual should also include all the Dos & Don'ts of Power Plant along with Graphical Representation with indication of proper methodology for cleaning, Operation and Maintenance etc.
- 10.4) Step by step maintenance and troubleshooting procedures shall also be given in the manuals.

## 11) Tools and spares:

- 11.1) After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the contractor for maintenance purpose. List of tools and tackles to be supplied by the contractor for approval of specifications and make from Institute.



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11.2) 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 contract and Operation & Maintenance, which upon its use shall be replenished.

## 12) Signages:

12.1) Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. The text of the signage may be finalized in consultation with Institute.

## 13) Fire Extinguishers:

The firefighting system for the proposed power plant for fire protection shall be consisting of:

13.1) Portable fire extinguishers in the control room for fire caused by electrical short circuits.

13.2) Sand buckets in the control room.

13.3) The installation of Fire Extinguishers should be confirmed to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing PCUs as well as on the Roof or site where the PV arrays have been installed.

## 14) Miscellaneous:

14.1) Connectivity: The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the SERC regulation for Grid connectivity and norms of DISCOM and amended from time to time.

14.2) Safety measures: Electrical safety of the installation(s) including connectivity with the grid must be taken into account and all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA Safety Regulation 2010 etc. must be followed.

14.3) Shadow analysis: The shadow analysis report with the instrument such as Solar Pathfinder or professional shadow analysis software of each site should be provided and the consumer should be educated to install the system only in shadow free space. Lower performance of the system due to shadow effect shall be liable for penalty for lower performance.



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
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**Annexure 1:**

**FINANCIAL INFORMATION**

Name of the firm / contractor.....:

I. Financial Analysis-Details to be furnished duly supported by figures in balance sheet/ profit & loss account for the last five financial years duly certified and audited by the Chartered Accountants, as submitted by the applicant to the Income Tax Department (Copies to be attached).

*Fig. in Lakhs Rs.*

Sl. No	Particulars	Financial Year				
		2017-18	2018-19	2019-20	2020-21	2021-22
1.	Gross Annual turnover on construction works					
2.	Profit / Loss					

The bidder shall declare the financial arrangements for carrying out the proposed work.

SIGNATURE OF BIDDER(S)



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**Annexure 2:**

**<< Organization Letter Head >>**

**DECLARATION SHEET**

We, \_\_\_\_\_ hereby certify that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification.

This is certified that our organization has been authorized (*Copy attached*) by the OEM to participate in Tender. We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document. Moreover, OEM has agreed to support on regular basis with technology / product updates and extend support for the warranty.

The prices quoted in the financial bids are subsidized due to academic discount given to IIT BHILAI.

We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS OF THE Vendor/ Manufacturer / Agent
1 Phone	
2 Fax	
3 E-mail	
4 Contact Person Name	
5 Mobile Number	
6 GST Number	
7 PAN Number	
(In case of on-line payment of Tender Fees)	
8 UTR No. (For Tender Fee)/DD Detail (In case of on-line payment of EMD)	
9 UTR No. (For EMD)/DD Detail	
10.Bank details of bidder (Name of Bank)	
11.Bank Branch Address with Phone No.	
12.IFSC Code	
13.MICR code of Bank	
14.Bank Account No	
15. Type of Bank account	



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**Annexure 3:**

**DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS SUCCESSFULLY COMPLETED DURING  
THE LAST FIVE YEARS ENDING PREVIOUS DAY OF LAST DATE OF SUBMISSION OF TENDERS**

Sl. No.	Name of Work/Project & Location	Owners Complete address with tele.No with contact person	Value of Contract in Rs.	Duration of Contract			Details of Work including Major items of work Involved	Details of the work commissioned and period for which successfully operating after commissioning.	Ref. No. Date of letter of Intent & Completion certificate enclosed
				Commencement date	Scheduled Completion date	Actual Completion Date			
1	2	3	4	5	6	7	8	9	10

*Signature of Tenderer*

**Note:**

The project should be completed and the system in operational conditions only to be considered for technical evaluation.





