INDIAN BANK,
ZONAL OFFICE TIRUPPUR

PART - 1

TECHNICAL BID

Tender document for "Design, Engineering, Supply, Installation, Testing and Commissioning of 17 kWp Grid Interactive Solar Photo Voltaic system" at Indian Bank Own Premises at Indian Bank - Tiruppur Main Branch, Tiruppur.

ISSUED TO

M/s._____

This document contains 67 pages

INDIAN BANK ZONAL OFFICE TIRUPPUR 641602

इंडियन बैंक
Indian Bank
Your Own Bank

ZONAL OFFFICE, TIRUPPUR

TENDER DOCUMENT

Name of work:

"Design, Engineering, Supply, Installation, Testing and Commissioning of 17 kWp Grid interactive Solar Photo Voltaic system" at Indian Bank - Tiruppur Main Branch, Tiruppur

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NOTICE INVITING TENDER (NIT)

Invitation of Tender for "Design, Engineering, Supply, Installation, Testing and Commissioning of 17 kWp Grid Interactive Solar Photo Voltaic system" at Indian Bank own premises at Indian Bank – Tiruppur Main Branch.

1) Indian Bank invites sealed tenders in 2- bid system [Technical (Part-1) and Financial bid (Part-2)] from the Contractors for their proposed work of Design, Engineering, Supply, Installation, Testing and Commissioning of Total Capacity 17 kWp Grid Interactive Solar Photo Voltaic system at various location of Indian Bank, own premises.

2) Tenders should be accompanied by an Earnest Money Deposit for an amount of **Rs. 25,500/- (Rupees Twenty Five thousand Five Hundred only**) in the form of D.D favoring "Indian Bank, Zonal Office, Tiruppur"/ Bank guarantee from any scheduled Bank in favour of Indian Bank Zonal Office,Tiruppur shall be *enclosed along with Technical Bid Documents.* Tender cost of **Rs 1000/- (Rupees One Thousand Only**) in the form of DD in favor of "Indian Bank, Zonal Office Tiruppur " should be submitted along with the Technical Bid (Cover-1). *Tenders submitted without EMD and Tender Cost in the "Technical Bid (Cover-I)" will be rejected.*

3) The tenders in **duplicate along with enclosures** should be submitted in two separate sealed covers each with the superscription giving the Name of the work. The EMD in the above form and the technical & price bid shall be enclosed in a cover superscripted with the name of the work and wording 'EMD + Technical bid' **(cover 1).**
The Price bid consisting of the Bill of Quantity shall be enclosed in another cover super scribed with the name of the work and the working 'Price Bid' **(Cover 2).**
Both the **covers 1 & 2** may be inserted in a third cover super scribed with the name of the work (**cover 3).**

4) Sealed tenders in the prescribed format shall be deposited in the tender box kept at Indian Bank Zonal Office Tiruppur on or before the stipulated date and time of submission of the tender, after noting down in the register meant for this in the Expenditure department. *The Price Bid not submitted in the prescribed format will be summarily rejected.*

5) At the time fixed for opening of the tender first, the cover 3 shall be opened and then cover containing the EMD and Technical bid will be opened. If the EMD submitted is in the acceptable form, then the Technical bid will be evaluated, if not the tender will be rejected. **The tender cost of Rs 1000/-(Rupees One Thousand Only)** in the form of a **demand draft** in favor of Indian Bank Zonal Office Tiruppur shall also be enclosed in cover-1.

6) **Salient Features of Contract**:

Estimated Cost of total Work	Rs. 12.75 Lakhs (Twelve Lakhs Seventy Five Thousand Only) (Excluding GST)
Earnest Money Deposit (EMD)	Rs. 25,500/- (Rupees Twenty Five Thousand Five Hundred only Refundable
Initial Security Deposit (S.D)	2% of the total contract value (shall be submitted within 7 days of receiving Work Order)
Retention Amount (RMD)	3% of each Bill Amount
Total Security Deposit (SD)	5% of the total contract price [Initial S.D (2%) + RMD (5%)]
Defects Liability Period (DLP)	**12** Months from the date of virtual completion
Date of Commencement (Clause 33 of the General Conditions of Contract)	**14 days** from the date of issue of Work Order/letter of intent or or Date of which the site is handed over whichever is later
Date of Completion	**30 days** from the Date of issue of Work Order/letter of intent

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	or Date of which the site is handed over whichever is later.
Liquidated Damages for Delay	1 % per week of the Contract Value for intermediate and final deadlines subject to maximum total of 10% of final Contract value
Frequency of Interim Certificate	Monthly
Minimum Value of work for the issue of Interim Certificates	Rs.3 lakhs (Three Lakhs Only)
Period of honoring certificate for interim payment against each running bill by Employer	30 days from the date of receipt of Bill payment recommendation received from Engineer-In-charge.
Period of honoring Final Certificate	Six weeks from the date of receipt of Bill payment recommendations from Engineer-In-charge.
Period of Performance uarantee for solar PV panels, inverters and connected system	Six years from the date of virtual completion. The Tenderer shall be required to deposit 5% of the Executed value of work as performance guarantee ***(format given in Appendix V)*** for a period of 6 years in the form of irrevocable bank guarantee of any scheduled bank in accordance with the form prescribed or fixed deposit receipt, wit days of the Virtual Completion.
Start of Issue of Tender (Down Loading from Bank's Website)	**03.09.2024** (down loading from Bank's Website: (http://www.indianbank.in/tender.php)
Last date and Time of Submission of tenders	**3.00PM on 23.09.2024**
Opening of Technical Bid	**4.00PM on 23.09.2024**
Opening of Price Bid	Will be informed later to the eligible bidders

7) Validity of Tender shall be **120 days** from the date of opening of tender.

8) The rates quoted by the Tenderer shall be based only on the specifications and conditions of the tender documents.

9) The Tenderers shall take care to price his tender rationally. Extreme under-pricing or overpricing in item-rates, total amount will be considered adversely in the assessment of tenders. The Tenderer shall on demand submit analysis of rates of some items of work if so required by the Employer. Employer reserve the right to reject extremely under priced bid and also reserve the right to reject the bids with irrational, substandard, under priced values for accessories, panels, inverters and not accordance with the specified material in the tender document.

10) The Employer is not bound to accept the lowest tender and reserves the right to accept or reject any or all tenders, either in whole or in part, without assigning any reason for doing so.

11) The Tenderers are advised to inspect the site before quoting for the job. The site will be available for inspection **from 03.09.2024 to 23.09.2024 during office hours (i.e 10:00AM to 5:00PM). Hence, the Tenderers are advised to inspect the site in this regard before quoting for the job.**

12) The Employer is not liable for the cost incurred in the inspection and preparation of tender and submission / participation and also not liable for any other cost what so ever may be.

13)The Companies who are registered with Micro, Small & Medium Enterprises and those having valid NSIC certificate under Government Store Purchase Programme having certificate clearly indicating the amount of "Quantitative Capacity Per Annum" are exempted from the submission of Tender document fee/EMD on submission of requisite proof in the form of valid certification from MSME and NSIC.

Yours faithfully,
For Indian Bank

Zonal Manager

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ELIGIBILITY CRITERIA

1. The Tenderer should either be a reputed manufacturer or contractor / system integrator or Government of India recognised Startup who can implement solar rooftop plants with panels manufactured by MNRE approved manufacturers.

2. **EXPERIENCE:**

   The Tenderer should have executed similar jobs for the past 5 years in market ending on 31.03.2024

S.No	Eligible Work	Value–Rs. in Lakhs
1	**Three** similar completed works each costing not less than	6
2	**Two** similar completed works each costing not less than	9
3	**One** similar completed work each costing not less than	11

   Similar works shall mean "Design, Engineering, Supply, Installation, Testing and Commissioning of Solar Power Project of capacity not less than 17 kWp – per project". Startups with Valid Startup Recognition /DPIIT Certificate issued by Government of India are exempted from the above experience requirements.

3. **TURNOVER:**

   Average annual turnover from the works for the last three years ending 31st March 2024 should not be less than **Rs. 11 Lakhs** as per the audited balance sheet. (If audited balance sheet for the FY 2023-24 is not available, then the Audited Balance sheet for FY 2022-23 shall be enclosed.)

4. **PROFIT/LOSS:-**

   Tenderer should be a Net Profit making firm and should nothave made losses in the last three financial years out of past 5 years. Certificate(s) from Chartered Accountant / Statutory auditors specifying the net worth of the Applicants, as at the close of the preceding financial year.

5. **Solvency Certificate:**

   The bidders should produce a solvency certificate obtained on or after 01.04.2022 for an amount equal to Rs.6 Lakhs or more from the Tahasildar /Nationalized/ Scheduled Bank .Annual Turnover certificate issued by a Chartered Accountant along with the bid.

6. The panel manufacturer shall be in the approved list of MNRE.

7. The Contractor should have valid '**A**' Electrical license issued by the Tamilnadu Electrical inspectorate and Prior experience in executing power infrastructure, utility projects to carry out the works in Bank's Premises (HT / LT),The copies of all this have to be sumitted in the Cover 1.

8. Contractor should have good contacts with respective Electricity Board, CEA and other connected Government agencies / State Nodal Agencies for liaisoning.

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TENDER DECLARATION

I/We have read and examined the notice inviting tender, Schedules, applicable specifications,- drawings, Conditions of contract and other documents and rules referred to in the conditions of contract and all other contents in the tender documents for the work.

I/We hereby submit tender for the execution of the work specified for Indian Bank, within the time frame specified in the tender and in accordance in all respects
with the specifications, designs, drawings and instructions in writing referred to in General conditions of contract.

I/We agree to keep the tender open for 120 days from the due date of opening thereof and not to make any modifications in its terms and conditions.

A sum of **Rs 25,500/-** (Rupees Twenty-Five Thousand Five Hundred Only) is enclosed in the form of demand draft / Bank Guarantee towards EMD and Rs 1000/- (Rupees One Thousand Only) towards tender cost.

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

Dated:

Authorized Signatory of the Tenderer
Designation:

Witness Signature

Name:

Postal Address:

Occupation.

SPECIAL CONDITIONS OF CONTRACT

1. Scope of Work:

The scope of work for the purpose of this tender constitutes "Design, Engineering, Supply, Installation, Testing and Commissioning of 17 kWp Grid interactive Solar Photo Voltaic system" at Indian Bank, own premises at Tiruppur Main Branch.

2. Price Basis:

a. The unit rates mentioned in schedule of rates shall remain firm and shall not be subjected to any escalation throughout the currency of the contract.

b. The quoted rates shall be inclusive of supply of all materials required for completing the item works.

c. Payment shall be made on the actual quantum of work executed, duly certified by Bank / Engineer-In-charge/ Engineer-In-charge.

d. The rates quoted shall be **excluding GST** applicable on the date of LOI. Any statutory variations thereto and/or new levies due to an act or enactment, after the date, shall be to the Owner's account against documentary evidence within the contractual completion date. Any such variation/imposition of new taxes and levies beyond the contractual completion date shall be to the contractor's account.

e. The quoted prices shall be **excluding GST.** Owner / Bank / Engineer-In-charge shall not be liable to any liability of the Contractor on this account. Contractor shall periodically produce documentary proof for having fulfilled the above obligations in time, including proof of payment, proof of filing of returns, etc. failing which Owner / Bank / Engineer-In-charge reserve the right to take appropriate action at the cost and consequence of the Contractor.

f. Income Tax, at applicable rates, shall be deducted from the Contractor's Bills, as per Income Tax Act and TDS Certificate issued thereof.

3. Terms of Payment:

Progress Payment:

70% of cost of material on completion of delivery of same to the site of installation covered under the order and on submission of invoice, duly certified and verified by our Engineer in-charge / Consultant / Bank.

Balance 25 % shall be released on submission of successful completion of installation, testing and commissioning, submission of all final technical documents in the required number of sets and as also on statutory approval from relevant statutory Authorities & submission of invoice duly certified by Bank / Engineer-In-charge / Consultant.

Balance 5% of retention amount will be retained from each bill and will be released after the defects liability period of 1 year. For MSME registered firms, the norms on the release of Retention Money is described in the Page 33, Clause 46, of General Conditions of Contract.

The Owner / Bank / Engineer-In-charge will entertain only one running bill per month and for a minimum gross amount of **Rs. 3,00,000.00 (Rupees Three Lakhs Only).**

Owner may withhold payment on account of any defect/deficiency in the work already executed and payment released, based on subsequently discovered evidence, failure to make payments to Sub-Contractors, damage caused by the Contractor to Owner's property, properties of other agencies within the premises, unfulfilled statutory obligations, etc.

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4. Effective date, Time schedule and Liquidated damages for delay:

a. The date of Letter of Intent issued by Indian Bank shall be deemed as the "Effective Date" of contract.

b. The entire work covered under the contract shall be completed in all respects within **30 days** from the Effective Date.

c. Time is the essence of this project and hence completion schedule of **30 days** should be strictly adhered to.

d. However, at the option of the OWNER, such delayed completion may be accepted subject to levy of liquidated damages @ 1.00% of the final contract value per week of delay or part thereof, subject to a maximum of 10.00% of the final contract value.

The effective date shall be reckoned from 14 days from the date of issue of Work Order/letter of intent or date of which the site is handed over whichever is later.

5. Measurement:

The Quantities set out in the schedule of items and rates are estimated quantities of work. The final quantities of work executed by the Contractor in fulfilment of his obligations under the contract shall be jointly measured by the Contractor and the Owner / Engineer-In-charge. The Owner / Bank / Engineer-In-charge will be final authority for the measurement relating to bills.

6. Responsibility:

Owner / Bank / Engineer-In-charge reserve the right to inspect the Solar PV system Equipments at the Contractor's Works as per the technical specifications and the equipment shall be dispatched only after receipt of a Release Order issued by the Bank / Engineer-In-charge/ Engineer-In-charge.

Unless otherwise specified in the contract / Work order / Purchase Order, the completion of work shall not be deemed to have been achieved until all the works required to be carried out under the contract have been completed to the entire satisfaction of the Bank / Engineer-In-charge/ Engineer-In-charge, in all respects and virtual Completion Certificate is issued.

It is the responsibility of the contractor to obtain all statutory approval from the Electrical Inspector/ government departments etc. and hand them over to the owner through the Engineer-In-charge.

7. Progress Report:

The Contractor shall submit to the Owner / Bank / Engineer-In-charge once in two weeks progress report for the previous period showing up-to-date cumulative progress and progress during the preceding period alone on all progress items of each section or portion of the works in the proforma prescribed by the Owner / Engineer-In-charge.

8. Contractor's Engineer:

The Contractor shall keep qualified and experienced Engineer(s) for full time during execution of work for entire Contract period.

9. Equipment:

The Contractor shall make his own arrangement to procure all constructional plant and equipment for his work. He shall also submit with the tender, the type and number of different Equipments with their capacities in good working conditions, which he will use on the site to ensure smooth completion of the work in specified time. All materials, construction plant and equipment etc., once brought by the CONTRACTOR on the site are not to be removed from there without the written approval from the Owner / Engineer-In-charge.

10. Extra Items:

Extra items, if any, shall be paid on the basis of analysis of rate of cost of materials and labour produced by CONTRACTOR, and the item-rates agreed upon with the Owner / Engineer-In-charge.

The execution of extra item is compulsory in order to complete the project work. In case the Contractor fails to execute extra item, Owner / Bank / Engineer-In-charge will have the right to execute these items through other agency / agencies at the risk and cost of the Contractor.

While arriving at the agreed rate of extra items, the Plant & Machinery / Overheads / profit shall be considered to the tune of 15% of cost of materials and labour.

Owner / Bank / Engineer-In-charge reserves the right to verify the price of material through market survey.

11. Guarantees / Liabilities:

The Installation including all components and accessories **shall be guaranteed for a period of 60 months after one year from the date of Virtual Completion of the same against defective material** (including Manufacturer's guarantee for equipments etc.), shortfall in performance and faulty workmanship. The contractor shall immediately make free replacement of any of the parts or components that might go out of order within this period and Indian Bank / Engineer-In-charge's decision in this regard will be final and binding on the contractor. The work shall be carried out in a workmanlike manner.

12. Shut down work:

The work has also to be carried out on bank holidays since there is need to take shut down of 415V electrical system for working inside the panels. At least one week before notice to be given for arranging such electrical shut downs which will not affect the power supply to continuously energized equipments like UPS units, air conditioning units in server room, UPS room etc.

13. INSURANCE

Contractor shall obtain and maintain any and all necessary insurance cover for the entire work that may be required under any law or regulations applicable, including but not limited to the following:

- Contractor's All Risk Policy, for Contractor's Scope of Work.
- All materials and Contractor's own machinery, equipment, tools & tackles, vehicles, etc.
- Third Party liability.
- Workmen Compensation
- ESIC
- Employer's Liability

The quoted price shall be inclusive of all costs for such insurance coverage including transit insurance and till it is handed over to the employer after its full completion. In all such policies, Owner shall be made 'Co-insured'. Also other Contractors, working at the Site, are covered under the policy.

14. GENERAL

These Special Conditions of Contract (SCC) shall be read in conjunction with the terms and conditions stipulated in the General Conditions of Contract (GCC). However, if there is any contradiction between the terms and conditions mentioned in this SCC and those in the GCC, stipulations of SCC shall prevail to that extent.



ARTICLES OF AGREEMENT

THIS AGREEMENT is made on this ..... day of ..... 2024 between Indian Bank having its Zonal Office at Tiruppur (hereinafter referred to as the "Employer") which expression shall include its successors, legal representatives and assigns of the one part.

AND M/s---------- having its Registered office at..... ..... and Regional Office at .....XXXXXXXXXX.

(hereinafter referred to as the "Contractor") which expression shall include its successors, legal representatives and assigns of the second part.

WHEREAS Employer intends to Design, Engineering, Supply, Installation, Testing and Commissioning of Total Capacity 17 kWp Grid Interactive Solar Photo Voltaic system at below mentioned Indian Bank own premises.

