NIeT No: WBSEDCL/SPGD/ Revamping 10 MW SPVPP TCF Canal Bank (2nd Call) /2025-26/NIT- 73 Date- 30.05.2025

TENDER DOCUMENT

For

Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, New SCADA system, ESE type LA etc. at TCF Canal Bank 10 MW (AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal.

WBSEDCL

WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED
(A Govt. of West Bengal Enterprise)
Data Centre Complex, Admin Building, 3rd Floor,
AF Block, Action Area-I, New Town, West
Bengal, Kolkata-700163

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BID DETAILS

Sl. No.	ITEM	DETAILS
1	NIeT No.	WBSEDCL/SPGD/ Revamping 10 MW SPVPP TCF Canal Bank (2nd Call) /2025-26/NIT- 73 Date- 30.05.2025
2	Name of work	Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, New SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal.
3	Tender Fee	NIL
4	Estimated Cost of the work (Cost excluding of GST)	2.43 Crore
5	Earnest Money	Rs. 4,86,000 /-
6	Validity of Earnest Money (in case of Bank Guarantee)	06 (six) months from the date of opening of Technical Bid and with a claim period of another 03 (three) months.
7	Date of publishing of NIeT Documents (Online)	04.06.2025 at 02:00 PM
8	Document download start date (Online)	04.06.2025 at 02:30 PM
9	Last Date of submission of queries, if any, for the pre-bid meeting (Only through email)	09.06.2025, 12:00 PM

10	Pre Bid Meeting (Date &Venue)	09.06.2025 at 2:00 PM Office of the Chief Engineer, Solar Power Generation Department (SPGD) 3rdFloor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata–700163
11	Bid proposal submission start date (Online)	10.06.2025 at 04:00 PM
13	Last date & time for submission of bid (Online)	30.06.2025 up to 04:00 PM
14	Last Date and time of physical submission of EMD BG	01.07.2025 UP TO 1:00 PM
15	Date and time of opening of Technical Bid / Part –A (online)	02.07.2025 up to 04:00 PM
16	Date and time of opening of Price Bid / Part-B	To be notified after evaluation of Technical Bids
17	Time of completion of work	180 (One Hundred Eighty) days
18	Validity of offer	180 (One Hundred and Eighty) days from the date of opening of Technical Bid.

PROJECT DETAILS

ITEM	DETAILS
Capacity of the Power Plant	10 MW (AC)
Location	TCFHP PS2, Block – Chopra, Dist. Uttar Dinajpur, WB.
District	Uttar Dinajpur
State	West Bengal
Site Latitude	26.49° N
Site longitude	88.31°E
Nearest Railway Station	NJP/Islampur railway Station. Distance between both the Railway stations and project site is 33.5KM approx.

West Bengal State Electricity Distribution Company Limited
(A Government of West Bengal Enterprise)
CIN: U40109WB2007SGC113473
Solar Power Generation Department
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata – 700 163
Website: www.wbsedcl.in, e-mail: cesolar@wbsedcl.in

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NIeT No: WBSEDCL/SPGD/ Revamping 10 MW SPVPP TCF Canal Bank (2nd Call) /2025-26/NIT- 73 Date- 30.05.2025

NOTICE INVITING e-TENDER

West Bengal State Electricity Distribution Company Limited (WBSEDCL) intends to renovate Teesta Canal Bank 10 MW ground mounted SPVP Plant at TCFHP, Chopra Dist. Uttar Dinajpur of West Bengal. In this connection, the Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL invites e-tender in two parts for the work of **"Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, New SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal "** from bona-fide, resourceful and technically eligible developers having experience in execution of similar nature of work as per eligibility criteria as mentioned below in the form of technical and financial proposals containing as mentioned in the tender document.