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Annexure 4:

**PERFORMANCE REPORT OF WORKS REFERRED IN ANNEXURE 3**

1.		<b>Name of work / Project &amp; Location</b>	
2.		<b>Agreement No.</b>	
3.		<b>Tendered Capacity (in kWp)</b>	
4.		<b>Installed Capacity (in kWp)</b>	
5.		<b>Date of Start</b>	
6.		<b>Date of completion</b>	
	a)	<b>Stipulated Date of Completion (as mentioned in work order)</b>	
	b)	<b>Actual Date of Completion</b>	
7.		<b>Date of Commissioning</b>	
8.	a) b)	<b>Design Efficiency After 1 yr of operation- Output efficiency (in case one year of successful operation is completed after commissioning)</b>	
9.		<b>Amount of compensation levied for delayed, completion if any</b>	
	a)	<b>Whether case of levy of compensation for the delay has been decided or not</b>	Yes/No
	b)	<b>If decided, amount of compensation levied for delayed completion, if any</b>	
10.		<b>Amount of reduced rate items, if any</b>	
	a)	<b>Performance Report</b>	
	b)	<b>Quality of Work</b>	Outstanding/Very Good/Good/Poor
	c)	<b>Financial Soundness</b>	Outstanding/Very Good/Good/Poor
	d)	<b>Technical Proficiency</b>	Outstanding/Very Good/Good/Poor
	e)	<b>Resourcefulness</b>	Outstanding/Very Good/Good/Poor
	e)	<b>General behavior</b>	Outstanding/Very Good/Good/Poor
11.		<b>Remarks ( if any ):</b>	
		<b>Note: (TDS to be submitted in case of non-Governmental works were executed).</b>	



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**Annexure 5:**

**UNDERTAKING REGARDING NON-FILING OF GST RETURN**

To

The Engineer In-charge,

Estate office, First Floor, Health Center building,

Indian Institute of Technology Bhilai,

Near PHC, Jevra Sirsa,

Kutelabhata, Durg , CG – (491001)

**Name of Work:** Site survey, design, engineering, supply, , installation, testing and commissioning of 475 kWp solar pv project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance (O&M) of the system for a period of 25 years under RESCO model after operational acceptance.

Sir,

Having examined the details given in bid document for the above work, I/we hereby submit the following:

“I/we hereby certify that I/we have not filed any GST return”.

Seal of bidder:

**Date of submission:**



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
NEAR PHC JEVRA SIRSA, KUTELABHATA,  
BHILAI, DURG, C.G. - 491001**

**Annexure 6:**

**DECLARATION ABOUT SITE INSPECTION**

To

The Engineer In-charge,

Estate office, First Floor, Health Center building,

Indian Institute of Technology Bhilai,

Near PHC, Jevra Sirsa,

Kutelabhata, Durg , CG – (491001)

**Name of Work:** Site survey, design, engineering, supply, , installation, testing and commissioning of 475 kWp solar pv project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance (O&M) of the system for a period of 25 years under RESCO model after operational acceptance.

Dear Sir,

It is hereby declared, I/ We the bidder inspected and examined the subject site and its surroundings and satisfy myself/ourselves as to the forms and nature of the site. / ourselves before submitting the bid, the accommodation which may require and all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid have been obtained. I/We the bidder shall have full knowledge of the site and no extra charge consequent upon any misunderstanding or otherwise shall be claimed in later date.

I/We bidder shall be responsible for arranging and maintaining at 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 me/us implies that I / We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

Yours faithfully

(Duly authorized signatory of the bidder)



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
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BHILAI, DURG, C.G. - 491001**

**Annexure 7:**

**UNDERTAKING REGARDING GST REGISTRATION IN THE STATE OF CHHATTISGARH.**

To

The Engineer In-charge,  
Estate office, First Floor, Health Center building,  
Indian Institute of Technology Bhilai,  
Near PHC, Jevra Sirsa,  
Kutelabhata, Durg , CG – (491001)

**Name of Work:** Site survey, design, engineering, supply, , installation, testing and commissioning of 475 kWp solar pv project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance (O&M) of the system for a period of 25 years under RESCO model after operational acceptance.

Sir,

Having examined the details given bid document for the above work, I/we hereby submit the following:

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

Seal of bidder:

Date of submission:

Signature(s) of Bidder(s)



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Annexure 8:

**STRUCTURE & ORGANISATION**

1.	Name & Address of the bidder	
2.	Telephone No. /Email id /Telex No./Fax No.	
3.	Legal status of the bidder (Scan and Upload copies of original document defining the legal status).	
a)	An Individual	
b)	A proprietary firm	
c)	A firm in partnership	
d)	A limited company or Corporation	
4.	Particulars of registration with various Government bodies (Scan and Upload attested photo-copy).	
	<b>ORGANIZATION/PLACE OF REGISTRATION</b>	<b>REGISTRATION NO.</b>
a)		
b)		
c)		
5.	Names and Titles of Directors & Officers with a designation to be concerned with this work.	
6.	Designation of individuals authorized to act for the organization.	
7.	Has the bidder, or any constituent partner in case of partnership firm Limited company/ Joint Venture, ever been convicted by the court of law? If so, give details.	
9.	Any other information considered necessary but not included above.	