- Location 01: **Indian Bank – Tiruppur Main Branch**

WHEREAS the Employer has caused drawings and tender documents to be prepared by his Bank / Engineer-In-charge (hereinafter referred to as "Bank / Engineer-In-charge").

AND whereas the Employer has called for tenders for the above work as per Employer's NIT dated ----------and whereas the tender dt. ---------- submitted by the contractor has been accepted for such sum as may be ascertained to be payable in terms of the Bill of Quantities and which sum is estimated to be Rs. ... . (Rupees .....) hereinafter referred to as the said "Contract Sum".

AND whereas the Contractor has agreed to execute the work as per drawings, specifications, conditions of contract of the tender and work Order for the Employer's project of".

AND whereas parties herein desirous of reducing the agreed terms into writing as under:

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS: -

1) In consideration of the said Contract Sum to be paid at the times and in the manner set forth in the said Conditions the Contractor shall carry out and complete all the Civil, electrical Works as per terms and conditions herein contained and according to the general conditions of the contract, notice inviting tender, special conditions of contract, general scope of work , technical specifications, schedule of rates and instructions to be given by Bank / Engineer-In-charge and to the entire satisfaction of the Employer.

2) **Contract Price, Taxes and Payment Terms:**

Total contract price is Rs..... which is inclusive of cost of materials, equipment, installation charges and tools and tackles required for execution of the job. Above price is **excluding GST** in respect of this contract. No claim in this respect will be entertained. Income tax on payments shall be levied as per prevailing rules and will be deducted and deposited by Employer in accordance with the law and the provisions of tax deductions at source under Income Tax Act 1961.

However, interim payment will be made as per the site measurements on Item Rate basis and certification of the Bank / Engineer-In-charge:

3) **Completion Period:**

Time is the essence of the Contract. The work is to be completed in all respects within **60 days** from the date of receipt of the Work Order /letter of intent by the Contractor or handing over of site whichever is later. If the Contractor fails to complete the job within the agreed time period the Contractor will have to bear liquidated damages as per the relevant clause

mentioned in the Tender Documents.

4) **Earnest Money:**

The Contractor has deposited Demand Draft / Bank Guarantee for an amount of **Rs 25,500/-** (Rupees Twenty-Five Thousand Five Hundred Only) as Earnest Money. In case of MSE firms, they are exempted from paying the EMD and tender cost, provided the registration with NSIC is valid and the name of activities/services/stores is related to the work called for.

5) **Inspection of Site:**

The Contractor has inspected the site before submitting his tender and has satisfied himself as to the nature of the work to be executed on the site. Any difficulties which the Contractor may come across in the course of the work shall in no way entitle the contractor to claim or receive extra payment unless the Employer is of the opinion that such difficulties could not have been foreseen and the Employer consents in writing. The site will be handed over to the contractor as per the terms of tender and in no case the contractor can claim for non-suitability of site condition for extension of time unless employer opinions the other way.

6) **Supply of Material and Labour:**

The Contractor shall arrange all labour, materials, equipments, tools, tackles and everything necessary for the completion of the work. The Contractor will assume all responsibility for the safety, protection and accounting of all material and equipment and the work during construction. All materials used by the Contractor shall be of the best quality conforming to the required specification mentioned in the tender document and will be subject to the approval of the Bank / Engineer-In-charge/ Employer. All such materials not approved by Bank / Engineer-In-charge/ Employer shall be removed at once by the Contractor at his own expense. The Contractor shall also at his own expense arrange for carrying out any test of materials which the Bank / Engineer-In-charge/ Employer may from time to time require or if so desired by the employer.

7) **Defective Work / Materials:**

If any part of the work done by the Contractor is found defective in workmanship or if bad or inferior materials have been used the Contractor shall at his own risk and cost demolish all such defective work and rebuild the same and / or replace the bad or inferior materials used within a time frame mentioned to the satisfaction of the 'Bank / Engineer-In-charge/ Employer'. The decision of the Employer / Bank / Engineer-In-charge in this regard shall be final and binding on the Contractor. In case of default of the contractor to remove the defective work and rebuild the same or replace bad or inferior materials as directed by the Employer, the Employer shall be entitled to employ anyone else to carry out the same at risk and cost of the Contractor and recover all expenses incurred in this regard from the contractor.
The contractor should not damage the existing water proofing done on the roof. They should discuss about the work they are going to carry out with bank engineer/ Bank / Engineer-In-charge before they take up the work. In case of any damage done to the water proofing and detect leakage due to the same, the contractor will be made responsible to rectify the same at their cost to the full satisfaction of the bank.

8) **Inspection of Work:**

During progress of the work the site engineer of the Employer and Engineer-In-charge/ Employer shall be entitled at all times to have access to and inspect the work. If the work is inspected by the any Government/ Bank's authorized persons, the contractor will fully co-operate and extend all help to meet the observations.

9) **Supervision:**

The Contractor shall provide one or more competent and technically qualified engineers duly and fully authorized to act on his behalf in all matters relating to the works to be carried out under or any other matter concerning this agreement and who shall at all times be present at the works while any work is in progress as per directions, explanations & instructions of

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Employer / Engineer-In-charge.

10) **Compliance with Statutory Regulations & Work Rules:**

The Contractor shall be responsible for complying with the applicable laws / bye laws / Regulations in force from time to time and shall have to bear all statuary liabilities to the workers / personnel engaged for the job. Nothing will be paid extra in this regard. If any amount is paid by the Employer in this regard the same amount shall be deducted from the Contractor's dues. The Contractor shall have to arrange insurance cover for the workers / personnel engaged by him for the job.

11) **Determination of Contract:**

In the event of Contractor failing to keep / adhere to agreed schedule of work, or in the event of the Contractor failing to comply with the provisions of this contract by default and / or negligence and / or suspension of work or in the event of Contractor failing to complete the work within the stipulated period, the Employer may terminate this Agreement forthwith and employ, at the Contractor's risk and cost, another contractor or sufficient number of workmen to complete the work.

12) **Force Majeure:**

In case any Force Majeure condition herein mentioned occurs and continues for a period exceeding 15 days the parties here to undertake to sit together and devise ways for expeditious and proper performance of the obligations of the parties under this order.
This clause will be operative only if the work is delayed by
a) Acts of God
b) Earthquake or floods or similar natural calamities.
c) Serious loss or damage by fire or lightning.

13) **Arbitration:**

"In the event of any dispute or difference relating to interpretation and application of provisions of the contract and all disputes/claims whatsoever which shall either during the continuance of the contract or afterwards either between the parties to the contract or the respective representatives touching the construction/application of any provision/clause mentioned in the contract or any account or liability between the parties to the contract or as to any act or deed or omission of any party to the contract, in any way relating to these presents, shall be first at the discretion of the Bank attempted to be resolved in good faith by mutual discussion within 30 days of the dispute or question being raised failing which the same shall be settled by arbitration in accordance with provisions of Indian arbitration and Conciliation act 1996.

The Parties concerned shall designate an arbitrator on mutual consent/consensus. In the event of no consensus being arrived, an Arbitral Tribunal shall be constituted comprising three Arbitrators, each party appointing one arbitrator and a third arbitrator to be appointed by the two arbitrators so appointed by the parties. The venue of the arbitration shall be exclusively at Chennai and any award passed by arbitrator or the arbitral Tribunal shall be final, conclusive and binding upon the parties and shall be deemed to have been made between parties themselves. The parties to the dispute shall share equally the cost of arbitration as intimated by the arbitrator".

Submitting to arbitration may be considered as an additional remedy and it does not preclude the Parties to seek redressal/other legal recourse.

14) **Engineer-In-charge:**

The term Bank / Engineer-In-charge in the said conditions shall mean Engineer-In-charge for the purpose of this Contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the Contractor shall object for reasons considered to be sufficient by the Employer mentioned in the said Conditions provided always that no person subsequently appointed to be Bank / Engineer-In-charge under this Contract shall be entitled

to disregard or overrule any provision, decision or approval or direction given or expressed by the Bank / Engineer-In-charge for the time being.

IN WITNESS whereof the said contracting parties have set their hands and seals on the day and year first hereinabove witness.

Witness Address Employer

Witness Address Contractor

इंडियन बैंक INDIAN BANK ZONAL OFFICE TIRUPPUR 641602 अंचल कार्यालय

GENERAL CONDITIONS OF CONTRACT

1. INTERPRETATIONS:

In construing these Conditions and the Specifications, Schedule of Quantities and Contract Agreement, the following words, shall have the meanings herein assigned to them except where the subject or context otherwise requires:

(a) **Employer / Client / owner** shall mean **Indian Bank** with their office at Indian Bank, Zonal office Tiruppur and shall include their heirs, legal representatives, assignees and successors.

(b) **Contractor** shall mean the person or the persons, firm or company whose tender has been accepted by the Employer and shall include their heirs, and legal representatives, and permitted assigns.

(c) The **Bank / Engineer-In-charge** shall mean **the Employer / Client / owner**

(d) Engineer – in- Charge shall mean the persons nominated by the Employer/ Bank / Engineer-In-charge and shall include those who are expressly authorized by him to act for and on his behalf for operation of the contract and co- ordination of different works.

(e) **Works** shall mean the works to be executed and recorded in accordance with the Contract and shall include all extra or additional altered or substituted works as required and recorded for the performance of the Contract, and **Site** shall mean the land and other places as shown bounded red on the site plan, on or under which the works are to be executed or carried out and other lands or places provided by the Employer for the purposes of the Contract.

(f) **Contract Documents** shall include the Notice Inviting Tenders, the Articles of Agreement, the General Conditions of Contract, the Special Conditions of Contract, the Appendices, the Priced Schedule of Quantities, Specifications, and drawings pertaining to the work. All sections of this Contract Document are to be read together. Further such correspondence between the Employer and Contractor as admitted by the Employer before award of work and thereafter shall also form part of contract documents.

(g) **Drawings** shall mean the drawings referred to in the Specifications, description of items etc. and any modifications of such drawings approved in writing by the Bank / Engineer-In-charge and such other drawings as may from time to time be furnished or approved in writing by the Engineer-In-charge.

(h) **Notice in Writing** or written notice shall mean a notice in writing, typed or printed characters, sent by the Employer or Bank / Engineer-In-charge (unless delivered personally or otherwise) proved to have been received by registered post to the last known private or business address or registered office of the Contractors and shall be deemed to have been received by them when in the ordinary course of post it would have been delivered.

(k) **Act of Insolvency** shall mean any Act of Insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any Act amending such original act/s.

(l) **Virtual Completion** shall mean that the works are in the opinion of the Engineer-In-charge/ Employer complete or fit for operation.

(m) Words importing persons include firms and Corporations, words importing the singular only also include the plural and vice versa where the context requires.

(n) Headings and marginal notes to these Conditions shall not be deemed to form a part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.

2. SCOPE OF CONTRACT:

The Contractor shall carry out and complete the works in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Bank / Engineer-In-charge/ Employer. The Bank / Engineer-In-charge may in absolute discretion and from time to time issue further drawings and/or written instructions, details, directions and explanations which are hereafter collectively referred to as **Instructions** reflected either in the Minutes of Meetings or in any other form in regard to :-

a. The variation or modification of the design, quality or quantity of works or the addition or omission or substitution of any work.

b. Any discrepancy in or divergence between the Drawings or between the Schedule of quantities and / or Drawings and /or Specifications.

c. The removal from the site of any material brought thereon by the Contractor and the substitution of any other materials thereof.

d. The removal and/or re-execution of any works executed by the Contractor.

e. The postponement of any work to be executed under the provisions of this Contract.

f. The dismissal from the works of any person employed thereupon.

g. The opening up for inspection of any work covered up.

h. The amending and making good of any defects.

i. Co-ordination of work with other agencies appointed by the Employer for due fulfillment of the total work.

j. Deletion of any item of work from the scope of contract.

The Contractor shall forthwith comply with and duly execute any work comprised in such Engineer-In-charge's / Employer's Instructions provided always that verbal instructions, directions and explanations given to the Contractor or his representative upon the works by the Engineer-In-charge/ Employer shall, if involving a variation, be confirmed in writing by the Contractor within 7 days, and if not dissented from in writing within a further 7 days by the Bank / Engineer-In-charge/ Employer such shall be deemed to be the Engineer-In-charge's / Employer's Instructions within the scope of the Contract.

If Compliance with the Engineer-In-charge's / Employer's Instructions involves any variation, such variation shall be dealt with under Clause No. 22.

If the Contractor fails to comply with the Engineer-In-charge's / Employer Instructions within a fortnight after the receipt of written notice from the Bank / Engineer-In-charge/ Employer requiring compliance with such instructions, the Employer through the Bank / Engineer-In-charge may employ some other agency to execute any work whatsoever which may be necessary to give effect to such instructions.

For the purpose of entering day to day instructions by the Engineer-In-charge/ Employer, the Contractor shall maintain at his own cost, a "Site Instruction Book" in triplicate in which the instructions shall be entered by Bank / Engineer-In-charge/ Employer.

3. DRAWINGS AND SPECIFICATIONS:

The Work shall be carried out to the entire satisfaction of the Employer and the Bank / Engineer-In-charge and in accordance with the signed drawings, specifications and other Contract documents and such further drawings and details as may be provided by the Bank / Engineer-In-charge and in accordance with such written instructions, directions and explanations as may from time to time be given by the Employer / Engineer-In-charge.

No drawing shall be taken as in itself an order for execution unless, in addition to the Engineer-In-charge's signature, it is marked "VALID FOR CONSTRUCTION". No claim for payment for extra work shall be allowed unless the said work shall have been executed under the provisions of Clause 10 (Authorities, Notices, Patent Rights and Royalties), or by the authority, directions in writing of the Bank / Engineer-In-charge as herein mentioned.

One complete set of the signed Drawings and Specifications and Schedule of Quantities shall be furnished by the Bank / Engineer-In-charge to the Contractor. The Bank / Engineer-In-charge shall furnish, within such time as he may consider reasonable, one copy of additional drawings which in his opinion may be necessary for the execution of any work. Such copies shall be kept on the works, and the Bank / Engineer-In-charge or his representatives shall at all reasonable times have access to the same. All drawings and specifications shall be returned to the Bank / Engineer-In-charge by the Contractor before the issue of the Final Certificate. A copy of the Contract shall remain in the custody of the Bank / Engineer-In-charge and shall be produced by him at his office as and when required by the Employer or by the Contractor.

Additional prints of drawings, if any, required by the Contractor may be supplied by the Bank / Engineer-In-charge but on the payment of charges.

4. SCHEDULE OF QUANTITIES:

The Schedule of the Quantities unless otherwise stated shall be deemed to have been prepared in accordance with the standard procedure of quantity measurement, and shall be considered to be approximate and no liability shall attach Employer for any error that may be discovered therein.

5. SUFFICIENCY OF SCHEDULE OF QUANTITIES:

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the prices stated in the Schedule of Quantities. The contractor's Rates and Prices shall cover all his obligations under the Contract, and all matters and things necessary for the proper completion of the works.

6. ERRORS IN SCHEDULE OF QUANTITIES:

Should any error appear in the Schedule of Quantities, other than in the Contractor's prices and calculations, it shall be rectified, and such rectification shall not vitiate the Contract but shall constitute a variation of the Contract and shall be dealt with as an authorized extra or deduction.

7. NOTICES

The Contractor shall give all notices and pay all fees and royalties in connection with his constructional activities and shall comply with all Acts and Regulations for the successful completion of the Contract Works.

8. COMMENCEMENT OF WORK AT SITE

The Contractor shall commence his work at site within a maximum period of **14** days from the date of receipt of Letter of Intent / Work Order issued by the Employer or handing over the site, whichever is later. The contractor shall commence the work and shall regularly proceed with and complete the same on or before the date of completion, stated in the Appendix, subject nevertheless to provision of extension of time.

9. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY:

The Contractor shall provide everything necessary for the proper execution of the works according to the true intent and meaning of the Drawings, Specifications and Schedule of Quantities taken together whether the same may or may not be particularly shown or described therein, provided that the same can be inferred there from and if the Contractor finds any discrepancy in the Drawings or between the Drawings, Specifications and Schedule of Quantities he shall immediately refer the same in writing to the Engineer-In-charge, who will decide which shall be followed, and his decision shall be final and binding. The Contractor shall provide ground for himself and fresh water and power for carrying out of the works at his own cost. The Employer shall on no account be responsible for the expenses incurred by the Contractor for hired ground or fresh water obtained from elsewhere. If water from any source other than Municipal main is to be used for construction, the same shall be tested at the Contractor's cost and a report submitted

to the Bank / Engineer-In-charge for his approval, before such water is used for the works.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract and beyond the unit price no extra payment will be allowed for incidental or contingent work, labour and/or materials inclusive of all taxes and duties whatsoever except for specific items, if any, stipulated in the tender documents.

The Contractor shall provide and maintain all measuring and surveying instruments, including steel tapes, theodolites and dumpy levels at all times for properly carrying out the work and for the use of the Bank / Engineer-In-charge/ Employer, including providing skilled attendants as required.

The Contractor shall supply, fix and maintain at his cost during the execution of any works, all the necessary centering, scaffolding, staging, timbering, strutting, shoring, pumping, fencing, hoarding, watching and lighting by night as well as by day required for the proper execution and protection of the public and safety of any adjacent roads, streets, cellars, vaults, pavements, walls, houses, buildings and all other erections, matters or things. The Contractor shall take down and remove any or all such centering, scaffolding, staging, planking, strutting, shoring etc. as occasion shall require or when ordered to do so, and shall fully reinstate and make good all matters and things described during the execution of the work, to the satisfaction of the Engineer-In-charge.