The details of Tender and estimated cost: -

Sl. Number	Name of the plant	Total estimated value (INR)(Excluding of GST)
1	10MW SPVPP at TCF Canal Bank, Uttar Dinajpur, West Bengal	**2.43 Crore**

Schedule of Dates for e-Tendering:

Sl. No.	Activity	Date &Time
1	Publishing Date	**04.06.2025 at 02:00 PM**
2	Document Download startdate	**04.06.2025 at 02:30 PM**
3	Last date of submission of queries if any for pre-bid meeting (only through email) within	**09.06.2025, 12:00 PM**
4	Date of Pre-bid Meeting	**09.06.2025 at 2:00 PM**
5	Start date of Bid submission (online)	**10.06.2025 at 04:00 PM**
6	End date of Bid submission (online)	**30.06.2025 up to 04:00 PM**
7	Last Date and time of physical submission of EMD BG	**01.07.2025 UP TO 1:00 PM**
8	Technical Bid opening date	**02.07.2025 up to 04:00 PM**
9	Financial Bid opening date	To be notified after evaluation ofTechnical Bids

Terms & Conditions of the Tender Notice:

1. **Registration of Bidder:** Intending eligible bidders desirous of participating in the tender will have to be enrolled and registered with the Government e-Procurement System and may like to log on to the website https://wbtenders.gov.in for the above tender.
2. **Digital Signature Certificate (DSC):** Bidders willing to take part in the process of e- tendering are required to obtain Class 2 or Class 3 Digital Signature Certificate (DSC) in the name of person who will sign the tender, from any authorized Certifying Authority (CA) under the Controller of Certification Agencies (CCA), Govt. of India. The bidders are required to register the fact of possessing the Digital Signature Certificates through the Registration System available in the website. Tenders shall be submitted online and intending bidders should download the tender documents from the website stated above, directly with the help of the DSC. This is the only mode of collection of tender documents. Details of submission procedure are given in "Instructions to Bidders (ITB)".
3. **Tender Fee:** Not Required.

4. Earnest Money Deposit:

An Earnest money for bidding shall have to be submitted: Rs. 4,86,000 /-

For payment EMD following payment options are available through online mode:

i. Net-banking through Payment Gateway

ii. RTGS/NEFT payment: On selection of RTGS/NEFT as the payment mode, the e-Procurement portal will show a pre-filled challan having the details to process RTGS/NEFT transaction. The bidder will print the challan and use the pre- filled information to make RTGS/NEFT payment using his bank account. Once the payment is made, the bidder will come back to the e-Procurement portal to continue the bidding process after expiry of a reasonable time to enable the RTGS/NEFT process to be completed.

iii. Submission of EMD through BG: For submission of EMD in the form of BG, bidders will have to opt for EMD Exemption in e-tender portal and upload scanned copy of BG in the EMD exemption document upload section. Physical copy of BG shall be submitted at the office of tender inviting authority as per respective clauses of NIT.

EMD amount can be paid either in online mode or submitted through Bank Guarantee (BG) in full. Partial payment through online mode and remaining submission through BG is not allowed.

General Instructions for Online Payment:

- The bidder will have to mandatorily pay through Net-banking facility once Net- banking mode is opted for payment.
- Status of NEFT/RTGS payment through Challan for a bid may take time for bank settlement which is updated in 24 Hrs. (approx.). As such bidders opting to pay through NEFT/RTGS mode shall make payment well before 24 Hrs, to avoid any complicacy.
- The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/c from which the payment of EMD has been initiated.

Refund/Settlement of EMD Amount:

- For unsuccessful bidders, EMD amount submitted against the tender shall be refunded automatically, through an automated process, by NIC portal on receipt of updated status of any bid.
- For successful bidders, EMD will be refunded from WBSEDCL authority after completion of tendering process and following due procedures.
- The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/c from which the payment of EMD has been initiated.

For any queries related to payments and refunds, bidders will have to communicate with ICICI Customer Support, viz, 033-40267512/13 since payment gateway facility used by E-tender portal is maintained by ICICI.

Successful bidder(s) shall have to mandatorily create vendor id through WBSEDCL Web Portal Vendor Corner, if not created earlier.

No interest shall be claimable on Earnest Money Deposit.