SIGNATURE OF THE BIDDER



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
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BHILAI, DURG, C.G. - 491001**

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**Annexure 9:**

**DETAILS OF PROPOSED APPROACH & METHODOLOGY**

Bidder shall furnish a detailed method statement (Technical Note) for carrying out of the works, along with a construction program. Preferably in MS project / Primavera showing sequence of operation and the time frame for various segments of temporary and permanent works. Signature (Authorised Signatory)

Signature

(Authorised Signatory)



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
NEAR PHC JEVRA SIRSA, KUTELABHATA,  
BHILAI, DURG, C.G. - 491001**

**Annexure 10:**

**INTEGRITY PACT**

To,

.....,

.....,

.....

Sub: NIT No.: 01/IITBhilai/ Estate/2023-24

**Name of Work:** Site survey, design, engineering, supply, , installation, testing and commissioning of 475 kWp solar pv project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance (O&M) of the system for a period of 25 years under RESCO model after operational acceptance.

Dear Sir,

It is here by declared that IIT Bhilai is committed to follow the principle of transparency, equity and competitiveness in public procurement. The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering 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 IIT Bhilai.

Yours faithfully



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
NEAR PHC JEVRA SIRSA, KUTELABHATA,  
BHILAI, DURG, C.G. - 491001**

**Annexure 11:**

**INTEGRITY AGREEMENT**

To,

The Engineer In-charge,

Estate Management Unit, IIT Bhilai,

Government Engineering College

Old Dhamtari Road

Sejbahar- (Raipur)

**Subject:** Submission of Tender for the work of Site survey, design, engineering, supply, installation, testing and commissioning of 475 kWp solar PV project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance of the system for a period of 25 years under RESCO model after operational acceptance.

Dear Sir,

I/We acknowledge that IIT Bhilai is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document. I/We agree that the Notice Inviting Tender (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 tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE making of the bid shall be regarded as 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 tender/bid is finally accepted by IIT Bhilai. 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 tender/bid, IIT Bhilai shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid in accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of IIT Bhilai.





**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
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BHILAI, DURG, C.G. - 491001**

**Annexure 12:**

**LETTER OF SUBMISSION- COVERING LETTER**

Tel:- .....

**Fax:** - .....

Email address:- .....

To,

The Engineer In-charge,

Estate Management Unit, IIT Bhilai,

Government Engineering College

Old Dhamtari Road

Sejbahar- (Raipur)

**Subject:** Site survey, design, engineering, supply, installation, testing and commissioning of 475 kWp solar PV project on the rooftop of various buildings of IIT Bhilai, including operation & maintenance of the system for a period of 25 years under RESCO model after operational acceptance.

Dear Sir,

We, the undersigned, ..... [*“insert name of the bidder”*] having read, examined and understood in detail the Tender Document for Design, Supply, Installation, Testing, Commissioning, Operation and Maintenance of Solar PV project on the rooftop of various academic buildings of IIT Bhilai, including Operation & Maintenance (O&M) of the system for a period of 25 years under RESCO Model after operational acceptance.” (the **“Tender Document”**) in India hereby submit our Proposal comprising of a General Qualification submission, technical proposal, and financial proposal (**“Price Bid”**). We confirm that neither we nor any of our Parent Company / Affiliate/Ultimate Parent Company has submitted a Bid other than this Bid directly or indirectly in response to the aforesaid Tender Document.

We give our unconditional acceptance to the tender dated.....and documents attached thereto, issued by IIT Bhilai, as may have been amended from time to time. As a token of our acceptance of the Tender Document, the same have been initialed by us and enclosed to the Bid. We shall ensure that we execute relevant Tender Documents as per the provisions of the Tender Document and the provisions of such Tender Document shall be binding on us.



**INDIAN INSTITUTE OF TECHNOLOGY BHILAI  
NEAR PHC JEVRA SIRSA, KUTELABHATA,  
BHILAI, DURG, C.G. - 491001**

**Annexure 13:**

**MODIFIED FORM FOR BANK GUARANTEE FOR PERFORMANCE GUARANTEE / SECURITY DEPOSIT /**

1. Whereas the Engineer In-charge, Estate Management Unit, IIT Bhilai, on behalf of IIT Bhilai (hereinafter called “The IIT Bhilai”) has invited bids under ..... (NIT Number) .....dated.....for (Name of work).....  
..... (hereinafter called “the contractor”) for compliance of his obligations in accordance with the terms and conditions of the said NIT.