The Contractor shall at all times give access to workers employed by the Employer or any men employed on the buildings and to provide such parties with proper sufficient and if required special scaffolding, hoists and ladders and provide them with water and lighting and leave or make holes, grooves etc. in any work, where directed by the Employer as may be required to enable such workmen to lay or fix pipes, electrical wiring, special fittings etc. The quoted rates of the tenderers shall include all these abovementioned contingent works.

10. AUTHORITIES, NOTICES, PATENTS, RIGHTS&ROYALTIES:

The Contractor shall conform to the provisions of all the statutes relating to the works, and to the Regulations and Byelaws of any local Authority, and of any Public Utility Companies or Authorities with whose systems the structure is proposed to be connected, and shall before making any variation from the drawings or specifications that may be necessitated by so conforming, give to the Bank / Engineer-In-charge written notice, specifying the variations proposed to be made and the reason for making them, and apply for instruction thereon. In case the Contractor shall not within 10 days receive such instructions, he shall proceed with the work conforming with the provision or Regulations or Bye-laws in question.

The Contractor shall bring to the attention of the Bank / Engineer-In-charge all notices required by the said Acts, Regulations or Bye-laws to be given to any Authority by the Employer or the Bank / Engineer-In-charge and pay to such Authority, or to any public Officer, all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Engineer-In-charge. All statutory fees, deposits etc. paid by the contractor for permanent works to be handed over to Employer shall be reimbursed to him by the Employer against documentary proof.

The Contractor shall indemnify the Employer against all claims in respect of patent rights, royalties, design, trademarks of name or other protected rights in respect of any constructional plant, machinery or material used for or in connection with the works or temporary works and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, and shall himself pay all royalties, license fees, damages, costs and charges of all and every sort that may be legally incurred in respect thereof and shall keep the Employer saved harmless and indemnified in all respects from such actions, costs and expenses.

11. MATERIALS AND WORKMANSHIP TO CONFORM TO DESCRIPTION:

All materials and workmanship shall, be of the respective kinds specified in the Schedule of Quantities and /or specifications and in accordance with the Engineer-In-charge's instructions and the Contractor shall upon the request of the Bank / Engineer-In-charge furnish him all invoices, accounts, receipts and other vouchers to prove that the materials comply therewith. The Contractor shall at his own cost arrange for and/or carry out any test of all materials which the contract provides for and Bank / Engineer-In-charge may require. The laboratories, either established by the Contractor on site or independent, shall be approved by the Engineer-In-charge. The Contractor shall submit the samples of various materials to Bank / Engineer-In-charge

for approval well in advance of placing orders.

If the Contractor contends that any of the materials, goods or workmanship specified as aforesaid is unobtainable, he shall submit to the Employer his grounds for his contention, and thereupon the Bank / Engineer-In-charge shall decide whether the same is unobtainable in fact. If the Architect shall decide that any of the materials, goods or workmanship is in fact unobtainable, they shall issue an order in writing as to be substituted thereof and such order shall be deemed to be an order of variation.

12. SETTING OUT:

The Contractor shall at his own expense set out the works accurately in accordance with the plans. The Contractor shall be solely responsible for the true and perfect setting out of the works, and for the correctness of the position, levels, dimensions and alignment of all parts thereof. If at any time any errors shall appear during the progress or on completion of any part of the work or within a period of one year from the virtual completion of work, the Contractor shall at his own cost rectify such error if called upon to the satisfaction of the Bank / Engineer-In-charge/ Employer. The Contractor if required shall further set out the works to the alternative positions at the site until one is finally approved and no extra costs to this effect shall be entertained.

13. REMOVAL OF ALL OFFENSIVE MATTERS:

All soil, filth or other matter of an offensive nature taken out of any trench, sewer, drain, cess-pool, terrace or other place shall not be deposited on the surface, but shall be at once carried away by the Contractor and disposed off as per the rules and regulations of the Local Authorities concerned.

14. OPENING UP WORKS

The Contractor shall give due notice in writing to the Employer / Bank / Engineer-In-charge whenever any work is to be buried in the earth, concrete or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall at the opinion of the Employer / Bank / Engineer-In-charge be either opened up for measurement at the Contractor's expense or no payment may be made for such materials. Should any dispute or differences arise after the execution of any work as to measurements etc., or other matters which cannot be conveniently tested or checked, the notes of the Employer / Bank / Engineer-In-charge shall be accepted as correct and binding on the Contractor.

15. CONTRACTOR'S SUPERINTENDENCE & REPRESENTATIVE ON WORKS:

The Contractor shall give all necessary personal superintendence during the execution of the works and as long thereafter as the Bank / Engineer-In-charge may consider it necessary until the expiration of the "Defects Liability Period" stated in Clause 28. The Contractor shall meet the Employer / Bank / Engineer-In-charge or his representative whenever required if so informed by the Employer / Engineer-In-charge.

The Contractor shall maintain and be represented on site, at all times while the work is in progress, by a responsible and efficient Bank / Engineer-In-charge approved by the Bank / Engineer-In-charge and who must thoroughly understand all the trades entailed and be constantly in attendance, while the men are at work. Any directions, explanations, instructions or notices given by the Bank / Engineer-In-charge to such Engineer – In- charge shall be deemed to be given to the Contractor and shall be binding as such on the Contractor. The Bank / Engineer-In-charge shall be thoroughly conversant with the English Language and should be able to read, write and speak English.

16. DISMISSAL OF CONTRACTOR'S EMPLOYEES:

The Contractor shall on the request of the Bank / Engineer-In-charge/ Employer immediately dismiss from the works any person employed thereon who may, in the opinion of the Bank / Engineer-In-charge/ Employer, be unsuitable or incompetent or un- co-operative or who may misconduct himself and such person shall not again be employed or allowed on the works without the permission of the Bank / Engineer-In-charge/ Employer. Such discharges/dismissal shall not be the basis of any claim or compensation or damages against the Employer / Bank / Engineer-

In-charge or any of their officers or employees. The decision of Bank / Engineer-In-charge/ Employer shall be final and binding on the Contractor. The dismissed person shall be replaced by a person acceptable to Engineer-In-charge/ Employer.

17. ACCESS TO WORKS:

The Bank / Engineer-In-charge/ Employer / Office Manager and any person authorized by them shall at all reasonable times have free access to the works, and to the workshops, factories or other places where materials are being prepared or constructed for the Contract and also to any place where the materials are lying or from which they are being obtained. The Contractor shall give every facility to the Bank / Engineer-In-charge/ Employer and their representative for inspection and examination and test of the materials and workmanship. No person unless authorized by the Bank / Engineer-In-charge or the Employer, except the Representatives of Statutory Public Authorities, shall be allowed on the works at any time. If any work is to be done at a place other than the site of the works, the Contractor shall obtain the written permission of the Bank / Engineer-In-charge for doing so.

18. SITE SUPERVISION

The Contractor shall afford the Engineer-In-charge/ Employer every facility and assistance for examining the works and materials and checking and measuring time and materials.

The Bank / Engineer-In-charge shall jointly record the measurements with Contractor's representative for all items of works.

The Bank / Engineer-In-charge/ Employer shall have the power to give notice to the Contractor or his Engineer In charge about the non-approval of any work or materials and such works shall be suspended or the use of such materials should be discontinued until the decision of the Bank / Engineer-In-charge in consultation with Employer if required is obtained. The work will from time to time be visited by the Bank / Engineer-In-charge/ Employer but such examination shall not in any way exonerate the Contractor from the obligation to remedy any defects which may be found to exist at any stage of the work or after the same is completed. Subject to the limitations of this clause, the Contractor shall take instructions only from the Employer or the Bank / Engineer-In-charge as the case may be. The contractors shall take total responsibility for the execution of work / items of work by using quality materials and providing best of workmanship to fulfill the true intent of the Contract documents.

19. ASSIGNMENT OR SUB-LETTING:

The work included in the Contract shall be executed by the Contractor and the Contractor shall not directly or indirectly transfer, assign or underlet the Contract or any part share thereof or interest therein, nor shall he take a new partner, without the written consent of the Bank / Engineer-In-charge/ Employer and no undertaking shall relieve the Contractor from the full and entire responsibility of the Contract or from active superintendence of the works during their progress.

20. APPROVAL OF SUPPLIERS:

For all supplies, the names of manufacturers/brands have to be got approved by the Bank / Engineer-In-charge and from the Employer after getting the respective samples first approved by the Bank / Engineer-In-charge as the case may be. All materials will be of tested quality and as per relevant Indian Standards. In addition to the Test Certificates, mandatory tests will also be done on them by the Contractor at an approved laboratory at his cost immediately as well as at regular frequency laid down in the relevant Indian Standards.

21. VARIATIONS NOT TO VITIATE CONTRACT:



The Contractor shall when directed in writing by the Bank / Engineer-In-charge to omit from or vary any works shown upon the drawings or described in the Specifications or included in the Priced Schedule of Quantities, carry out such directions but the Contractor shall not make any alterations in the provisions of the Contract without such authorization or direction in writing from the Engineer-In-charge.

No claim for an extra shall be allowed unless it shall have been executed by the authority of the Bank / Engineer-In-charge as herein mentioned. Any such extra is hereinafter referred to as an

authorized extra. No variation, i.e. additions, omissions or substitutions shall vitiate the Contract. The rates of items not included in the Priced Schedule of Quantities shall be promptly submitted by the Contractor for the Engineer-In-charge's approval and shall be settled by the Bank / Engineer-In-charge in accordance with the provisions of Clause 22 thereof.

22. VARIATIONS TO BE APPROVED BY EMPLOYER

The Contractor shall submit through the Bank / Engineer-In-charge a statement of variations giving quantities and rates duly supported by Contract rates of comparable items, analysis of rates, vouchers etc. The rates on final acceptance by the Employer shall form a part of the contract.

In the event such extra / variation items totally differ in specification / character, rates for such items will be worked out based on prevailing market rates for the ingredients that go into making of such items and finalized by the Bank / Engineer-In-charge in consultation with the Employer. Such rates shall however be not eligible for consideration of Price Adjustment Clause, if any.

23. MEASUREMENT OF WORKS:

The Bank / Engineer-In-charge shall from time to time intimate the Contractor that he requires the works to be measured and the Contractor shall forthwith attend or send a qualified agent to assist the Engineer-In-charge's representative in taking such measurements and calculations and to furnish all particulars or give all assistance required by him.

Should the Contractor omit to attend or neglect or omit to send such agent, then the measurements taken by the Bank / Engineer-In-charge or approved by him shall be taken to be the correct measurements. The works shall be measured according to the Mode of Measurements stated in the Preamble to Schedule of Quantities / specifications. The measurement shall wherever not mentioned in the tender be taken in accordance with the Indian Standard and its latest revisions, if any. Measurements in part or full may be checked by the Employer / Engineer-In-charge, as the case may be, for each trade, and for this the Contractor has to render all necessary assistance and cooperation.

The Contractor or his Agent may at the time of measurement take such notes and measurements as he may require.

All authorized extra works; omissions and all variations made without the Engineer-In-charge's knowledge, but if subsequently sanctioned by the Employer in writing, shall be included in such measurements.

24. MEASUREMENT TO BE RECORDED BEFORE WORK IS COVERED UP:

The Contractor shall take joint measurements with the Bank / Engineer-In-charge/ Employer before covering up or otherwise placing beyond the reach of measurement any items of work. Should the Contractor neglect to do so, the same shall be uncovered at the Contractor's expense or in default thereof, no payment or allowance shall be made for such work or the materials with which the same was executed.

25. PRICES FOR EXTRAS ETC. - ASCERTAINMENT THEREOF:

The Contractor may, when authorized, and shall, when directed in writing by the Bank / Engineer-In-charge with the approval of the Employer, add to, omit from, or vary the works shown upon the Drawings, or included in the Schedule of Quantities, but Contractor shall make no addition, omission or variation without such authorization or direction. A verbal authority or direction by the Bank / Engineer-In-charge shall, if confirmed by them in writing within seven days, be deemed to have been given in writing.

No claim for an extra shall be allowed unless it shall have been executed under provisions of Clause hereof or by the authority of the Bank / Engineer-In-charge with the concurrence of the Employer as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions:

(a) i. The net rates or prices in the original tender shall determine the valuation of the extra work where extra work is of similar character and executed under similar conditions as the work priced therein.

ii. Rates for all items, wherever possible, should be derived out of the rates given in the Priced Schedule of Quantities.

(b) The net rates or prices of the original tender as accepted by the Employer shall determine the value of the items omitted, provided if omissions vary the conditions under which only remaining items of works are carried out, the prices for the same shall be valued under sub-clause (c) hereof.

(c) For extra items/substitute items where the description of items is different from that of any tendered item, the following method shall hold good.

Where the extra item works are not of similar character and/or executed under conditions as aforesaid or where the omissions vary the conditions under which any remaining items of works are carried out or if the amount of any omission or addition relative to the amount or the whole of the Contract works or to any part thereof shall be such that in the opinion of the Bank / Engineer-In-charge the net rate or price contained in the Priced Schedule of Quantities or for any item of the works involves loss or expenses beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable or inapplicable, the Bank / Engineer-In-charge with the approval of the Employer shall fix such other rate or price as in the circumstances he shall think reasonable and proper on the basis of actual rate analysis cost of work involved **plus 15% (Fifteen Percent)** towards Contractor's overheads and profits, which shall be final and binding on the Contractor. No escalation shall be entertained on the extra items.

(d) The Contractor shall submit claims for Deviated items and Extra items in approved formats

26. UNFIXED MATERIALS:

When any materials intended for the works shall have been placed at site by the Contractor, such materials shall not be removed there from (except for the purpose of being used in the works) without the written authority of the Bank / Engineer-In-charge and when the Contractor shall have received payment in respect of any Certificate in which the Bank / Engineer-In-charge shall have stated that he has taken into account the value of such unfixed materials on the works, such materials shall become the property of the Employer, and the Contractor shall be liable for any loss or damage to any such materials.

27. REMOVAL OF IMPROPER WORK AND MATERIALS:

The Bank / Engineer-In-charge/ Employer shall, during the progress of the works, have power to order in writing from time to time the removal from the work within such reasonable time or times as may be specified in respect of any materials which in the opinion of the Bank / Engineer-In-charge/ Employer are not in accordance with the specifications or instructions, substitution of proper materials, removal and proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions and the Contractor shall forthwith carry out such order at his own cost. In case of default on the part of the Contractor to carry out such order, the Employer shall have the power to employ and pay other agencies to carry out the same; and all expenses consequent thereon, or incidental thereto, shall be deducted by the Employer from any money due or that may become due to the Contractor. No certificate given by the Bank / Engineer-In-charge shall relieve the Contractor from his liability in respect of unsound work or bad materials.

28. DEFECTS AFTER COMPLETION & PERFORMANCE GUARANTEE:

Any defect, shrinkage, settlement unsound construction ,Technical snag in the machinery or other faults which may appear either in the work executed or in materials used within the "Defects Liability Period" stated in the Appendix hereto arising in the opinion of the Bank / Engineer-In-charge from materials or workmanship not in accordance with the Contract shall upon the directions in writing of the Engineer-In-charge, and within such reasonable time as shall be specified therein, be amended and made good by the Contractor, at his cost unless, the Bank / Engineer-In-charge in consultation with the Employer shall decide that he ought to be paid for such amending and making good and in case of default the Employer may employ and pay another agency to amend and make good such defects, shrinkage, settlements or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Contractor and such damage, loss and expenses shall be recoverable from him by the Employer or may be deducted by the Employer upon the Engineer-In-charge's certificate in

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writing from the amount retained with the Employer vide Clause 39(Certificate and Payment) or any money due or that may become due to the Contractor or the Employer may in lieu of such amending and making good by the Contractor, deduct from such money a sum, to be determined by the Bank / Engineer-In-charge equivalent to the cost of amending such works, and in the event the said amount retained under **Clause 39** (Certificate and Payment) and/or the other sums payable to the Contractor being insufficient, recover the balance from the Contractor.

Whenever the works pertain to or include the construction of any building or in the installed electrical machinery , the Contractor shall be held responsible for the safety of the electrical installation for a period of **12 months** till the expiry of the Defects Liability Period, provided herein, and shall be wholly and exclusively liable for any latent or patent defect or deficiency manifesting itself in the building during such period of ten years and affecting or likely to affect the safety of the building. An undertaking / performance guarantee to this effect on non judicial stamp paper of appropriate value (draft of which shall be furnished by the Employer / Engineer-In-charge.) shall be given by the Contractor.

The Tenderer shall be required to deposit 5% of the tendered value of work as performance guarantee *(format given in Appendix V)* for a period of 6 years in the form of irrevocable bank guarantee of any scheduled bank in accordance with the form prescribed or fixed deposit receipt, within 15 days of the Virtual Completion.

29. CERTIFICATE OF VIRTUAL COMPLETION OF WORKS:

The Contractor shall report in writing to the Engineer-In-charge, in the form of a Certificate as per Proforma 'D' annexed hereto as and when the works are completed in all respects. The Engineer-In-charge/ Employer shall after the verification of the works and in consultation with Bank / Engineer-In-charge issue to the Contractor a certificate to be called "Virtual Completion Certificate", a copy whereof shall be submitted to the Employer to enable him to take possession of the completed works. The Defects Liability period shall commence only from the date of issue of such certificate.

30. OTHER PERSONS ENGAGED BY THE EMPLOYER:

The Employer reserves the right to execute any part of the work included in this Contract by other agency or persons and the Contractor shall allow all reasonable facilities for the execution of such work. The Contractor shall extend all co-operation in this regard.

31. INSURANCE CONTRACT CONDITIONS - CONTRACTOR'S LIABILITY AND INSURANCE

(a) From commencement to completion of works, the Contractor shall take full responsibility for the care of the work and for taking precautions to prevent loss or damage to the work to the maximum extent possible and shall be liable for any damage or loss that may arise to the works or any part thereof from any cause whatsoever including causes of fire, lightning, explosion, earthquake, storm, hurricane, floods, inundation, subsidence, landslides, rock slides, riots (excluding civil war, rebellion, revolution and insurrection) or any latent defect or damage and shall at his own cost repair and make good the same so that at all times the work shall be in good order and condition and in conformity in every respect with the requirements of the Contract.