5. The Earnest Money as per clause no. 16 of ITB shall be submitted through online payment mode as described above or in the form of Bank Guarantee (BG) on any Scheduled Bank as per Annexed Pro-forma 6 & 13 initially valid for 06 (six) months from the bid submission start date with a claim period of another 03 (three) months and subject to further extension, if required. The bidder shall not claim any interest on Earnest Money Deposit. Earnest Money in any other form or amount will not be accepted. EMD shall have to be submitted as stipulated in ITB. If the offer is submitted without or inadequate Earnest Money, the bid will not be opened. Incomplete offer willbe liable for rejection and Tender Fee Deposits will be forfeited.

6. **Bid Validity:** The Tender and Offer shall remain valid for a minimum period of 180 days from the date of opening of the Technical Bid. However, WBSEDCL, on the merit of the case, may request extension of validity of the offer for a further suitable period without any change in terms & conditions of the original offer.

7. All other information as well as terms and conditions, which are not covered above, will be available in Instructions to Bidders, General Conditions of Contract, Special Conditions of Contract, Technical Specification and specimen Pro-forma of this tender.

8. The bidder or their duly authorized representative should attend the Pre-bid Meeting at the stipulated date and time as mentioned in the Key date's schedule.

9. WBSEDCL is not bound to accept the lowest tender and reserves the right to cancelany or all the tenders unilaterally without assigning any reason what-so-ever. The decision of the Tender Inviting Authority will be final and binding on all concerned and no challenge against such decision will be entertained. In any circumstance, cost of the bidding will not be reimbursed/ returned by the Tender Inviting Authority.

10. **Disqualification of Bidders:** Any evidence of unfair Trade Practices including over charging, price fixing, cartelization etc. as defined in various statutes, will automatically disqualify the bidders.

11. **Amendment of the Bid Documents:** The Tender Inviting Authority reserves the rightto modify, amend or supplement the Tender Document. Any corrigendum, notification concerned to this tender will be published in the e-tender portal https://wbtenders.gov.in and it will be treated as part and parcel of the tender. The bidders are, therefore, advised to follow the website for such corrigendum, notification etc.

12. All the important correspondence must be done through declared authorized email id with original scanned copy of documents/letter in company's letter head/pad. However hard copies should reach our office through post/ by hand from your end.

13. Any further information related to this tender may be had from the following office:

Office of the Chief Engineer
Solar Power Generation Department,
West Bengal State Electricity Distribution Company Limited (WBSEDCL)3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700 163.

Website	: www.wbsedcl.in
Contact Tel. Nos.	: +91 9230961800/02/15/09
Email id	: cesolar@wbsedcl.in

Chief Engineer
Solar Power Generation Department

INSTRUCTION TO BIDDERS (ITB)

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1. NAME OF THE WORK

Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, new SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal

2. REGISTRATION OF CONTRACTOR

Any contractor willing to take part in the process of e-tendering will have to be enrolled and registered with the Government e-Procurement System. Through logging in to https://wbtenders.gov.in, the contractor has to go for the e-Tendering link as given on the web portal.

3. DIGITAL SIGNATURE CERTIFICATE (DSC)

Each contractor is required to obtain Digital Signature Certificate (DSC) for submission of bids from the approved service provider of the National Information's Centre (NIC) on payment of requisite amount. Details are available at the website.

4. TENDER FEE

No fee is applicable for purchasing this tender document for the e-tender.

5. SITE VISIT

The bidders are advised that they must visit the proposed site of installation and get themselves conversant with the actual site condition prior to submission of the bids. The bidder may visit the proposed site during the presence of the officials of WBSEDCL giving prior information in writing or through e-mail to this office.

6. PROCESS TO BE CONFIDENTIAL

6.1 After the public opening of bids information relating to the examination, clarification, evaluation of comparison of Bids and recommendations concerning the award of contract shall not be disclosed to bidders or other person not officially concerned with such process until the Award of the Contract to the successful bidder has been announced.

6.2 Any effort by a bidder to influence WBSEDCL in the process of examination, clarification evaluation and comparison of Bids, and in decisions concerning the Award of contract may result in the rejection of his Bid.

7. ELIGIBILITY CRITERIA FOR PARTICIPATION IN THE BIDDING:

7.1 General

This Invitation for Bids, issued by WBSEDCL is open to sole proprietorship farm/Partnership farm/ LLP and Company (ies) incorporated in India as per Company Act, 1956/2013 (with amendment from time to time), barring those bidders, which have been placed under Holiday Listing and the term/ duration of such listing has not yet expired.