\*\* or \*\*

Whereas the Engineer In-charge, Estate Management Unit ..... (name of Institute) ..... , on behalf of IIT Bhilai (hereinafter called “The Bhilai”) as entered into an agreement bearing number ..... With (name and address of the contractor) ..... (hereinafter called “the Contractor”) for execution of work ..... (name of work) ..... IIT Bhilai 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 IIT Bhilai an amount not exceeding Rs. .... (Rupees Only) on demand by the IIT Bhilai within 10 days of the demand.

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



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further undertake to pay the IIT Bhilai any money so demanded notwithstanding any dispute or dispute 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 valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

We, ..... (indicate the name of the Bank) , further

agree that the IIT Bhilai shall have the fullest liberty without our consent and without affecting 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 IIT Bhilai against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the IIT Bhilai or any indulgence by the IIT Bhilai 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.

5. We, ..... (indicate the name of the Bank) ,

further agree that the IIT Bhilai at its option shall be entitled to enforce this Guarantee against the Bank as a principal debater at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the IIT Bhilai may have in relation to the Contractor's liabilities.

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

7. We, ..... (indicate the name of the Bank) ,

undertake not to revoke this guarantee except with the consent of the IIT Bhilai in writing.

8. This Bank Guarantee shall be valid up to Unless extended on

demand by the IIT Bhilai. 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:



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1. Signature ..... Authorized signatory Name and address Name  
Designation

Staff Code no.

2. Signature ..... Bank Seal

Name and Address

Note:

1. \*Date to be worked out based on 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.

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

The Bank Guarantee shall be drawn on non-judicial stamp paper of minimum Rs.100



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**Annexure 14:**

**PRICE BID**

(To be submitted Online)

Each bidder shall provide, as a part of its financial proposal provide the flat tariff/ charges perunit for a period of twenty-five (25) years and the same shall be made part of the PPA.

Description	Tariff (in Rs./kWh)
Flat tariff/ charges per unit for a period of 25years	

**Certified that:**

- 1) Above rates are in accordance with the all the specifications, various terms, conditions and requirements mentioned in this tender document, to perform the work satisfactorily.
- 2) The rates are inclusive of all taxes and duties whatsoever.

**Note:**

- 1) The tariff/charges shall be calculated up to two decimal places.
- 2) Bids not in conformity with above provisions will be rejected.
- 3) If IIT Bhilai is not able to utilize or take-off power from roof top solar power system due power distribution issues, then deemed generation is applicable. Power producer to submit necessary calculations considering the solar irradiation.
- 4) Real time solar irradiation meter with historical trends to be installed at site. This will help in arriving the deemed generation.

Date:

Signature:

Designation:

Place:

(Company Stamp)



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Annexure 15:

**CRITERIA FOR THE TECHNICAL EVALUATION OF BIDDERS**

SN	Evaluation Parameter	Maximum Marks (Out of 50)	Evaluation Criteria
1.	Financial Strength	5 marks	1) 60% marks for minimum eligibility criteria 2) 100% marks for twice the minimum eligibility criteria or more. 3) In between (1) & (2)- on pro-rata basis
2.	Financial Closure	10 marks	4) 60% marks for minimum eligibility criteria 5) 100% marks for twice the minimum eligibility criteria or more. 6) In between (1) & (2)- on pro-rata basis
3.	Experience in similar class (Work of Design, Engineering, Installation, Testing and Commissioning of Solar PV Project and successfully operating for minimum period of 2 years.	20 marks	1) 60% marks for minimum eligibility criteria 2) 100% marks for twice the minimum eligibility criteria or more. 3) In between (1) & (2)- on pro-rata basis
4.	Performance report (performance of similar class of work as mentioned in S.N. (3) will be considered.	05 marks	Satisfactory – 2, Good – 3, Very Good – 4, Outstanding – 5.



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5.	Area utilized for the installation of solar panels.  (In this parameter, the area of solar panel used for per kW generation will be evaluated)	10 marks	<ol style="list-style-type: none"><li>1) 1 kW/ 6 m<sup>2</sup> = 10 marks</li><li>2) 1 kW/ 8 m<sup>2</sup> = 07 marks</li><li>3) In between (1) &amp; (2)- on pro-rata basis</li><li>4) No marks shall be awarded in case the area of generation per kW exceeds 8 m<sup>2</sup>.</li></ol>
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Annexure 16:

## List of Drawings:

### 1) DP - 1 Drawing (Academic Area)

- Access Corridor
- Engineering Department - 1
- Engineering Department - 2
- Science Department -1
- Science Department -2
- Central Prototyping Facility
- Central Instrumentation Facility
- Library and Data Center