For the purpose of this condition this expression "from commencement to completion of works" shall mean the period starting with the date of issue of Work Order or date of handing over of site whichever is later and ending with issue of Virtual Completion Certificate.

(b) Without limiting the obligations and responsibilities under this condition, the Contractor shall insure and keep insured the works from commencement to completion, as aforesaid, for the full contract value including Price Variation Adjustment if any against the risk of loss or damage from any cause whatsoever including the causes enumerated in the foregoing Clause (a). In the event of there being a variation in the nature and extent of the works, the Contractor shall from time to time increase or decrease the value of the insurance correspondingly. All the premia for the insurance shall be borne and paid by the Contractor.

The said insurance shall also provide cover for the removal of debris of the lost or damaged works. The said insurance shall be in the joint names of the Employer and the

Contractor, Employer's name being mentioned first in the policies and the Contractor shall deposit with the Employer the said policy or Policies within 15 days from issue of Work Order. All money payable by the insurer under such Policy/Policies shall be recovered by the Employer only and may be paid to the Contractor or any other agency of Employer's choice in instalments for the purpose of rebuilding or replacing or repairing the works and/or goods destroyed or damaged as the case may be.

(c) The Contractor shall at all times indemnify and keep indemnified the Employer against all losses, claims, damages or compensation including under the provisions of the payment of the Wages Act 1936, Minimum Wages Act 1948, Employer's Liability Act 1938,Workman's Compensation Act 1923,the Maternity Benefit Act 1961,the Bombay Shops and Establishments Act 1947,

Industrial Disputes Act 1947, and Contract Labour (Regulation and Abolition)Act 1970 and Employees State Insurance Act 1948, Motor Vehicles Act 1988 or any modifications thereof or under any other law relating thereto and rules made thereunder from time to time or as a consequence of any accident or injury to any workman or other person in or about the work whether in the employment of the Employer or Contractor or not, and also against all costs, charges and expenses of any suit, action or proceedings whatsoever out of such accident or injury or combination of any such claims.

(d) Before commencing the work, the Contractor shall without limiting his obligations and responsibilities under this condition, insure against any loss of life or injury to any personnel in the employment of Contractor. For this purpose, insurance shall be taken by the Contractor. Such insurance shall be taken to include both employees/workmen covered by the Workman's Compensation Act 1923, as well those employees/workmen not covered by the said Act. Separate insurance policies may be taken for employees/ workmen covered by Workman's Compensation Act 1923, and employees / workmen not covered by the said Act. All the premia shall be paid by the Contractor. Policy/Policies taken under this para for the personnel in employment with the Contractor may be in their Employer's names of the Contractor. In the event of any loss or injury to personnel in employment with the Contractor, the Employer and Contractor shall recover directly from the Insurance Company and ensure that payment of the same is made to the affected parties including the Employer. The policy in original shall be deposited with the Employer.

(e) The Contractor shall at all times indemnify and keep indemnified the Employer against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance of the work and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto. Before commencing the execution of the works, the Contractor shall without in any way limiting his obligations and liabilities under this condition, insure at his cost and expense against any damage or loss or injury which may be caused to any person or property including the employees and directors of the Employer / Bank / Engineer-In-charge and their property by or in the course of the execution of the works. Such insurance to be known as the Third Party Insurance shall be in a sum of **Rs.5.0 Lakhs (Rupees Five Lakhs Only)**. The Insurance policy to be so obtained by the Contractor shall be deposited by the Contractor with the Employer within fifteen days of its issue by the Insurer.

(f) The Contractor shall provide the Employer with documentary evidence from time to time, that he has taken all the insurance policies mentioned in the foregoing paragraphs and renewed them if required and that he has paid the necessary premia for keeping the policies valid till the works are completed and handed over to Employer.

(g) The Contractor shall ensure that similar insurance policies are taken out by his sub-Contractors or nominated Contractors, if any. The Contractor shall be responsible to the Employer or to any other person for any claim or loss resulting from the failure of the Sub-contractors or nominated Sub-Contractors to obtain such insurance policy. While taking the insurance policies, Contractor should indicate clearly to the insurance companies that policies issued shall cover their Sub-Contractors and nominated Sub-Contractors also.

(h) If the Contractor and/or his sub-Contractor or nominated Sub Contractor, if any, shall fail to effect and keep in force the insurance referred to above or any other insurance which he / they may be required to effect under the terms of the Contract, then in any such case, the Employer may, without being bound to effect and keep in force any such insurance

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policy pay such premium or premia, as may be necessary for that purpose from time to time and deduct the amount so paid by the Employer from any money due or becoming due to the Contractor or recover the same as a debt due from the Contractor.

(i) All insurance to be effected by the Contractor, and/or his sub-Contractors, or nominated sub-Contractors, if any, shall be taken only with an Insurance Company approved by the Employer.

(j) Without prejudice to any of its obligations and responsibilities under this condition, the Contractor shall, within 30 days from the date of the Work Order and thereafter at the end of each quarter submit a report to the Employer in Proforma 'C' annexed hereto the detailed information on the Insurance Policies as prescribed in the said proforma together with relevant documentary evidence.

(k) No work shall be commenced by the Contractor unless and until he has obtained the insurance or insurances required to be obtained by him under or by the foregoing clauses and no work shall be carried out or continued by the Contractor unless and until such insurance is current and valid at that time. All the receipts in original along with two photo copies thereof, for the payment of the premia shall be furnished by the Contractor to the Employer. The original receipts will be returned to the Contractor after verification. The Employer reserves the right for payment for works done subject to fulfillment of this condition and shall instruct the Architect accordingly.

(l) In the event of any claim for insurance becoming due on account of any eventuality covered by the respective insurance policy/policies, the Contractor shall reinstate the installation, replace the materials or equipment's or pay compensations to the affected personnel/ Employees without waiting for settlement of the claim from insurance company.

(m) If the Contractor shall not perform and observe any of the duties and obligations devolving upon him hereunder, and such omission or breach by the Contractor shall involve the Employer in any liability tortuous or otherwise and/or loss or damage, the Employer shall be entitled to the restitution of such loss or damage and shall be entitled to recover the amount of restitution from any moneys due to the Contractor from the Employer under this Contract or any other Contract.

32. TO DEFINE TERMS AND EXPLAIN PLANS:

The various parts of the Contract are intended to be complementary to one another; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained therein, the explanations of the Bank / Engineer-In-charge shall be final and binding. The correction of any errors or omissions of the Drawings and Specifications may be made by the Engineer-In-charge, when such correction is necessary to bring out clearly the intention which is indicated by a reasonable interpretation of the drawings & Specifications as a whole.

33. TIME OF COMPLETION:

TIME IS THE ESSENCE OF THIS CONTRACT

The Contractor shall make all efforts to complete the work in time. Any delays, actual or expected, shall be made up by increasing manpower inputs and working in more than one shift, without any extra cost.

The entire work is to be completed in all respects within the stipulated period given in APPENDIX TO GENERAL CONDITIONS OF CONTRACT. The work shall be deemed to be commenced 14 days from the date of WORK ORDER or date of handing over of site, whichever is later.

The work shall not be considered as complete until the Bank / Engineer-In-charge has certified in writing that this has been completed and the Defects Liability Period shall commence from the date of such certificate.

PROGRESS OF WORK

During the period of construction the Contractor shall maintain proportionate progress on the basis of a Programme Chart submitted by the Contractor immediately before commencement of work and agreed to by the Employer / Engineer-In-charge. The Contractor shall also include planning

for procurement of scarce material well-in-advance and reflect the same in the Programme Chart so that there is no delay in completion of the period project.

34. DELAY AND EXTENSION OF TIME:

If in the opinion of the Bank / Engineer-In-charge the works be delayed (a) by Force Majeure or (b)by reason of any exceptionally inclement weather or (c) by reason of proceedings taken or threatened by or dispute with adjoining or neighboring Employer's or Public Authorities arising otherwise than through the Contractor's own default or (d) by the works or delays of other Contractors or tradesmen engaged or nominated by the Employer or the Bank / Engineer-In-charge and not referred to in the Schedule of Quantities and/or Specifications or (e) by reason of the Engineer-In-charge's instructions or (f) by reason of civil commotion, local combinations of workmen or strike or lock-out affecting any of the building trades or (g) in consequence of the Contractor not having received in due time necessary instructions from the Bank / Engineer-In-charge for which he shall have specifically applied in writing or (h) from causes which the Employer may consider as beyond the control of the Contractor or (i) in the event the overall scope of work is increased due to changes in drawings and specifications leading to an increase in cost of more than 30% of the original Contract Amount. Extension of time will be granted for a reasonable period on receipt of a written request from the contractor with all supporting documents.

35. LIQUIDATED DAMAGES FOR DELAYED COMPLETION:

(a) If the Contractor fails to complete any or all the works by the date/s named in **Clause 33** (Date of Completion) or within any extended time under **Clause 34**(Extension of Time) then the Contractor shall pay or allow the Employer the sum to be worked out at **1%** of contract value per week to be recovered as Liquidated Damages (and not by way of penalty) for the delay, beyond the said date or extended time, as the case may be, during which the works shall remain unfinished and such damages may be deducted from any moneys due or which may become due to the Contractor. The maximum amount of Liquidated damages shall be **10%** of contract value. The contractor shall be bound to extend validity of Insurance Cover till such period of completion as may be considered necessary at their cost.

(b) Liquidated damages shall also be similarly levied for failure to attain intermediate milestones if applicable as follows: -

The absolute maximum amount of liquidated damages shall be 10% of final Contract Value.

36. FAILUREOFCONTRACTORTOCOMPLYWITHENGINEER-IN-CHARGE INSTRUCTIONS:

If the Contractor after receipt of written notice from the Bank / Engineer-In-charge with prior Consultation of Employer requiring compliance with such further drawings and/or instructions to remove, fails within seven days to comply with the same, the Bank / Engineer-In-charge with prior consent of the Employer may employ other persons to execute any such work whatsoever as may be necessary to give effect thereto and all costs incurred in connection therewith shall be recoverable from the Contractor by the Employer on a certificate by the Bank / Engineer-In-charge as a debt to be deducted by him from any moneys due or to become due to the Contractor.

37. SUSPENSION OF WORKS:

The Bank / Engineer-In-charge may in an extreme case and in prior consultation with the Employer suspend works if the quality or safety of the works is likely to be compromised due to heavy rains, natural calamities, etc. The Bank / Engineer-In-charge may grant such extension of time with the approval of the Employer as may be justified by such a delay in works. The Contractor shall not be entitled to any compensation on account of such delay.

38. DETERMINATION OF CONTRACT:

If the Contractor except on account of any legal restraint upon the Employer preventing the continuance of the works, or on account of any of the causes mentioned in Clause 34(Extension of time) or in the case of a certificate being withheld or not paid when due, shall suspend the

works, or, in the opinion of the Engineer-In-charge, shall neglect or fail to proceed with due diligence in the performance of his part of the Contract or if he shall more than once make default in the respects mentioned in Clause 27 (Removal of improper work and materials), the Employer through the Bank / Engineer-In-charge shall have power to give notice in writing to the Contractor requiring that the works be proceeded with in a reasonable manner and with reasonable dispatch.

Such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must signify the act or defaults on the part of the Contractor upon which it is based. After such notice shall have been given, the Contractor shall not be at liberty to remove from the site of work, or from any ground contiguous thereto, any plant or materials belonging to him which shall have been placed thereon for the purpose of the works, and the Employer shall have lien upon such plant and materials to subsist from the date of such notice being given until the notice shall have been complied with. If the Contractor shall fail, for 7(seven) days after such notice has been given to proceed with the works as therein prescribed, the Employer may enter upon & take possession of the works and of all such plant and materials thereon intended to be used for the work, and the Employer shall retain and hold a lien upon all such plant and materials until the works shall have been completed under powers hereinafter conferred upon him. If the Employer shall exercise the above power, he may engage any other person to complete the works and exclude the Contractor, his agents and servants, from entry upon or access to the same, except that the Contractor or any person appointed in writing may have access at all reasonable times during the progress of the works to inspect, survey and measure the works. Such written appointment or a copy thereof shall be delivered to the Bank / Engineer-In-charge before the person so appointed comes on to the works, and the Employer shall take such steps as in the opinion of the Bank / Engineer-In-charge may be reasonably necessary for completion of the works, without undue delay or expenses, using for that purpose the plant and materials above mentioned in so far as they are suitable and adaptable to such use. Upon the completion of the work the Bank / Engineer-In-charge shall certify the amount of the expenses properly incurred consequent on and incidental to the default of the Contractor as aforesaid and in completing the works by other persons. Should the amount so certified as the expenses properly incurred be less than the amount which would have been due to the Contractor upon the completion of the works by him, the difference shall be paid to the Contractor by the Employer, Should the amount of the former exceed the latter, the difference shall be paid by the Contractor to the Employer. The Employer shall not be liable to make any further payment or compensation to the Contractor for or on account of the proper use of the plant for the completion of the works under the provision hereinbefore mentioned other than such payment as included in the Contract. After the works shall have been so completed by persons other than Contractor, under provision hereinbefore contained, the Bank / Engineer-In-charge shall give notice in writing to the Contractor to remove his plant and all surplus materials as may not have been used in the completion of the works from the site. If such plant and materials are not removed within a period of 14 days, after the receipt of notice, the Employer may remove and sell the same, holding the proceeds, less the cost of the removal and sale, to the credit of the Contractor. The Employer shall not be so responsible for any loss sustained by the Contractor from the sale of the plant in the event of the Contractor not removing it after notice.

39. CERTIFICATE & PAYMENT:

All bills shall be prepared by the Contractor in the form prescribed in **APPENDIX - II**. Normally one interim bill shall be prepared each month subject to minimum value for interim certificate as stated in these documents. The bills in proper forms must be duly accompanied by detailed measurements in support of the quantities of work done and must show deductions for all previous payments, retention money etc.

The Employer, based on a certificate by the Bank / Engineer-In-charge and after a cursory study of the interim bill shall release approx. 70% of his assessed gross value of the bill as an adhoc lump sum within one week of the presentation of the bill together with required documentation. The Employer shall make payment within a week of receipt of the Engineer-In-charge's Certificate.

The Bank / Engineer-In-charge after detailed scrutiny of the interim bill shall certify full payment within 10 days of the date of receipt of interim bill from the Contractor subject to submission of documentation, as required. The Employer shall make payment within 15 days of receipt of the Engineer-In-charge's certificate.

The amount stated in an interim certificate shall be the total value of work properly executed and % of invoiced value of Contractor's materials (as per payment terms) brought to site for permanent incorporation into the work up to the date of the bill less instalments previously paid under these

conditions, provided that such certificate shall only include the value of said material and goods as they are reasonably, properly and not prematurely brought to or placed adjacent to the work and then only if adequately protected against weather or other causalities.

The cost of materials supplied by the Employer shall be recovered from Contractor's bills.

The Bank / Engineer-In-charge shall have the powers to withhold any Certificate if the works or any parts thereof are not carried out to his satisfaction.

The Bank / Engineer-In-charge may by any Certificate make any correction in any previous certificates which shall have been issued by him.

The Contractor shall submit interim bills only after working out the appropriate measurements jointly recorded with Bank / Engineer-In-charge at site in a register and showing the register to Engineer-In-charge. This is not only to regulate the correctness of the quantity but also to facilitate expeditious clearing of the bills.

If any part/reduced rate is proposed by the Contractor (recommended by Engineer-In-charge) the same should be brought out in an annexure to the Bill.

The Employer may carry out test checking of measurement as and when required.
The Contractor shall be paid % of the value of the materials (as per payment terms) brought and stacked at site on a Certificate, issued by the Engineer-In-charge, in regard to quantity and in conformity with the Contract Specifications. No advance shall however be paid for perishable materials. On payment, the property in goods shall vest in the Employer and the Contractor will keep it in his custody indemnifying the Employer against any damage, loss, theft or mishap attributable to their storage.

The Final Bill shall be certified for payment by Bank / Engineer-In-charge within 21 days of submission of the bill supported by proper documentation and after full compliance of the Contract requirements for all technical submittals.

Payments upon the Engineer-In-charge's Interim and final certificates shall be made as far as practicable within a period named in the Appendix-I as "Period of Honoring of Interim and final Certificates" after such Certificates have been delivered to the Employer.The acceptance of payment of the final bill by the Contractor would indicate that he will have no further claim in respect of the executed work.

The items in the Bill shall be listed separately in 3 categories:

(a) Tender items
(b) Deviated items
(c) Extra items

Contractor shall, without fail, submit along with his Interim Bills /Final Bill the test certificates to the Bank / Engineer-In-charge for all electrical appliances, equipments, concrete, steel and cement as also chemical analysis for basic materials like fine and coarse aggregates, cement, construction water, reinforcement steel, etc. all in conformity with latest relevant I.S. Codes, as also concrete cube test results for the concrete poured at site.

Such test certificates and results shall be presented to and certified for acceptance by the Bank / Engineer-In-charge in consultation with the Architect before submission along with Interim Bills/Final Bill.

Together with As-Built drawings the Contractor shall also submit all operating and maintenance manuals and full details of all materials used in the works with suppliers' / manufacturer's names before the final payment is certified.

Interim Bills/Final Bill received without the test certificates/results duly approved by Bank / Engineer-In-charge shall be returned to the Contractor for the reason of the same being not submitted duly.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilled work to be removed and taken away and

reconstructed, or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall it conclude, determine or affect in anyway the power of the Employer under these Conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract.

40. NOTICES:

Notices of the Employer to the Bank / Engineer-In-charge or the Contractor may be served personally or by being left out from the place of work or sent by registered post to the last known place of abode or business of the party to whom the same is given or in the case of the Contractor by being left on the works. In the case of company or Corporation, Notices may be served at or sent by registered post to the Registered office of the Company or Corporation.