A Bidder shall not have a conflict of interest. Any Bidders found to be having a conflict of interest shall be disqualified. The bidder may be considered to have conflict of interest with one or more parties in this bidding process, if:

i. They have a controlling partner in common,
ii. They receive or have received any direct or indirect subsidy from any of them; or
iii. They have the same legal representative for purpose of this bid; or
iv. They have a relationship with each other, directly or through common third parties, that puts them in position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
v. A bidder submits more than one bid in the bidding process, either individually [including bid submitted as agent / authorized representative on behalf of one or more manufacturer(s) or through Licensee – Licensor route, wherever permitted as per the provision of Qualification requirement for Bidders] or as partner in a joint venture, except for alternative offers permitted under Invitation to Bid. This results in disqualification of all such bids. However, this does not limit the participation of a Bidder as a sub-contractor in another Bid, or of a firm as a sub-contractor in more than one bid; or
vi. A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specification of the materials and services/works that are subject of the bid, or
vii. The Bidder, directly or indirectly shall not be a dependent agency of the WBSEDCL.

This bidding is open to any manufacturer or erector or integrator who provides satisfactory evidence concerning the following that he:

i. is a qualified manufacturer or erector who supply, erect, testing and commission of the type specified and has adequate technical knowledge and practical experience;
ii. does not anticipate change in the ownership during the proposed period of work (if such a change is anticipated, the scope and effect thereof shall be defined);
iii. has adequate financial stability and status to meet the financial obligation pursuant to the scope of the works;
iv. has adequate field services organization to provide the necessary field erection and management services required to successfully erect, test and commission the equipment as required by the Specifications and Documents; and
v. has established quality assurance systems and organization designed to achieve high levels of equipment reliability, both during his manufacturing and field installation activities.

The bidder must submit Certificate of Incorporation/ Registration of Company/Trade license, GST Registration (GSTIN), PAN Card, Labor License, Electrical Contractor License, PF Registration, Employees‟ State Insurance Registration and Professional Tax Registration as per the applicability.

A power of attorney, duly notarized, indicating that the person(s) signing the bid has (ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity.

The above stated requirements are a minimum and WBSEDCL reserves the right to request for any additional information and also reserves the right to reject the Proposal of any Bidder, if in the opinion of Employer, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the Contract.

7.2 Technical Eligibility Criteria

7.2 (a) Experience in execution of any Solar PV Power Project or Solar Project related works or any electrical works under SNA/Govt./SECI/PSU Power Utility/Statutory body/Sub-vendor of any Govt. Solar Projects shall be technical eligibility criteria.

(b) The bidder should furnish documentary evidences of satisfactory performances of the said works/projects by way of submission of completion and performance certificates issued by the purchaser (Plant/Substation Owner) upto the Bid submission Start date.

The certification by the bidder for his own work shall not be acceptable.

(c) Bidder should submit, in support to the above, the list of works/projects completed/commissioned along with their work order/ LOI and the successful commissioning/completion certificates from the purchaser/ employer.

(d) The bidder should submit a list of contracts of similar nature presently under execution giving details of client, completion time, scope and value of work.

(e) A list of key professionals is to be furnished by the bidder as the Project Team Structure for the proposed work mentioning their experience and qualification.

(f) The bidder shall have to possess Electrical Contractors License issued by statutory Authority in Central/State Level. A copy of the License shall have to be uploaded in the specified folder of the e-tender and also to be furnished along with the Bid hard copy.

(g) No Joint venture and no consortium are allowed to participate.

7.3 Financial Eligibility Criteria

(a) The bidder should be a registered company incorporated in India under the Companies Act, 1956 or 2013 (with amendment from time to time) or Partnership Firm registered as per Partnership Act 1932 or Statutory Body or LLP Act 2008 and must submit Trade license, Certificate of Company Incorporation / Registration Certificate, PAN Card, PF Registration, Employees" State Insurance Registration, Professional Tax Enrolment Certificate, GST Registration (GSTIN), Labour License, Electrical Contractor License as per the applicability.

(b) The bidder shall submit reports on the financial standing i.r.o. solvency of bidder company/ firm as certified by bankers, Audit report for companies registered under

Companies Act and Tax Audit report for partnership farms for last 03 (three) Financial Years (2021-22,2022-23, 2023-24)

(c) The bidder shall submit Income Tax Return for the last 03 (three) Assessment Years (2022-23, 2023-24, 2024-25) and latest Income Tax Clearance Certificate from the appropriate authority.

(d) The bidder should have a Minimum Average Annual Turnover @ 30% of the estimated cost of during last 03 (three) consecutive financial years (2021-22, 2022-23, 2023-24) for actual participation in the bidding process.

(e) Bidder shall have Liquid Assets (LA) and/ or evidence of access to or availability of fund-based credit facilities of not less than 10% of the estimated cost of the project and the Banker should confirm that the Credit facility is earmarked for the Work specified under Bid. Liquid assets would include cash (and equivalents), bank deposits, securities that can be freely traded and receivables having age less than 6 month (CA certificate to be provided) which has general certainty of getting received (CA certificate for received up to 6 months).

(f) Net Worth for the each of the last three Financial Years should be positive. Net worth means the sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account for current year) and intangible assets.

(g) The bidder should submit letter of undertakings, evidence of access to or availability of credit/facilities, financial proposal containing Price Bid and Price Break-up as per the Pro-forma given in the tender document.

(h) For the purpose of this particular bid, bidder shall meet the following minimum commercial criteria in past 5 (Five) years up to the Bid submission start date.

i) Experience in **single completed work** of project execution in Solar PV Power Project or Solar Project related works or any electrical works costing not less than the amount equal to **50%** of the estimated amount of the project(s) actually applied for in the bidding process.

Or

ii) Experience in **two completed work** of project execution in Solar PV Power Project or Solar Project related works or any electrical works costing not less than the amount equal to individually **40%** of the estimated amount of the project(s) actually applied for in the bidding process.

Or

iii) Experience in **three completed work** of project execution in Solar PV Power Project or Solar Project related works or any electrical works costing not less than the amount equal to individually **30%** of the estimated amount of the project(s) actually applied for in the bidding process.

8. CLARIFICATION OF BIDDING DOCUMENTS & PRE-BID MEETING

8.1 The bidder shall be deemed to have carefully examined the Bidding Document and also to have been satisfied him as to the nature and character of the system to be supplied and installed against the contract, and all relevant matters & details should there be any discrepancy or, obscurity in the meaning of any of these clauses of the e-Tender documents or if there be any query of the intending Bidder, the Bidder shall set forth such discrepancies, doubt, obscurity or queries and submit the same through our email-id :cesolar@wbsedcl.in or physically at Solar Power Generation Department (SPGD), 3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata – 700 163 at least 24 hours before scheduled Pre-Bid meeting for necessary clarification by WBSEDCL & further action in this regard.

8.2 To assist in the examination evaluation and comparison of Bids, WBSEDCL may ask the bidder individually for a clarification of his Bid including break up of unit rates. The request for clarification and the responses shall be in writing or by cable but no change in the price or substance of the Bid shall be sought, offered or permitted except as required to conform the correction of arithmetical errors discovered by WBSEDCL during the evaluation of the Bids in accordance with clause no. 22 of ITB.

8.3 The Pre-bid meeting will be held on scheduled date and time as mentioned NIeT at the office of the Chief Engineer Solar Power Generation Department (SPGD), 3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata – 700 163.

8.4 Non-attendance at Pre-Bid discussion will not be a cause for disqualification of bidders. The clarification given in the Pre-Bid discussion shall be final and binding on the bidder, being a part the original Bid Documents.

9. DEVIATION

This tender is a 'No Deviation' tender. However, request for any deviation by the bidder (s) vides their queries prior to pre-bid meeting, if tenable, will be informed in the Pre Bid meeting. Proforma 2 shall be filled and submitted by the bidder.