Any notice sent by registered post shall be deemed to be served at the time when, in the ordinary course of post, it would be delivered.

41. TERMINATION OF CONTRACT BY THE EMPLOYER

If the Contractor being an individual or a firm, commits any "Act of insolvency" or shall be adjudged as Insolvent or being an incorporated Company shall have an order for compulsory winding up or applies for voluntary winding up or subject to the supervision of the Court and of the Official Assignee or the Liquidator in such acts of Insolvency or winding up shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Employer/Bank / Engineer-In-charge that he is able to carry out and fulfill the Contract, and to give security therefore, if so required by the Employer/Engineer-In-charge.

or if the Contractor (whether an individual; firm or incorporated Company) shall suffer execution to be issued, or shall suffer any payment under this Contract, to be attached by or on behalf of any of the creditors of the Contractor,

or shall charge or encumber this Contract or any payments due or which might become due to the Contractor there under,

or shall assign or sub-let the Contract without obtaining the prior consent in writing of the Employer or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor,

or if in the opinion of the Employer the contractor,

(i) has abandoned the Contract, or

(ii) has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for seven days after receiving from the Bank / Engineer-In-charge written notice to proceed, or

(iii) has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or

(iv) has failed to remove materials from the site or to pull down and replace work for seven days after receiving from the Bank / Engineer-In-charge written notice that the said materials or work were condemned and rejected by the Bank / Engineer-In-charge under these conditions, or

(v) has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this Contract to be observed and performed by the Contractor, or

(vi) has to the detriment of good workmanship or in defiance of the Engineer-In-charge's instructions to the contrary sublet any part of the Contract.

then in any of the said cases the Employer may notwithstanding any previous waiver, after giving seven days notice in writing to the Contractor, determine the Contract but without thereby affecting the powers of the Employer or the obligations and liabilities of the Contractor, the whole of which shall continue in force as fully as if Contract had not been so determined and as if the works subsequently executed had been executed by or on behalf of the Contractor (without thereby

creating any trust in favour of contractor). Further, the Employer, may enter upon and take possession of the work and all plant, tools, scaffoldings, sheds, machinery, steam and other power, utensils and materials lying upon the premises or the adjoining lands or roads and seal the same as his own property or may employ the same by means of his own servants and workmen carrying on and completing the works or by employing any other contractors or other persons to complete the works, and the Contractor shall not in any way interrupt or do any act, matter or things to prevent or hinder such other contractor or other person or persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient, the Employer / Bank / Engineer-In-charge shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of 14 days after receipt thereof by him the Employer shall sell the same by public auction, and shall give credit to the Contractor for the amount realized after deducting there from the costs of removal and sales by the Employer for the values of the said plant and material so taken possession of by the Employer and the expense or loss which the Employer shall have been put to in procuring the works to be completed and the amount, if any, owing to the Contractor and the amount which shall be so payable shall thereupon be paid by the Employer to the Contractor, or, by the Contractor to the Employer, as the case may be, On termination of the Contract, the Contractor shall forthwith remove himself and his workmen from the works site.

42. PHOTOGRAPHS OF WORKS CARRIED OUT:

The Contractor shall every month supply at his own cost two copies of minimum 8 nos. 8" x 5 1/2" coloured photographs of the works carried out from time to time as per the instructions of the Architect. In the event of any dispute or termination of Contract either by the Employer or the Contractor as provided for in the aforesaid **Clause 41**, the Contractor shall arrange to obtain photographs of the works completed upto the date of such termination of Contract.

43. FORECLOSURE OF CONTRACT IN FULL OR IN PART:

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

44. INSPECTION OF SITE AND SUFFICIENCY OF TENDER:

(a) The Contractor shall inspect and examine the site and its surrounding and shall satisfy himself before submitting his tender as to the nature of the ground, and sub-soil, the form and nature of the site, the quantities and nature of the work and materials necessary for the completion of the works and means of access to the site, the accommodation he may require and in general, shall himself obtain all necessary information as to risk, contingencies and other circumstances which may influence or affect his tender.

(b) The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for proper completion and maintenance of the works.

(c) No extra charges consequent on any misunderstanding or otherwise shall be allowed.

(d) The Contractor shall, on the basis of his findings emerging from the study of the subsoil conditions, examine the foundation drawing furnished in the tender and shall be at liberty to submit his objections or suggestions of the proposed foundation as may be relevant to subsoil conditions found by him directly to Engineer-In-charge. The Contractor shall not be entitled to recover the cost of ascertaining the ground and subsoil conditions at the site and such cost shall be deemed to be included in the rates tendered by the Contractor.

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45. NOTICE TO LOCAL BODIES:

The Contractor shall be registered with & comply with and give all notices required under any law,

rules, regulations, or bye-law of Parliament, State Legislature or Local Authority relating to works. The Contractor shall before commencing the execution of work issue a certificate to the Employer / Architect that he has obtained all the permissions Registrations for carrying out the work & engaging various kinds of labour and give all the notices as are required to be obtained or given under law particularly blasting permission, Police permission etc.

46. TOTAL SECURITY DEPOSIT (S.D):

The Contractor shall within 7 days of receiving the WORK ORDER submit a initial security deposit of 2% of the contract value in the form of Demand Draft draw in favour of Indian Bank, Zonal Office Tiruppur or a Bank Guarantee in an approved format at which stage the Demand draft (DD) or Bank Guarantee submitted in lieu of E.M.D shall be returned. On acceptance of the DD or Bank Guarantee by the Employer, the Earnest Money Deposit shall be refunded to the Contractor.

In addition an amount equal to 3% of the value of each bill will be recovered as retention amount. This, together with the initial S.D. of the 2% referred to above, will constitute the total Security Deposit and on virtual completion of work the employer shall refund 50% of the total Security Deposit. The remaining 50% will be refunded after completion of the **Defect Liability Period of 12 months**. For MSME registered firms, the retention money shall be released against money guarantee before settling the interim or final bill of the work.

47. WATER AND ELECTRICITY:

(a) The contractor should make his own arrangements for required water, supply, drainage (including temporary drainage of subsoil dewatering as required by Authorities) etc. at the work site during the currency of contract at their ***own expenses.***

(b) In the event of unavailability of power from Utility Companies, the Contractor shall make arrangements for installing D.G. Set(s) of adequate capacity at his own cost. Responsibility for getting temporary power for construction shall remain with the Contractor. Consumption charges will be payable by the Contractor. Temporary power connection shall be in the Employer's name. Deposits to the Electric Supply Company shall be paid by the Contractor and shall be reimbursed to him based on actuals on production of supporting vouchers/receipts for the same.

48. SCHEDULE OF QUANTITIES-NO CLAIM BECAUSE ACTUAL QUANTITIES DIFFER FROM PRELIMINARY STATEMENT.

A Schedule of probable quantities in respect of work and Specifications accompany these Conditions. The schedule of probable quantities is liable to alterations by omissions, deductions or additions at the discretion of the Engineer-In-charge.

The quantities of the various kinds of work to be done and materials to be furnished under this Contract which have been estimated and are set forth in the proposal or the Agreement or the lists of Contract Prices, are the best available, but may not be accurate in any or all particulars and are only for the purpose of comparing on a uniform basis the bids offered for the works under this Contract.

The Contractor agrees that neither the Employer nor the Bank / Engineer-In-charge nor any of the employees or agents hereof shall be held responsible if any of the said estimated quantities shall be found to be not even approximately correct in the construction of the works and that he will not at any time dispute or complain of such statement nor assert that there was any misunderstanding in regard to the character, size and type of work to be done or the kind or amount of the materials to be furnished or work to be done.

Further the Contractor shall make no claim for anticipated profits, for loss of profits or for damages because no work is ordered under certain items or because of differences between the quantities of the various kinds of work to be done or materials actually delivered and the estimated quantities set forth by the Employer or the Engineer-In-charge.

49 ACCESS FOR INSPECTION:

The Contractor shall provide at all times during the progress of the works and the maintenance period proper means of access, ladders, gangways etc. and the necessary attendants to move and adapt the same as directed for the inspection or measurement of the works by the Bank /

Engineer-In-charge or his representatives.

50. DIMENSIONS:

Figured dimensions are in all cases to be followed and in no case should they be scaled. Large scale details take precedence over small scale drawings. In case of discrepancy, the Contractor is to ask for an explanation before proceeding with the work.

51. PROGRAM OF WORK:

The Contractor shall, along with his bid, submit a schedule for completion of work, either in the form of a CPM Net-Work or in the form of a Bar Chart, showing how he proposes to complete the works. This program shall be prepared in sufficient detail and shall indicate, among other things, the following details on a month-to-month basis (for each month).

(a) Quantum of work under each major item of work that would be carried out.

(b) Amount of resources that would be deployed (e. g. materials, skilled / unskilled labour, equipment etc.)

(c) Schedule of delivery of materials to site.

(d) Cash Flow with approximate value of work contemplated to be completed each month.

(d) Schedule and manner in which details or materials (to be issued by the Employer, if any) are required from the Engineer-In-charge/Employer.

(f) Time periods allowed for other agencies' works.

(g) Various milestones to be achieved.

The program, suitably amended after discussions with the Engineer-In-charge, shall become binding on the Contractor. However, during the execution of the project, should it become necessary, in the opinion of the Bank / Engineer-In-charge to reschedule some of the activities, the Contractor shall do so at no extra cost and/or without any other claim. The contractors are allowed to submit joint venture partnerships agreement with firms having electrical licenses (A, ESA) Hence the License of the JV firm can be utilised for the job.

Acceptance of a bidder's tender does not necessarily imply acceptance of the schedule submitted and the Bank / Engineer-In-charge/ Employer reserves to himself the right to modify / amend this schedule to suit the overall project schedule and the Contractor shall adhere to these revisions/modifications at no extra cost to the Employer.

52. CLEARING THE SITE OF WORKS ON COMPLETION:

The Contractor shall clear site of works as per the instructions of the Engineer-In-charge. The site of works shall be cleared of all men, materials, sheds, etc. belonging to the Contractor. The site shall be delivered in a clean and neat condition as required by the Bank / Engineer-In-charge within a period of one week after the job is completed. In case of failure by the Contractor, the Employer under advice of the Bank / Engineer-In-charge will have the right to get the site cleared at the risk and cost of the Contractor to the satisfaction of the Engineer-In-charge.

53. COMPLETION DRAWINGS / TECHNICAL LITERATURE:

The Contractor shall submit one set of reproducible and CD's and four sets of As-Built drawings to Bank / Engineer-In-charge at his own cost. The Contractor shall also submit 2 copies of detailed catalogues and technical literature and maintenance manuals of all materials / equipment used in the works together with the names and addresses of suppliers / manufacturers.

54. OBTAINING INFORMATION:

No claim by the Contractor for additional payment will be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the works, nor will any misunderstanding or the obtaining of incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the

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fulfillment of the contract.

55. SAFETY RULES

55.1 The Contractor shall follow the latest editions of Safety Codes hereunder:

The contractor shall follow the latest safety rules according to the Indian Electricity Rules of 1956, Electrical Inspectorate Requirements & BIS (Bureau of Indian Standards).

The following are General Safety Rules.

IS 3696 – Part I - Safety Codes for Scaffolds and ladders scaffolds
IS 3696 – Part II - -Do- Ladders
IS 5216 – 1982 - Code of safety procedures and practices in Electrical works

The following safety regulations shall also be followed. In case of discrepancy between the codes and the following regulations, the more stringent of the two shall apply.

55.2. Personal Safety Equipments:

i) All necessary personnel safety equipment as considered adequate by the Bank / Engineer-In-charge should be kept available for the use of the persons employed on the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.

ii) All personnel of the Contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.

iii) Adequate precautions shall be taken to prevent danger from electrical equipment.

iv) The Contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Whenever men above the age of 18 are employed on the work of lead painting, the following precautions should be taken:

a) No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.

b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scraped.

c) Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of the work.

v) No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

vi) When the work is done near any public place where there is risk of drowning all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger.

vii) i Adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

55.3. General

i) Adequate washing facilities should be provided at or near places of work.

ii) These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the Contractor.

iii) To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the Contractor shall be open to inspection by the Labour Officer, Bank / Engineer-In-charge and Employer.

iv) Notwithstanding the above clauses there shall be nothing in these to exempt the Contractor from the operations of any other Act or Rule in Force in the Republic of India.

56.0 DRAWINGS AND DOCUMENTS:

56.1 DRAWINGS TO BE FURNISHED BY BIDDER AFTER AWARD OF CONTRACT

The Contractor shall furnish the following drawings and obtain approval.

a) General arrangement and dimensioned layout

b) Schematic Drawing showing the requirement of SV panel, Power conditioning Unit(s), Junction Boxes, AC and DC Distribution Boards, meters etc.

c) Structural drawing along with foundation details for the structure

d) Itemized bill of material for complete SPV plant covering all the components and associated accessories.

e) Overall layout showing SPV Plant.

f) Format for reports and charts for analysis of various parameters

g) SLD showing all the equipments till the final connection to the grid.

6.2 TECHNICAL BID DELIVERABLES

For PV plant of Total capacity 17 kWp following details are to be provided during detailed engineering:

1. Systems Diagram
2. Electrical Line Diagram
3. Structure design drawings and material specifications 4.
Structure design calculations.
5. PV panels and structure installation drawings, indicate row spacing 6.
Specifications SPV power plant.
7. PV module and inverter data sheets
8. PV array and inverter design calculations
09. DC and AC electrical Balance of System design calculations
10. DC and wiring diagrams
11. DC and AC cable sizes
12. Earthing system diagram
13 Detailed Bill of Quantity, Bill of Materials, and specifications inclusive of Vendor names, model nos. and Contact details
14. Plant power performance ratio calculations and guarantee.
15. Plant energy performance ratio calculations and guarantee
16. Plant performance simulation using PV system.
17. Estimated yearly degradation of PV module power output.
18. Estimated plant energy generation in the first year till 25th year
19. Total foot print area required for the plant.
20. Completely filled Guaranteed Technical Particulars (GTP)

APPENDIX TO GENERAL CONDITIONS OF CONTRACT

Clause No			
46	a	**Earnest Money Deposit**	**Rs 25,500/-** (Rupees Twenty Five Thousand Five Hundred only)**(refundable).**
	b	Initial Security Deposit (S.D)	2% of the total contract value (shall be submitted within 7 days of receiving Work Order)
	c	Retention Amount (RMD)	5% of actual value of the work
	e	Total Security Deposit (SD)	7% of the total contract price [Initial S.D (2%) + RMD (5%)]
28		**Defects Liability Period**	**12 Months from the date of virtual completion.**
8		Date of Commencement	15 days from the date of issue of Work Order/letter of intent or date of handing over site, whichever is later
33		Date of Completion	30 **days** from the date of issue of Work Order / Letter of intent or date of handing over site, whichever is later
35		Liquidated Damages for Delay	**1**% per week of the Contract Value for intermediate and final deadlines subject to maximum total of **10%** of Contract value.
39		Frequency of Interim Certificate	Monthly
39	(i)	Minimum Value of work for the issue of Interim Certificate	**Rs. 3 Lakhs (Rupees Three Lakhs Only)**
	(ii)	Period of honouring Interim Certificate by Employer	15 days from the date of receipt of Bill recommendations- from Engineer-In-charge
	(iii)	Period of honouring Final bill	Six weeks from the date of receipt of Bill recommendations - from Engineer-In-charge with all supporting documents submitted by the contractor
28		Period of Performance Guarantee	Six years from the date of virtual completion. The Tenderer shall be required to deposit 5% of the Executed value of work as performance guarantee ***(format given in Appendix V)*** for a period of 6 years in the form of irrevocable bank guarantee of any scheduled bank in accordance with the form prescribed or fixed deposit receipt, within 15 days of the Virtual Completion.

Name, Signature & Stamp of Contractor

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APPENDIX - II

PROFORMA 'B1'

MEASUREMENT SHEET

Running Bill No. _____

Name of the Work _____

Name of the Contractor _____

Sr. No.	Item	Qty. as per contract	Unit	No. / Length	Qty. of Present Bill

NOTE: Quantity of Present Bill shall be carried forward to Interim Bill.

PROFORMA 'B2'

INTERIM BILL

Interim Bill No. _____

Name of the Work _____

Name of the Contractor _____

S. No.	Item	Unit	Qty. as per Contract	Qty. upto previous bill	Qty. of present bill	Total Qty.	Unit Rate	Gross Amount

Total cumulative Gross Amount of Bill Rs. _____.

Gross Amt. of the present Bill = Gross Amt. of bill – Gross Amt. upto previous bill

APPENDIX - III

PROFORMA 'C'

(See Clause **31(j)**of General Conditions.)

CONTRACTOR'S LIABILITY AND INSURANCE SUMMARY

Name & Number of Insurance Policy with description	Value of Insurance	Validity Period	Loss or damage to work (covered under Policy) or any part thereof and all materials at site from any cause, whatsoever
1.	2.	3.	4.
a)			
b)			
c)			

Damage, loss or injury to any property of the Employer's or Engineer-In-charge or his agents and servants	Claims under the Workman compensation Act 1923,the Minimum Wages Act 1948 & Contract Labour (Regulation and Abolition) Act 1970	Remarks
5.	6.	7.
a)		
b)		
c)		

NB: Details of further policies taken if any and the loss or damage if any under that policy may please be indicated separately at appropriate places.

Signature of Contractor

Address:

Witness:

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APPENDIX - IV

PROFORMA 'D'

REPORT OF VIRTUAL COMPLETION
(See Clause 29 of General Conditions)

Draft of letter to be written by the Contractor to the Bank / Engineer-In-charge in connection with the Virtual Completion Certificate as per Clause No. 29 of General Conditions of Contract.

Having executed the work in terms of the Contract, we hereby certify and affirm that we have virtually completed the contracted works.