10. AMENDMENT OF BIDDING DOCUMENTS

The Tender Inviting Authority reserves the right to modify, amend or supplement this Tender Document. Any corrigendum, notification concerned to this NIeT will be Published in the e-tender portal https://wbtenders.gov.in. The bidders are advised to follow the website regularly for such corrigendum, notification etc.

11. LANGUAGE OF THE BID

The offer prepared by the bidder and all correspondence and documents relating to the bid exchanged by the bidder and WBSEDCL shall be written in English. The desired documents and any other document submitted by the bidder shall be written in English.

12. PROCEDURE OF SUBMISSION OF BIDS

Bids are to be submitted online through the website https://wbtenders.gov.in. All the documents uploaded by the Tender Inviting Authority form an integral part of the tender document. Bidders are required to upload the entire tender document along with the other required documents through the above website within the stipulated date and time as given in the NIT.

The bid shall comprise of two parts and to be submitted simultaneously – One is Technical Proposal and other is Financial Proposal.

The bidders need to download the documents, fill up the particulars in the designated cell and upload the same in PDF in the designated location of the Technical Bid.

The bidders need to download the Price Bid & Price Break up Pro forma as attached with this document, fill up the same and upload that document in the designated location of the Financial Bid.

All The documents uploaded should be digitally signed using Digital Signature Certificate (DSC). Bidders should take note of all the addendum/corrigendum related to the bid and upload the latest documents as part of the bid.

In addition, a complete set of hard copy except Price Bid maintaining the sequence as per Form-I (Check List) in spiral binding of all the documentary evidences qualifying for their bid, duly stamped and signed by the authorized person of the bidder as uploaded in the website https://wbtenders.gov.in shall have to be submitted along with the hard copy of EMD (Bid Security) with super-scribing of the NIT no., Name of the bidder, Name of the work etc. on the sealed envelope on not before bid submission end date and time.

TECHNICAL PROPOSAL

(A.1) Statutory Cover:

a) To be submitted in "Drafts" folder

i. Tender Fee: NIL

ii. Earnest Money Deposit (EMD):

Scanned copy of the Bank Guarantee against Earnest Money Deposit (EMD),in favour of „WEST BENGAL STATE ELECTRICITY DISTRIBUTION

COMPANY LIMITED" payable at Kolkata or documentary evidence of Online Bank Fund Transfer Statement for deposition of Earnest Money as prescribed in clause no. 16 of ITB.

b) To be submitted in "Annexure" folder

i. Application for Tender *(Vide Proforma – 1)*

c) To be submitted in "NIT" folder

i. Notice Inviting Tender (NIT)
ii. Addenda /Corrigenda/Pre-Bid response (if published) duly signed with stamp.

Note: Bidders are to keep track of all the Addendum / Corrigendum issued with a particular tender and upload all the above digitally signed along with the NIT. Tenders submitted without the Addendum / Corrigendum will be treated as informal and liable to be rejected.

d) To be submitted in "Forms" folder

i. Check List *(Vide Form – I)*
ii. Summary statement of average annual turnover / yearly audit report *(Vide Form – V)* for a period of the last three financial years, certified by the Auditor appointed under Companies Act, 2013. In case the bidder is not a company, certificate of Tax Auditor may be submitted.
iii. Statement of orders executed during last five years *(Vide Form -VI)*
iv. Pro-forma for undertaking to be submitted by the Bidders *(Vide Form – IV)*
v. Format of Letter of Bid *(Vide Form – III)*

(Only downloaded copies of the above documents are to be uploaded, virus scanned and digitally signed by the bidder)

Note: Tenders will be summarily rejected if any item in the statutory cover is missing.

(A.2) Non-Statutory Cover (My Document)

i. Company Details:

- Proof of Company Incorporation / Trade License
- Power of Attorney, duly notarized, indicating that the person(s) signing the bid has (ve) the authority to sign.

ii. Certificates:

1) PAN Card details.
2) Professional Tax (PT) Registration.
3) GST Registration Certificate (GSTIN).
4) PF registration certificate.
5) ESI Certificate.
6) Labour License Certificate.
7) Electrical Contractors License.

iii. Financial Information:

1) Income Tax Return for the last 03 (three) AY
2) Proforma for Evidence of Access to or Availability of Credit / Facilities (*Vide Proforma - 7*)

iv. Credential:

Copy of the Order(s) / LOA (s) / Contract Agreement(s) issued by the purchaser (plant owner), Completion Certificates, Commissioning Reports, and satisfactory performance of the work shall be submitted in support of minimum eligibility criteria as per Clause no. 7 of ITB.

v. Declaration:

1) List of Orders in hand

(The bidder shall submit the list of orders in hand mentioning the order value to be executed within one year from the date of submission of bid)

2) Bill of Material *(Vide Proforma - 6)*

3) List of key personnel available and proposed to be engaged for the project mentioning their experience and qualification

Note:

- Failure of submission of any of the above mentioned document(s) as stated in (A.1) & (A.2) above and as per applicability will render the bid liable to be summarily rejected for both statutory and non-statutory cover.
- The execution of work shall be treated as complete execution of contract, not partial execution of contract.
- The documents uploaded should be digitally signed using the Digital Signature Certificate (DSC).

FINANCIAL PROPOSAL

The financial proposal should contain the following documents in one cover (folder).

Bill of Quantities (BOQ)

The financial proposal will contain Price Bid and Price Break- up respectively in the document. The bidder should fill up the documents by their respective cell and upload given in Pro-forma: 2, Pro-forma: 3 A, Pro-forma: 3 B and Pro-forma: 3 C.

Note:

- The bidder must furnish information in the specified Pro-forma with their offer. If information are not furnished in desired format or in stipulated copies, the offer of respective bidder may be treated as non- responsive and may be considered as ineligible and the bidder shall have no claim whatsoever, on this account.
- The documents uploaded should be digitally signed using the Digital Signature Certificate (DSC).

13. SUBMISSION OF ORIGINAL COPIES OF DOCUMENTS OF EARNESTMONEY DEPOSIT AND HARD COPIES OF UPLOADED DOCUMENTS:

i. **Mode of Payment***:* EMD must be submitted through on-line payment mode as described in Clause no.-16. Payment in any other form will not be accepted.

ii. **Procedure of Submission:** All the documents shall be submitted to the place of submission mentioned below as per following instruction:

- **Envelope 1:** Shall contain Acknowledgement of successful transfer of fund from beneficiary bank or Original copies of Bank Guarantee (BG) as Earnest Money Deposit (EMD) i.e., Form-I (Checklist).
- **Envelope 2:** Shall contain rest of the documents except Price Bid mentioned in the Form-I (Checklist) maintaining proper sequence.

- ❖ **Envelope 3:** Shall contain both the above envelopes mentioning the title on the envelope.

iii. **Place of submission**: The original copies of Acknowledgement or BG, towards Earnest Money shall be submitted in the following office:

Solar Power Generation Department (SPGD), 3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata – 700 163.

Time of submission: The original Bank Guarantee/ Acknowledgement against Earnest Money Deposit (EMD) must be submitted physically at the office of the Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL, under sealed cover super-scribing the name of the work with NIeT no., name of the bidder etc. within the scheduled date & time as specified in the NIT.

If the bidder fails to submit the original copies within the due date and time his tender will not be opened and his bid will be rejected.

14. DISQUALIFICATION / INELIGIBILITY OF BIDDERS

Even though the bidders meet the qualifying criteria, they shall be disqualified if they

- have been involved in the corrupt / fraudulent / collusive / coercive practices and/or,
- have made misleading or false representation(s) in the forms, statements and attachments submitted in proof of the qualification requirements and/or,
- have found to be guilty in formation of cartel for submitting their bids and/or,
- have any Record of poor performance such as abandoning the works, serious litigation history, or financial failures etc. (basis of assessment of suitability shall be decided by WBSEDCL based on the parameters laid down by him on these issues) and/or,
- Have been declared ineligible for poor performance/failure issued by the Govt. of India/State Govt. Dept./PSUs/SNAs and other Statutory Organizations etc.

15. TIME SCHEDULE

The basic consideration and the essence of the Contract shall be the strict adherence to the time schedule specified in the bidding document and incorporated in the contract for the proposed services.