We hereby certify that the work has been executed wholly to our satisfaction and with the materials and workmanship in accordance with the contract.

We do certify further that we have executed the work in accordance with the applicable laws and without any transgression of such laws.

APPENDIX – V

Bank Guarantee No. **Date:**

PERFORMANCE BANK GUARANTEE

Indian Bank, a body Corporate constituted under the Banking Companies Acquisition and transfer of undertaking Act, having its Zonal Office TIRUPPUR (hereinafter referred to as Indian Bank) have entered into Agreement/Contract/Order No.---------- dt ---------- (hereinafter called "the said Contract/ the said Order") with M/s ---------- ---------- [hereinafter called "the said Contractor/Supplier"] for the work of Design, Engineering, Supply, Installation, Testing and Commissioning of total Capacity 17 kWp Grid interactive Solar Photo Voltaic system and associated electrical and Civil works at below mentioned location.

- Location 01: **INDIAN BANK ,TIRUPPUR MAIN BRANCH**

1. Whereas under the terms of the said Agreement/Contract/Order, the Contractor/Supplier is required to furnish a Performance Bank Guarantee for 5% of tendered value i.e Rs. ----------/- (Rs. Amount in words) towards the due fulfilment of the terms and conditions during the agreed time period or extension thereof, and also satisfactory performance of the said equipment supplied to Indian Bank during warranty period as per the warranty terms stipulated in the Agreement / Order.

2. Accordingly, we ----------(name & Address of the issuing Bank) (hereinafter referred to as "The Surety:", which expression shall, unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and permitted Assignees.) at the request of ---------- (name & Address of the contractor) do hereby undertake to pay to Indian Bank an amount not exceeding Rs. ----------/- (Rs. Amount in words) on the failure of Contractor/Supplier in performance of their obligations as per the terms and conditions of the Contract/Order including the satisfactory performance of the item during warranty period as per the warranty terms stipulated in the Agreement / Contract/Order.

3. The Surety do hereby unreservedly, irrevocably undertake to pay the amounts due and payable under this guarantee without any demur, merely on demand from Indian Bank within 10 days of such demand stating that the amount claimed is due by way of breach of terms and conditions of the Agreement/Contract/Order. 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. ----------/- (Rs. Amount in words) and We undertake to pay to Indian Bank a amount not exceeding Rs. ----------/- (Rs. Amount in words) so demanded not

withstanding any dispute or disputes raised by the contractor/supplier of the equipment in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this guarantee being absolute and unequivocal.

The Surety further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/Order and that it shall continue to be enforceable till all the dues of Indian Bank under or by virtue of the said Contract/Order have been fully paid and its claims satisfied or discharged or till Indian Bank certifies that the terms and conditions of the said Agreement/Contract/Order have been fully and properly carried out by the said Contractor/supplier(s) and accordingly discharges this guarantee.

4. The Surety further agree with Indian Bank that Indian Bank shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor/Supplier of the equipment from time to time or to postpone for any time or from time to time any of the powers exercisable by Indian Bank against the said contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contract/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/ Supplier or for any forbearance,

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act or omission on the part of Indian Bank or any indulgence by Indian Bank to the said Contractor/Supplier 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. The Surety lastly undertake not to revoke this guarantee during its currency except with the previous consent of Indian Bank in writing and agree that any change in the constitution of the said contractor/Supplier or the said Bank shall not discharge the Bank of its liability under this deed.

The validity of Bank Guarantee shall be up to DD/MM/YY

And such date shall cover the period of warranty of all the supplies and excludes the period of defect liability. The Bank Guarantee shall remain valid for the period up to which the contractor is obliged for due performance of the said Agreement/ Contract/Order including the warranty period.

6. This Bank Guarantee shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

All the claims under this guarantee must be presented to the bank.

7. Notwithstanding anything contained hereinbefore.

Our liability under this guarantee is restricted to Rs. ----------/- (Rs. Amount in words) .The guarantee is valid up to DD/MM/YY or extension thereof.

Unless a claim or demand made in writing is presented to us on or before DD/MM/YY , the date of expiry of this guarantee all your rights under this guarantee shall be lapsed and we shall be released and discharged from all liabilities there under.

In witness where of the Bank through its officials has set its hand and stamp on ---day of ---------- and the year---------- at ----------.

SIGNED AND DELIVERED for and on behalf of

For and on behalf of above named Bank. (Banker's Name and Seal)
Branch Manager

(Banker's seal)

SEAL OF THE BANK

APPENDIX – VI

PROFORMA

'E'STRUCTURE AND ORGANISATION

1. Name and address of the applicant –

2. Telephone No./Fax No/E-Mail address –

3. Legal Status (attach copies of original document defining the legal status)

   a) An Individual

   b) A proprietary Firm

   c) A Firm in partnership

   d) A Limited Company of Corporation

   e) MSME registered company

4. Particulars of registration with various Government Bodies (Attach attested photo-copy)
a) Registration Number
b) Organization/Place of registration
c) Validity

5. Names and Titles of Directors and Officers with designation to be concerned with this work with Designation of individuals authorized to act for the organization

6. Was the applicant ever required to suspend the work for a period of more than six months continuously after you commenced the work? If so, give the name of the project and give reasons thereof.

7. Has the applicant or any constituent partner in case of partnership firm/Company ever abandoned the awarded work before its completion? If so, give the name of the project and give reasons thereof.

8. Has the applicant or any constituent partner in case of partnership firm/Company ever been debarred /black listed for tendering in any organization at any time? If so, give details:

9. Has the applicant or any constituent partner in case of partnership firm, or any directors in case of a Company ever been convicted by a court of law? Or any criminal proceedings presently pending? If so, give details.

10. Any other information considered necessary but not included above.

SIGNATURE OF APPLICANT(S)

BRIEF SCOPE OF WORK

1) The contractor shall Design, Engineering, Supply, Installation, Testing and Commissioning of Total Capacity 17 kWp Grid Interactive Solar Photo Voltaic system at below mentioned Indian Bank own premises: -

- Location 01: **INDIAN BANK ,TIRUPPUR MAIN BRANCH**

2) The contractor shall also obtain necessary clearances/approvals for installation of Total Capacity 17 kWp) grid interactive solar power plant from the competent authorities. The copy of the approvals, certificates has to be submitted to the Employer. The contractor is responsible to obtain the necessary clearances/approvals for installation/operation of Total Capacity 17 kWp grid interactive solar power plant and also for power purchase/sale from the competent authorities, if required. Liaisoning for getting all mandatory approval pertaining to subsidy / Net metering etc.

3) The solar panel shall be installed at a suitable height and the entire arrangement shall withstand wind speed of 180 KmpH

4) The structure and solar panel drawings with weight shall be vetted by Bank/ Consultant / Engineer-In-charge/Employer before installation of solar power plant. The contractor shall not damage the existing water proofing done on the roof while installation of support structures of solar power plant. They have to get prior approval for the civil works that has to be carried out for support structures at terrace of building from Bank / Engineer-In-charge/ Bank. In case of any damage done to the water proofing and detect leakage due to the same, the contractor will be responsible to rectify the same at their cost to the full satisfaction of the bank.

5) Solar Power plant Single line diagram/ General Arrangement / technical documents / civil drawings / Support structures / Cable race way layout including installation details shall be approved by the Bank / Engineer-In-charge/ Employer before installation of solar power plant.

6) The contractor shall visit the site, understand the site logistics and access the *actual requirement before submitting tender.*

7) The complete electrical system arrangement, installation, including laying of cables / wiring, installation of support structures, civil works shall be done in consultation with Bank / Engineer-In-charge/ Bank's Engineer in charge.

8) A copy of SLD, GA, Circuit diagrams, drawings of civil works shall be submitted to the Bank / Engineer-In-charge/ Bank at the time of installation.

9) The complete setup from design, engineering, supply, erection and commissioning including grid connectivity and Operation & Maintenance of Solar PV System is under contractor's scope.

10) Suitable Energy meter with time totalizer shall be supplied and installed as directed by Bank / Engineer-In-charge / Employer as per specification given in the tender to monitor the daily generation.

11) The operation & maintenance of Solar Photovoltaic Power Plant for a period of **05** years (in addition to DLP period of one year) would include wear, tear, overhauling, machine breakdown, insurance, and replacement of defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts as per warranties & guarantees given in the tender.

12) During the O&M Period (in addition to DLP period of one year) the bidder shall carryout the O&M work as detailed in the Clause 17 of Technical specification.

13) The contractor shall make necessary arrangements to safe guard and maintain the solar power plant from seasonal changes, thefts, etc. for the entire AMC (O&M) period.

14) Contractor will comply with all the IE Rules. 1956, Indian Electricity Act. 2003 and regarding the work of repairs and maintenance

15) The bidder is completely responsible for preparation of drawings etc, site survey before submitting the bid and after award of contract (successful bidder).

इंडियन बैंक INDIAN BANK
ZONAL OFFICE
TIRUPPUR
641602
अंचल कार्यालय

TECHNICAL SPECIFICATIONS FOR EQUIPMENTS

Outline scheme of the project for 01 No of Location:

i. The array capacity of the proposed grid connected PV (Photo Voltaic) power plant shall be total capacity of 17 kWp at Indian Bank – Tirupur Main Branch.

ii. PV array should be installed as per the site condition and supported by concrete blocks to be prepared at site. The installation is at Indian Bank own premises Zonal Office Tiruppur.

iii. The power plant shall be connected to the existing (Bank) HT/LT system through the grid tie string inverter of suitable capacity (as mention in the Technical Specification) and with output voltage of 415V 3-phase, 50 HZ AC. *This Inverter may also be used for future expansion of the power plant.*

iv. The inverters shall be located in the electrical room as directed by the Engineer in-charge.

v. The output of the grid tie inverters is to be terminated to a power evacuation panel (ACDB) which shall be fixed at suitable place.

vi. The output of ACDB will be connected to a 1no. 32A/64 Amps/100Amps (as mention in the Technical Specification) 4P MCCB with suitable enclosure (under scope of contract) fixed near the Invertor/Main EB Board at the supply mains and its associated termination with EB Mains.

vii. The energy meter (02 nos.) of suitable current rating will be fixed as per local electrical norms. Same shall be followed at different locations (2 sites)

viii. The SPV power plant to be installed should be robust, economic, efficient and type tested.

2.0 Solar PV Modules

The cell of the modules shall be Monocrystalline PERC of Minimum 540Wp or higher Rated panels. The PV modules shall qualify IEC-61215 or IS-14286 and IEC-61730 and should be certified under ISO 9001: 2008 & ISO 14001 or equivalent BIS standard and must have test certificates issued from accredited test laboratories of MNRE (Ministry of new and renewable energy). Test certificates issued by IEC accredited laboratories are also acceptable. The proposed PV modules shall be manufactured in India and included in the ALMM List published by MNRE.

If higher capacity Solar Power Panel (540 Wp or more) is used, the quantity of solar panels should be such that the total power output (16.74 kWp) is maintained.

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

Sl No	Standard	Description
1	IEC: 61215	Crystalline silicon terrestrial photovoltaic modules – Design qualification and type approval
2	IEC: 61730 – I:2007	Photovoltaic module safety qualification – Requirement for Construction
3	IEC: 61730 – II:2007	Photovoltaic module safety qualification – Requirement for testing
4	IEC 61701	Salt mist corrosion test of the module
5	IEC 61853	Photovoltaic (PV) module performance testing and energy rating

Module efficiency shall be 19% or more at STC. (Measured at standard test conditions of solar radiation at 1000 W per sq meter at 25 deg. Celsius, spectrum AM 1.5)

Each PV module used in this project must use an RF (Radio frequency) identification tag. The information must be mentioned in the RFID tag used in each module as per guide lines of MNRE which must be inside the laminate and able to withstand harsh environment condition.

The quantity of solar panels should be such that the total power output (16.74 kWp) is maintained. The bidder offering single module with highest wattage shall be given preference provided all other criteria are equal.

Technical specification of the PV Module shall include but not limited to the following:

Sl.No:	Item	Description
1.0	Certification	i) IEC 61215 or IS 14286 ii) IEC 61730& latest IEC/IS norms.
1.1	Test certificate issuing authority	NABL/ IEC Accredited Testing Laboratories or MNRE accredited test centres (preferably the latest).
2.0	**PV cell**	
2.1	Type	Mono crystalline
2.2	Panel Dimensions	2272 mm(L) x 1133 mm (W) x 35 mm (T)/ As per Manufacturers recommendation
3.0	PV Module	
3.1	Rating at STC	540 Wp, 144 cells (without any negative tolerance)
3.2	Module Efficiency	Greater than 20 %.
3.3	Fill Factor	Greater than 70 %
3.4	Withstanding voltage	1500 V DC
3.5	Solar Cell Type & Size	Mono PERC, 91 x 182 mm.
3.6	Encapsulate	PID free & UV resistant
3.7	Front Glass	3.2 mm Low Iron (minimum) & Tempered glass with ARC coating. High transmission, low iron, tampered & textured glass with anti reflective coating.
3.8	Junction Box (Protection degree)/ material	IP 68 rated/Weatherproof PPO.
3.9	Cable & Connector (Protection degree)/ type	IP 68 rated/MC4 compatible.
4.0	Frame	Anodized Aluminium Alloy
4.1	Thermal Characteristics – Operating Temperature range (C)	-40 to 85
4.2	Series Fuse rating	25 Amps
4.3	Product	The solar panel supplied to be the latest & with the most recent technology.

3.0 PV Array

Specification of the PV Array shall include but not limited to the following:

S.No	Item	Description
1	Nominal Capacity	17 kWp
2	PV Module interconnection connector	MC – 4
3	PV Module interconnection cable and array cable	PV 1-F standard / NEC standard " USE-2 or RHW-2" type (double insulated)
4	PV array String Voltage	Compatible with the MPPT Channel of the inverter
5	Number of Parallel String against each MPPT Channel	02 Nos (Maximum) / As Specified by manufacturer.

4.0Module / Array Mounting Structure

i. PV array shall be installed on the GI channel supports resting on the Concrete blocks on the terrace floor.

ii. PV array mounting channel shall be GI with combination of either I, C, L or as per structural design requirement. The structure shall be capable of withstanding a wind load of 180 Km/Hr after installation. (Structural design document to be submitted by the contractor.)

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iii. The weight of the metallic part of the PV module.

iv. Structure shall be corrosion resistant and electrically compatible with the materials used in the module frame, fasteners, nuts and bolts.

v. The mounting channel shall be made of hot dip galvanized MS structure of minimum galvanizing thickness of 120 microns (Test certificate to be submitted by the contractor from standard testing lab to prove the thickness of galvanization).

vi. The channel shall be supplied complete with all members to be compatible for allowing easy installation.

vii. The module mounting channel shall have to be designed and fabricated with optimum tilting angle considering the site condition.

viii. The channel shall have to be designed for simple mechanical and electrical installation. It shall support solar photo Voltaic modules at a given orientation, absorb and transfer the mechanical loads to the building structure.

ix. All fasteners for supporting conduits, nuts and bolts shall be stainless steel of grade SS – 314. The same shall be supported on concrete blocks. No drilling on the terrace floor is allowed.

x. The module mounting structure shall have to be adequately protected against climate condition. The array support shall support SPV modules at a given orientation and absorb and transfer the mechanical load to the building properly.

xi. The channel shall be designed for simple mechanical and electrical installation. There are no requirement of welding or complex machinery at the installation site.

xii. The specification of GI section shall be as per IS-808.

xiii. The supplier shall specify the installation details of the PV modules and the support structures with appropriate design and drawings.

Standards applicable for Structures shall be the Mounting steel structure: BIS 2062 (amended up to date) Galvanisation of mounting structure: BIS 4759 (amended up to date).

Photovoltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, and other adverse conditions. The modules will be fixed on structures with fixed arrangement. The module mounting structures shall have adequate strength and appropriate design suitable to the locations which can withstand the load and high wind velocities.

The mechanical structure shall be made up of hot – dip galvanized steel and designed to withstand gusts of wind / cyclonic wind up to 140 km/hr from back side of the panel. Stationary structures shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.

Wind Velocity withstanding capacity	140 km/hr (wind speed as specified in IS 875 Part 3)
Structure material	Hot dip Galvanized Steel with galvanization thickness as per BIS specifications 2062 & 4759. Minimum Galvanization thickness shall be of 80 microns.
Bolts, Nuts, fasteners, panel mounting clamps	Stainless Steel SS 304 or above
Mounting arrangement for RCC flat roofs Minimum distance between ground level and lower edge of PV panel	With fixed type concrete ballast 0.3 m
Access for panel cleaning and maintenance	Panel top and bottom shall be accessible for cleaning and from the bottom for access to the module junction box

Panel Tilt angle	North South Orientation with a fixed tilt angle of 10 – 13 degrees (depending on location) facing true south

The array will be installed on steel racking structures that are anchored in the ground. Racks will be laid out in parallel matrices allowing for individuals to access the area between the racks for cleaning and other maintenance needs. In between the row of solar panels sufficient gap need to be provided to avoid falling of shadow of previous row on the next row. Seismic factors for the site will be considered while making the design of the foundation.

Array support structure shall be fabricated using corrosion resistant GI or anodized aluminium or equivalent metal sections electrically compatible with the structural material. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.

4.1 **Mechanical Specifications:**

i. The tilt angle of the SPV panels shall be 10-13-degree latitude to the horizontal surface facing true south direction. However, the module alignment & tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided based on the location of array installation and bidder shall clearly indicate the details in the Technical Bid.
ii. The min. Clearance between lower edge of PV panel and terrace ground level shall be 300 mm. (to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace). The minimum height should be increased according to the site conditions for each Roof Top.
iii. In between the row of solar panels sufficient gap need to be provided to avoid falling of shadow of previous row on the next row. Seismic factors for the site will be considered while making the design of the foundation.
iv. The height of each PV panel structure shall not exceed 3m above the terrace level.
v. The PV array structure design shall be appropriate with a factor of safety of min 1.5.
vi. Array support structure shall be fabricated using corrosion resistant GI.
vii. Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.
viii. The support structure shall be free from corrosion when installed.
ix. PV modules shall be secured to support structure using Stainless Steel screw fasteners and / or metal clamps. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners / clamps shall be adequately treated to resist corrosion.
x. The support structure shall withstand wind loading of up to 140 km/hr. Photo – voltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, hail and other adverse conditions. Stationary structures shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the roof properly. Adequate spacing shall be provided between any two modules secured on PV panel for improved wind resistance.
xi. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
xii. It is required to design the grid structure (on which PV module will be installed) in such a way that all load is transferred to the existing columns of the builidngs. Structure design should be provided for the same.
xiii. The bidder shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings. The drawings along with detailed structure design and material selected and their standards should be submitted before starting the execution work.
xiv. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost.
xv. The grid structure should be installed in a manner to leave sufficient space for repair and maintenance of the rooftops, particularly for leakages. The rooftop structure shall not be altered for foundation structures and on any instance of damage to rooftop shall be rectified by the contractor at own expense.
xvi. Installation of grid structure for solar PV mounting should not tamper with the water proofing of roofs if provided.

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5.0 String Combiner box or Array Junction Boxes:

Array Junction Box (AJB) shall have to be used for termination of string prior connecting array with

inverter. There shall be two Arrays Junction Box incase, the inverter is located elsewhere away from PV array. The desired specification of the PV Array Junction Box and accessories shall include but not limited to the following:

S.No	Item Description	Desired Data
1.0	Enclosure	
1.1	Degree of Protection	IP65 with UV Protected
1.2	Material	Polycarbonate
1.3	Withstanding Voltage	1000V DC
1.4	Withstanding Temperature	100^0 C
1.5	Accessories mounting arrangement	DIN Rail
1.6	Number of Strings entry	As may be required
2.0	Cable Entry and Exit	
2.1	Position	Bottom at cable entry and exit
2.2	Cable Entry and Exit connector type	MC 4 Connector (PV Array String Cable)
2.3	Cable gland	Earthing cable entry
3.0	Surge Protecting Device (SPD)	
3.1	Type	DC
3.2	Approved Make	OBO Betterman / ABB / Legrand
3.3	Protection Class	Type B+C
3.4	Number of Set	As may be required as per string Design
3.5	System Voltage	Matched with System Voltage 1000 V DC
4.0	Fuse with fuse holder	
4.1	Position	Positive and Negative terminal for each series string
4.2	Type	Glass fuse, for PV Use only
4.3	Rating	Current: Minimum 1.25 times the rated short circuit current of the string Voltage: Minimum 1000 V DC

a) The String combiner box / Array junction box shall be dust, vermin, and waterproof and made of FRP / ABS Plastic. The terminal will be connected to copper bus – bar arrangement of proper size to be provided. The Junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. 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.

b) The String combiner box / Array junction box shall be with protection class IP 65 for mounting outside in Open weather condition.

c) Each string combiner box / junction box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600 / 1000V with suitable arrangement for its connecting.

d) The string combiner box / Array Junction box will also have suitable surge protection devide. The Surge Protective Device shall be of Type 2 as per IEC 60364 – 5 -53.

e) The junction Boxes shall have suitable arrangement for the following (typical):

- Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
- Provide arrangement for disconnection for each of the groups.
- Provide a test point for each sub – group for quick fault location

f) The current carrying ratings of the string combiner box / Array junction box shall be suitable with adequate safety factor, to inter connect the Solar PV array.

g) The string combiner box / Array junction boxes shall conform to IEC 60529 (Degrees of Protection provided by Enclosures (IP Code)).

6.0 Grid Connected Inverter

The solar grid inverter converts the DC power of the solar PV modules to grid compatible AC power. The power generated from PV array shall be fed to the MPPT Tracker of

Three phase grid tied solar string inverter of nominal capacity as per the individual solar PV system capacity through array junction box.

The proposed 17 kWp Plants shall be connected with the grid. As such, the inverters shall be compatible to operate with existing utility supply. The PV system shall comprise of 20 KVA (or higher 1 Nos) Solar Invertor.

Specification of inverter shall include but not limited to the following:

Sl.No	Operating Parameter	Desired specification
1.0	Type	Grid Connected String Inverter
2.0	Usage	Specially used for PV system
3.0	Standards	
3.1	Efficiency Measurement	IEC 61683 / Equivalent BIS Std.
3.2	Environmental testing	IEC 60068-2 (1,2,14,30) / Equivalent BIS Std.
3.3	Interfacing with utility grid	IEC 61727
3.4	Islanding Prevention Measurement	IEC 62116
3.5	Type Test certificate issuing authority (for item no 3.1, 3.2, 3.3 & 3.4)	NABL / IEC Accredited Testing Laboratories or MNRE approved test centers.
4.0	Input (DC)	
4.1	PV array connectivity capacity	20 kWp
4.2	MPPT Voltage range	Compatible with the array voltage
4.3	Number of MPPT Channel	2 no (Minimum)
5.0	Output (AC)	
5.1	Nominal AC Power output	20 kWp
5.2	Number of Grip Ph	3
5.3	Adjustable AC voltage range	Programmable as per grid condition 360V – 455V
5.4	Frequency range	47 – 53 Hz
5.5	AC wave form	Sine Wave
5.6	THD	Less than 3%
5.7	Switching	High frequency transformer / transformer less
6.0	General Electrical data	
6.1	Efficiency (Maximum)	>= 95%
6.2	Sleep mode consumption	Less than 5 W
7.0	Protection	
7.1	DC Side	1. Reverse-polarity protection 2. Reverse current to PV array protection, over voltage, Under voltage protection 3. Over current
7.2	AC Side	1. DC inject protection to grid less than 1% 2. Over Voltage and Under Voltage 3. Over Current 4. Over and under grid frequency protection 5. Anti-Islanding protection

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7.3	Isolation Switch	1. PV array Isolation Switch(DC)
7.4	Ground fault detection which can detect changes in ground current. Rating shall be as suitable for inverter	To be provided for transformer less inverter
8.0	Display	
8.1	Display type	LCD Display
8.2	Display Parameter	
8.2.1	DC	Voltage Current Power
8.2.2	On grid connected mode	Line status Grid voltage Grid frequency Export Power Cumulative Export Energy
9.0	Interface (Communication protocol)	Suitable port must be provided in the inverter for i) On site upgrade of Software ii) On site dumping data from the memory iii) Web based remote monitoring system
10.0	Web monitoring	Matched with the monitoring and data logging system
11.0	Mechanical Data	
11.1	Protection Class	IP 65 or higher
11.2	Operating ambient temperature	0^0 C to 60^0 C
11.3	Cooling	Natural / forced cooling

7.0 Web enable on line data logger and Remote Monitoring Unit

Web enable data logging system may be an integrated part of the inverter or a separate unit. The data logging system includes **MPPT wise PV array monitoring** system also. The data Logger should have the provision of recording **the data of solar insolation (the amount of solar radiation reaching in a given area), PV cell temperature and ambient temperature and associated electrical parameters** at different stages to study performance of system as well as to study status of the system at a particular instant. The data logger should have required transducer to monitor and record the required system data. **The data logger should be provided with an insolation sensor and a module temperature sensor, ambient temperature sensor matched with the system**.

The data logger shall have reliable battery backup and data storage capacity (minimum two days' data) to record all sorts of data simultaneously round the clock. Web based Remote Monitoring system must be compatible with data logger.

The Web based monitoring system should have the provision of graphical representation of the data shall include but not limited to the following:

7.a – Web based monitoring system:

Sl. No.	Operating Parameter	Desired specification PV
1.0	Input data	Power PV Energy
2.0	Meteorological data	Insolation Module Temperature Ambient Temperature
3.0	Output data	
3.1	Inverter	Export Power Export energy

8.0 ACDB Panel

Output of the Inverter shall be terminated in ACDB Panel (indoor wall mounting type) through 32/63/100 Amps 415V 4 pole MCCB at the incoming side (inverter side). The outgoing side (Grid side) shall be connected to the spare feeder available in the Main MV panel at the basement through 32/63/100 Amps 415V 4 pole MCCB. The set of AC surge suppressor (Surge protection Device) shall be connected at the outgoing bus.

9.0 Energy Meter: (As per TNERC Order No: 03 dated 25/03/2019)

Two nos of Energy Meters to be installed. One is for measuring solar power generation and the other is to measure import and export of energy. The First Meter, Solar Generation Meter shall be placed after the invertor at the ground floor of the premises to facilitate easy access for meter reading. The Second meter shall be bi-directional meter which will replace the existing meter at the branch and used for commercial settlement of energy imported and exported. The First and second meter will have to be installed at the same location where existing meter for recording consumption of energy is installed.

Liasoning with the local Electricity Board for procurement and installation of Energy Meters at the site to be done by the contractor only (as per Price Bid (SINo:13)).

The Contractor is wholly responsible for liaisoning with the local Electricity Board during the calibration, testing & commissioning of energy meters procured by them as per the Technical Specifications. The liaisoning rates shall be quoted in the Price Bid (Sl No:13).

10.0 Cables & Wirings:

- Cables: All cables shall be supplied conforming to IEC 60227/ IS 694 & IEC 60502/ IS 1554 Voltage rating: 1,100V AC, 1,500V DC
- For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; Multi - core cables shall not be used.
- For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible Aluminium cables shall be used, Outdoor Ac cables shall have a UV – stabilized outer sheath.
- All LT XLPE cables shall conform to IS: 7098 part I & II
- The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%
- The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%.
- The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm.
- Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers.
- All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermos-plastic clamps at intervals not exceeding 50cm; The minimum DC cables size shall be 4.0 mm2 copper; The minimum AC cable size shall be 4.0mm2 copper. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires.
- The following colour code shall be used for cable wires and shall confirm to IEC 69947 DC positive: red (the outer PVC sheath can be black with a red line marking)
- DC negative: black AC single phase: Phase: red; neutral: black AC three phase: phases: red, yellow, blue; neutral: black Earth wires: green.
- Cables and Conduits that have to pass through walls or ceilings shall be taken through PVC pipe sleeve.
- Cable conductors shall be terminated with tinned copper end ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and Ac cables at the Solar Grid

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Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.

- Bending radii for cables shall be as per manufactures recommendations and IS: 1255. Cables shall also conform to IEC 60189 for test and measuring methods.
- For laying / termination of cables latest BIS/IEC Codes/standards shall be followed.

The Specification of wiring material of PV Power plant shall include but not limited to the following

Sl. No	Item	Description
A	DC Cable	
1.1	Conductor	Tinned annealed stranded flexible copper according to IEC 60228 class 5
1.2	Standard	PV-1F / 2 PfG 1169/08.2007 / VDE Standard E PV 01:2008-02/ Equivalent
1.3	Make	KEI, Polycab, Havells or equivalent
B	AC Cable	
2.1	Rated Voltage	1.1kV
2.2	Construction	
2.2.1	Type	Armored or unarmoured as per requirement
2.2.2	Conductor	Stranded Flexible Copper
2.2.3	Insulation	PVC
2.2.5	Standard	IS : 1554 – 1
2.3	Make	RR Cable / Polycab / LAPP / Havell's
C	PVC Conduit tees, bends etc (Hard & flexible)	
3.0	Standard	ASTM D 1785 u PVC
3.1	Ambient Temperature	0^0 C to 50^0 C
3.2	Type	UV stabilized, temperatures, Shock proof chemical resistant
3.3	Make	Oriplast / Supreme or equivalent
D	GI Pipe	
2.0	Make	TATA B class

Notes:

(i) All the Array Junction Boxes shall be located at the rear side of the solar array.

(ii) The equipment / structure of the equipment fixed on the array structure then suitable insulation must be provided between Array structure and the equipment and equipment structure.

(iii) The minimum clearance of the lower edge of the equipments from the developed ground level shall be maintained as standard practice.

11.0 Earthing System, Equipment, Array structure

i. Array Structure must be earthed with GI Strip / Aluminium or Copper conductors as per Norms stipulated by the Electrical Inspectorate and conforming to IS - 3043

ii. The complete earthing system shall be electrically connected to provide return to earth from all equipment independent of mechanical connection.

iii. The equipment grounding wire shall be connected to one grounding electrode per PV power plant.

iv. Test point shall be provided for each earth pit.

v. An earth bus and a test point shall be provided inside the room / location where we are installing the inverter and combiner panel.

vi. Earthing system design should be as per the standard practices and conforming IS-3043.

vii. The earth electrode shall be as per relevant standard

viii. The Code of Practice Earthing shall be IS 3043:1987

ix. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.

x. Minimum four (04) numbers of earth pits. Earthing Pit Cover Needs to be provided. The Resistance value of each Earth pit should be submitted.

xi. Earth Grid must be made by inter connection of earth pit through GI Strip. The size of the GI earth strip must be minimum **25 x 3 mm**. The thickness of the galvanization should not be less than 610gr/M2.

12.0 Lightning Protection

The Building is not provided with Lightning protection. Hence new lightning protection shall be installed to protect the building and the solar panels / modules from lightning as per relevant IS Standard. Design shall be submitted for approval before installation

- The SPV power plant should be provided with lightning and over voltage protection.
- The entire space occupying SPV array shall be suitably protected against lightning by deploying required number of lightning arresters. Lightning protection should be provided as per IEC 62305.
- The protection against induced high voltages shall be provided by the use of surge protection devices (SPDs) and the earthing terminal of the SPD shall be connected to the earth through the earthing system.
- Surge protection shall be provided on the DC side and AC side of the solar system.
- The DC surge protection device shall be installed in the DC distribution box adjacent to the solar grid inverter.
- The AC surge protection devices shall be in the AC distribution box.
- The source of over voltage can be lightning or other atmospheric disturbance. The lightning conductors shall be made as per applicable Indian Standards in order to protect the entire array yard from lightning strike.

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13.0 Signage:

Safety Signage: Safety Signage must be provided mentioning the level and type of voltage and symbols as per IE Rule at different position as may be required.

The Solar PV System Caution Stickers shall be fixed in the following locations.

(a) On the Main LT Panel were the solar power is terminated.
(b) Near PV Modules / Junction Box / Combiner panel / Inverter / Soar Generation Meter.
(c) And signage at locations as per the requirement of KSEB

The above stickers shall be non-corrosive caution label with the following text:

WARNING – DUAL POWER SOURCE

The size of the caution label shall be min of 105mm (width) x 20mm (height) with white letters on a red background.

14.0 Provision for Module Cleaning

Module Cleaning: Necessary arrangement and equipment is to be provided to facilitate easy cleaning of the PV Modules

15.0 Fire Buckets and Fire Bucket holding stand

Fire Bucket of minimum quantity eight (08) numbers and Fire Bucket Stand of minimum quantity two (02) shall be provided at Array field. Each fire Bucket holding stand (Triangular type) shall have the arrangement to hold four (04) numbers of fire buckets. The Fire Bucket stand must be as per IS 2546. The stand shall be installed at the rare side of the PV Array. The minimum technical specification is a follows:

Bis Specification	IS 2546
Fire Bucket Capacity	10 Litres
Fire Bucket Body Material	Galvanized Mild Steel Sheet
Body Thickness	1 mm

15a Fire Extinguisher:

A 2.5 KG dry powder fire extinguisher shall be provided in the lift machine room where the inverter and ACDB will be installed. The same shall be mounted to the wall and suitable brackets.

15b Rubber Mat:

A Rubber mat as per IS – 15623 -2006 with thickness of 2mm and tested for 3.3 KV shall be spread in front of the inverter and ACDB.

16.0 Spares, Tools and Measuring Instruments:

The minimum number and different type of spares, tools and measuring instruments must be supplied under this project within the contract value. Also any special tools, spares, measuring instruments if required as may be shall be provided by the contractor within the contract value.

17.0 Operation and Maintenance (O&M)

i. Cleaning of solar modules with soft water, wet and dry mops: Monthly once (Yearly 12 Times). The Solar Panels to be cleaned monthly once as per the instructions of Banks Engineer. (The signed (Bank /Contractor) service report should be submitted monthly to Banks Engineer).
ii. DC String / Array and AC Inverter monitoring: Continuous and computerized.
iii. AC Energy monitoring: Continuous and computerized.
iv. Visual Inspection of the plant: As and when required. (Monthly once)
v. Functional Checks of Protection Components and Switchgear: Monthly once.
vi. Inverter, transformer, data acquisition, energy meters and power evacuation checks: Monthly once.
vii. Support structure and terrace water-proofing checks: Monthly Once.
viii. O & M log sheet shall be provided and maintained: Continuous and computerized.
ix. The repair/replacement work shall be completed within 72 hours from the time of identification / reporting of the fault.
x. A Monthly performance report of the plant inclusive of energy generation data shall be provided.
xi. All recorded data (monthly & yearly) shall be preserved in both manual and computer format and submitted for the first 5 years (in addition to DLP).

18.0 Warranties and Guarantees

Warranties and Guarantees		
1	Solar Modules	10 years free replacement guarantee against material defect or craftsmanship
2	Solar Modules	90% power output for 10 years and 80% power output for 25 years
3	Inverter	Workmanship/product replacement - 5 years, service - 25 years
4	PV Array Installation	Structural -25 years
5	Balance of System / Plant – Parts and workmanship	Parts and Workmanship – 10years, service – 25 years
6	Power Evacuation and Metering Equipment	Workmanship / product replacement – 10 years, service- 25 years

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19.0 Standards

Standards	
IEC 60364-7-712 - Electrical Installations of Buildings	Requirements for Solar PV power supply systems
IEC 61727 or similar	Utility Interface Standard for PV power plants > 10 kW
IEC 62103, 62109 and 62040 (UL 1741)	Safety of Static Inverters - Mechanical and Electrical safety aspects
IEC 62116	Testing procedure of Islanding Prevention Methods for Utility-Interactive PV Inverters
PV Modules	IEC 61730 - Safety qualification testing, IEC 61701 - Operation in corrosive atmosphere
IEC 61215	Crystalline Silicon PV Modules qualification
String/Array junction boxes	IP65, Protection Class II, IEC 60439-1, 3
DC/AC distribution boxes	Rated for IP54
Static Watt Hour Meter (AC)	IS 13779-1999
Central Inverter	Rated for IP54
Surge Protection Devices	Type 2, DC 1000V rated
PV Module/string/string combiner box interconnects	MC4 compatible. DC 1000V rated
All DC and AC cables, conduits, cable trays, hardware	Relevant IS
Earthing System	Relevant IS
PV Array support structure	Relevant IS
Lightning Protection	Relevant IS

APPROVED MAKES

SNo:	Description	Make of material
01	Solar PV panels	Warre/ Emmvee / HHV / TATA / Adani / REC /Sun Power /Panasonic/Trina Solar/Bosch/Q Cells./Vikram Solar.
02	Solar inverter	Delta/ABB/Schneider/ Growatt.
03	Array Junction box	Hensel/Spelsberg/ABB/Cooper busman.
04	ACDB panel	Local fabrication approved by Consultant/Engineer-In-charge
05	MCB / MCCB	Legrand/ Schneider/Siemens/ L&T
06	Armoured cables 1.1 KV	Polycab/KEI/Havells/ RR Kabel/Finolex.
07	Energy Meter	L&T/Siemens/Schneider/Secure/HPL
08	Surge protection	OBO Betterman/ ABB/ Legrand
09	PV module interconnecting Connector	Tyco/ Cooper busman/Nordid
10	PVC Conduit tees, bends etc (Hard &flexible)	Oriplast /Supreme
11	Cables and Wires for AC	RR Cable/ Polycab/LAPP/ Havell's
12	Cables and Wires for DC	LAPP/Top Solar / Nexans / Siechem.
13	Surge Protecting Device (SPD)	OBO Betterman / ABB/ Legrand
14	GI Pipe	TATA-B class- 3 mm thick.
15	Lightning Arrestors	Indelec / Star / Erico
16	Data logging System	Delta/ABB/Schneider/Growatt.
17	Fire Extinguisher	Alert / Tyco / Minimax / Newage / Ceasefire

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18	Indication lamps LED type, Pushbutton	Schneider electric, L&T, Siemens, Vaishno
19	Fasteners	Hilti / Fisher
20	Paints	ICI/Asian / Berger / Kansai Nerolac

GUARANTEED TECHNICAL PARTICULARS (GTP)

(to be completely filled and submitted along with technical bid)

PV MODULE (GTP)

Sl. No	Item	Specification (as per tender)	AS OFFERED
1	Certification	i) IEC 61215 or IS 14286	
		ii) IEC 61730	
1.1	Test certificate issuing authority.	NABL/ IEC Accredited Testing Laboratories or MNRE accredited test centers (preferably the latest).	
2	PV Cell		
2.1	Type	Mono crystalline	
2.2	Size	156mm x 156mm	
3	PV Module 3.1		
	Rating at STC	540Wp, 7144 cells (without any negative tolerance)	
3.2	Efficiency	Minimum14%	
3.3	Fill factor	Minimum 70%	
3.4	Withstanding voltage	1000V DC	
3.5	Glass	Toughened	
3.5.1	Thickness	3.2 mm (minimum)	
3.5.2	Type	High transmission, low iron, tampered & textured glass with anti-reflective coating.	
3.6	PV Module Junction Box		
3.6.1	Protection level	IP 65 or above	
3.7	Bypass Diode		
3.7.1	System Voltage (Vsys)	1000 V dc	
3.7.2	Number	3 numbers	
3.8	Module Frame	Anodized aluminum frame	
3.8.1	Type		
4	**PV Module: MAKE offered**	As per make of material	

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PV ARRAY (GTP)

For 17 kWp Solar Power Plant:

Sl. No	Item	Specification (AS PER TENDER)	AS OFFERED
1	Nominal Capacity	17 kWp	
2	PV Module interconnection connector	MC-4	
3	PV Module interconnection cable and array cable	PV 1-F standard /NEC standard "USE-2 or RHW-2" type (double insulated)	
4	PV array String Voltage	Compatible with the MPPT Channel of the inverter	
5	Number of Parallel String against each MPPT Channel	03 Nos	

PV ARRAY JUNCTION BOX (GTP)

S.No	Item Description	Specification(As per Tender)	As Offered
1	Enclosure		
1.1	Degree of Protection	IP 65 with UV protected	
1.2	Material	Polycorbonate	
1.3	Withstanding voltage	1500V DC	
1.4	Withstanding Temperature	100^0 C	
1.5	Accessories mounting arrangement	DIN Rail	
1.6	Number of Strings entry	As may be required	
1.7	Approved make	Hensel / Spelsberg / ABB / Cooper busman or Equivalent	
2	Cable Entry and Exit		
2.1	Position	Bottom at cable entry and exit	
2.2	Cable Entry and Exit connector type	MC 4 Connector (PV Array String cable)	
2.3	Cable gland	Earthing cable entry	
3	Surge Protecting Device (SPD)		
3.1	Type	DC	
3.2	Approved make	OBO Betterman / ABB / Legrand or Equivalent	
3.3	Protection class	Type 2	
3.4	Number of set	As may be required as per string Design	
3.5	System Voltage	Matched with System Voltage 1500 V DC	
4	Fuse with fuse holder		
4.1	Position	Positive and Negative terminal for each series string	
4.2	Type	Glass fuse, for PV use only	
4.3	Rating	Current: Minimum 1.25 times the rated short circuit current of the string Voltage: Minimum 1500 V DC.	

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GRID CONNECTED INVERTER (GTP)

C) 20 KVA INVERTOR:

S.No	Operating Parameter	Specification (As per Tender)	As Offered
1	Type	Grid connected String Inverter	
2	Usage	Specially used for PV system	
3	Standards		
3.1	Efficiency Measurement	IEC 61683 / Equivalent BIS Std.	
3.2	Environmental testing	IEC 60068 – 2 (1,2, 14,30) / Equivalent BIS Std.	
3.3	Interfacing with utility grid	IEC 61727	
3.4	Islanding Prevention Measurement	IEC 62116	
3.5	Type Test certificate issuing authority (for item no 3.1, 3.2 3.3 & 3.4)	NABL / IEC Accredited Testing Laboratories or MNRE approved Test centers.	
4	Input(DC)		
4.1	PV array connectivity capacity	17 kWp	
4.2	MPPT Voltage range	Compatible with the array voltage	
4.3	Number of MPPT channel	3 nos (minimum)	
5	Output (AC)		
5.1	Nominal AC Power Output	1 kVA	
5.2	Number of Grid Ph	3	
5.3	Adjustable AC voltage range	Programmable as per grid condition 360V – 455V	
5.4	Frequency range	47-53 Hz	
5.5	AC wave form	Sine wave	
5.6	THD	Less than 3%	
5.7	Switching	High frequency transformer / transformer less	
6	General Electrical data		
6.1	Efficiency (Maximum)	95%	
6.2	Sleep mode consumption	Less than 5%	
7	Protection		
7.1	DC side	1. Reverse – polarity protection 2. Reverse current to PV array protection, over voltage, under voltage protection 3. Over current	
7.2	AC side	1. DC inject protection to grid less than 1% 2. Over voltage and Under voltage 3. Over current 4. Over and under grid frequency protection 5. Anti-islanding protection	
7.3	Isolation Switch	1. PV array Isolation switch (DC)	
7.4	Ground fault detection device (RCD) which can detect changes in ground current. Rating shall be as suitable for inverter	To be provided for transformer less inverter	
8	Display		
8.1	Display type	LCD Display	
8.2	Display parameter		
8.2.1	DC	Voltage Current Power	
8.2.2	On grid connected mode	Line Status Grid voltage Grid frequency	

		Export Power Cumulative Export Energy	
9	Interface (Communication Protocol)	Suitable port must be provided in the inverter for i) On site upgrade of Software ii) On site dumping data from the memory iii) Web based remote monitoring system	
10	Web monitoring	Matched with the monitoring and data logging system	
11	Mechanical Data		
11.1	Protection Class	IP 65 or higher	
11.2	Operating ambient temperature	0^0 C to 60^0 C	
11.3	Cooling	Natural / forced cooling	
12	MAKE offered		

WEB BASED REMOTE MONITORING SYSTEM (GTP)

S.No	Operating Parameter	Specification (As per Tender)	As Offered
1	Input Data	PV Power PV Energy	
2	Meteorological Data	Insolation Ambient Temperature	
3	Output Data		
3.1	Inverter	Export Power Export Energy	

CABLES & WIRINGS (GTP)

Sl. No	Description	Specification (As per Tender)	As Offered
A	DC Cable		
1.1	Conductor	Tinned annealed stranded flexible copper according to IEC 60228 class 5	
1.2	Standard	PV – 1F / 2 PfG 1169/ 08.2007/ VDE Standard E PV 01:2008-02/ Equivalent	
1.3	Make	LAPP / Top Solar / Nexans / Schneider or Equivalent	
B	AC Cable		
2.1	Rated Voltage	1.1kV	
2.2	Construction		
2.2.1	Type	Armoured or unarmoured as per requirement	
2.2.2	Conductor	Stranded flexible copper	
2.2.3	Insulation	PVC	
2.2.5	Standard	IS: 1554- 1	
2.3	Make	RR Cable / Polycab / LAPP / Havell's or equivalent	
C	PVC Conduit tees, bends etc (Hard & flexible)		
3	Standard	ASTM D 1785 u PVC	
3.1	Ambient Temperature	0^0 C to 50^0 C	
3.2	Type	UV stabilized, temperatures, Shock proof chemical resistant	
3.3	Make D	Oriplast,/ Supreme or equivalent	
	GI Pipe		
	Make		

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ADDITIONAL SPECIAL TERMS AND CONDITION

1.0 Field Proven Inverter

The proposed string inverter must be field proven in Indian atmosphere. The string inverter of the proposed manufacturer must be used in any project in India and in operation on or before 31st December 2022. Also there must be a good maintenance setup of the proposed inverter manufacturer with having sufficient numbers of qualified service engineers (Degree / Diploma engineers) and well equipped set up with instruments, tools and tackles at Tamil Nadu or Chennai city. The maintenance setup of the proposed inverter manufacturer may be inspected by authority, if required.

2.0 Equipment and Material

Equipment and material shall comply with description, rating, type and size as detailed in this specification. Equipment and materials furnished shall be complete and operative in all respect.All accessories, which are necessary for safe and satisfactory installation and operation of the equipment, shall be furnished. All parts shall be made accurately to standard gauges so as to facilitate replacement and repair. All corresponding parts of similar equipment shall be interchangeable. Contractor shall carefully check the available space and the environmental conditions for installation of all equipments available at site and shall design the system accordingly.

3.0 Mode of Execution

The PV power plant shall be procured as a complete package. The entire work shall have to be executed on **turnkey basis.**

4.0 Materials and Workmanship

Qualified, experienced people should be deployed to install the **PV Power Plant**. All materials shall be of the best quality and workmanship capable of satisfactory operation under the operating and prevailing climatic conditions of respective. Unless otherwise specified, they shall conform in all respect to the latest edition of the relevant code and standards. The project must be supervised by a qualified Civil Structural Engineer/ Engineering firm and Electrical /Electronics Engineer so that the work shall be as per drawing and related IS/IEC Code. The work shall be performed confirming safety precaution of all level of worker execute the project. The name and the qualification of the project engineers must be submitted to authority after placement of order. **The qualification of the supervising engineers must be minimum diploma or degreed in respective stream.**

5.0 Testing and Inspection

- Material Inspection will be carried out after submission of all test reports /certificates and after completion of the manufacturing work, against formal intimation from the contractor. The contractor shall, give notice of any material being ready for testing and the authority Bank / Engineer-In-charge/ bank, if desired, shall attend at the contractor's premises and may proceed with the routine tests. The material shall have to be dispatched at site after inspection and clearance from the purchaser. The inspection setup and instruments must be provided by the contractor within the contract value. The necessary charges for Site Testing, Transportation, accommodation and any other expenses shall be borne by the Contractor only.

Factory Testing:

- **A Factory Test Report (FTR) shall be supplied with the unit after all tests. The FTR shall include detailed description of all parameters tested qualified and warranted. The report must contain measurement of phase currents,**

efficiencies, harmonic content and power factor, also should include all other necessary tests/simulation required. Tests may be performed at 25, 30, 75 and 100 percent of the rated nominal power.

Site Testing:

a. The PCU shall be tested to demonstrate operation of its control system and the ability to be automatically synchronized and connected in parallel with a utility service.

b. Operation of all controls, protective and instrumentation circuits shall be demonstrated by direct test if feasible or by simulation operation conditions for all parameters that cannot be directly tested.

c. Special attention shall be given to demonstration of utility service interface protection circuits and functions, including calibration and functional trip tests of faults and isolation protection equipment.

d. Operation of start-up, disconnect and shutdown controls shall also be tested and demonstrate. Stable operation of the PCU and response to control signals shall also be tested and demonstrated.

6.0 Commissioning

After the erection and testing of the equipment/works as per above, commissioning of the plant and works shall be carried out and here the term "Commissioning" shall mean the activities of functional testing of the complete system after erection and testing, including tuning or adjustment of the equipment for optimum performance and demonstrating to the Purchaser that the equipment performance meets the requirements of the specifications.

7.0 Comprehensive Warrantee and Maintenance

The contractor must ensure that the goods supplied under the contract are new, unused and of most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the contract.

The warranty period **the complete PV Systems** will be **60 (sixty)** calendar months from the date of completion of Defects liability period of **one year** from date of commissioning of plant. The contractor shall remain liable to replace any defective parts that may develop in the plant of his own manufacture or that of his sub-contractors under the conditions provided **for** by the contract under proper use, and arising solely from faulty design, materials or workmanship, provided always that such defective parts as are not, repairable at site and are not essential in the meantime to the maintenance in commercial use of the plant are promptly returned to the contractor's works at the expense of the contractor unless otherwise arranged.

The maintenance includes Routine, Preventive, Breakdown & Capital Maintenance the details are as follows but not limited:

Routine, Preventive, Breakdown & Capital Maintenance:

8.0 Routine and preventive maintenance:

Routine and preventive maintenance shall include cleaning of PV Module on regular basis, checks and maintenance activities such as tightening of all electrical connections, daily, weekly, fortnightly, monthly, quarterly, half yearly, and yearly basis which are required to be carried out on all the components of the power plant to minimize breakdowns and to ensure smooth and trouble free running of the power plant.The supplier shall be responsible to carry out routine and preventive maintenance and replacement of each and every component / equipment of the power plant and he shall provide all labour, material, consumables etc. for routine and preventive maintenance at his own cost.

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9.0 Breakdown maintenance:

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

10.Capital maintenance:

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

The contractor shall under take necessary maintenance/troubleshooting work of the Solar PV Power Systems. Down time shall not be more than 72 working hours from time of occurrence. Adequate measures should be taken for prevention of wear and tear of the machines. Solar PV Power System is to be designed to operate with a minimum of maintenance.

The scope of Support Service provides preventive maintenance as & when necessary within the contract period and break down maintenance in the event of malfunctions, which prevent the operation of the power system or part of it within the stipulated time period & free replacement of spares required for maintenance. Party will provide the A list of Spare parts & measuring instruments are The contractor will submit warrantee certificates of the work & spare parts and materials at the time of submission of completion report. *If any defect is found within the warrantee period, contractor will be liable to repair or replace the same a this own cost and risk, within three (72 hours) days from the date of complaint lodged by the authority or by the user themselves.*

11.0 End Users Training

The Contractor shall arrange for training at site for the end users / employer. The duration of training shall be minimum **five days**. The contractor shall provide training materials at least seven days before commencement of training programme.**The training shall be the part of contract and no extra cost shall be provided for organizing the training programme**.

12.0 Handing Over

The work shall be taken over by authority upon successful completion of all tasks to be performed at site(s) on equipment supplied, installed, erected, commissioned AND RUN SUCCESSFULLY FOR CONSECUTIVE **30 DAYS** AT A STRETCH by the contractor in accordance with provision of this order. During handing over complete project work, the contractor shall submit the followings for considering final payment.

i. All As-Built Drawings & Design
ii. Detailed Engineering Document with detailed specification, schematic drawing,

and test results, manuals for all deliverable major items, Operation, Maintenance & Safety Instruction Manual and other information about the project

iii. Certificate issued by the structural & civil engineer/firm having engineer with minimum LBS/ESE/EBA License for structural design of PV Array.

iv. Bill of Materials

v. Inventory of spares at projects site

vi. Completion certificate as per prescribed format provided by authority

13.0 CEA Inspection

The contractor shall submit all the necessary drawings, SLD etc to CEA / Govt Authorities and arrange for inspection of the installation and obtain their certification. **Rectifications if any pointed out by CEA/CEIG/TEDA/Govt. Authorities in the installed equipments / details shall be carried out by the contractor without any extra claim.**

14.0 Operation & Maintenance (O&M)

The bidder shall be responsible for operation and maintenance of the Roof top Solar PV system for a period of 05 years (in addition to DLP of 1 year).

During this period, the bidder has to **clean the solar panels monthly once** and submit a report to Bank. Care should be taken such that the solar panels are maintained neat and tidy always such that optimum Power Generation is maintained.

15. Metering and Grid Connectivity

Metering and grid connectivity of the roof top solar PV system under this scheme would be the responsibility of the bidder in accordance with the prevailing guidelines of the concerned Distribution Company / KSEB / TNERC / CEA (if available by the time of implementation). Bank could facilitate connectivity; however, the entire responsibility lies with bidder only i.e obtaining clearance / liaisoning etc.

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