16. EARNEST MONEY

An Earnest money for bidding shall have to be submitted: Rs. 4,86,000 /-

An Earnest money for bidding shall have to be submitted as per following:

For payment of EMD following payment options are available through online mode:

i. Net-banking through Payment Gateway

ii. RTGS/NEFT payment: On selection of RTGS/NEFT as the payment mode, the e - Procurement portal will show a pre-filled challan having the details to process RTGS/NEFT transaction. The bidder will print the challan and use the pre-filled information to make RTGS/NEFT payment using his bank account. Once the payment is made, the bidder will come back to the e- Procurement portal to continue the bidding process after expiry of a reasonable time to enable the RTGS/NEFT process to be completed.

iii. Submission of EMD through BG: For submission of EMD in the form of BG, bidders will have to opt for EMD Exemption in e-tender portal and upload scanned copy of BG in the EMD exemption document upload section. Physical copy of BG shall be submitted at the office of tender inviting authority as per respective clauses of NIT.

EMD amount can be paid either in online mode or submitted through Bank Guarantee (BG) in full. Partial payment through online mode and remaining submission through BG is not allowed.

Bank details for purchasing of BG are given below:

Bank Name: State Bank of India, Bank Branch: Bikash Bhaban G.O.C.,
Account Name: WBSEDCL, Account Number: 36548991592
IFSC Code: SBIN0007816.

General Instructions for Online Payment:

- The bidder will have to mandatorily pay through Net-banking facility once Net-banking mode is opted for payment.
- Status of NEFT/RTGS payment through Challan for a bid may take time for bank settlement which is updated in 24 Hrs. (approx.). As such bidders opting to pay through NEFT/RTGS mode shall make payment well before 24Hrs, to avoid any complicacy.
- The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/c from which the payment of EMD has been initiated.

Refund/Settlement of EMD Amount:

- For unsuccessful bidders, EMD amount submitted against the tender shall be refunded automatically, through an automated process, by NIC portal on receipt of updated status of any bid.
- For successful bidders, EMD will be refunded from WBSEDCL authority after completion of tendering process and following due procedures.
- The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/c from which the payment of EMD has been initiated.

For any queries related to payments and refunds, bidders will have to communicate with ICICI Customer Support, viz, 033-40267512/13 since payment gateway facility used by E-tender portal is maintained by ICICI.
Successful bidder(s) shall have to mandatorily create vendor id through WBSEDCL Web Portal Vendor Corner, if not created earlier.

No interest shall be claimable on Earnest Money Deposit.
The bid security amount (EMD) shall be released to the successful bidder after receiving Performance Security/Contract Performance from the contractor within the stipulated date mentioned in the Letter of Award (LOA). But the EMD of the unsuccessful bidders will be returned within Forty-Five (45) days after finalization of this contract for which a request letter has to be initiated by the concerned unsuccessful bidders to the Chief Engineer Solar Power Generation Department (SPGD), 3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town, Kolkata – 700 163. In case, WBSEDCL cancel the Tender on his own for any reason, the EMD submitted by the bidders will be returned without any interest subsequently, for which a request letter has to be initiated by the authorized tender applicant.

17. FORFEITURE OF EMD

EMD shall be forfeited, if

a) The Bidder modifies/withdraws the Bid after Bid opening and during the period of Bid Validity and/or,

b) The bidder has been found practicing corrupt or fraudulent or collusive or coercive practices during bidding process and/or,

c) The bidder has been found guilty of Formation of Cartel.

d) The successful bidder fails within the specified time limit to Sign the Contract Agreement and/or,

e) The successful bidder fails within the specified time limit to submit the Contract performance/Performance security.

f) The successful bidder fails to submit unconditional Acceptance of LOA within the specified time limit.

18. PERFORMANCE SECURITY/CONTRACT PERFORMANCE

The Successful bidder shall submit a Performance Guarantee within 15 (Fifteen) days from the date of issuance of LOA in the form of Bank Guarantee (PBG) for an amount not less than 10% (ten percent) of the total value of the contracts valid initially for a period of 1 (one) year with a claim period of 03 (three) months and extendable BG 10 % equivalent to quoted rate of Solar Inverter, Solar Module and SCADA system along with its installation upto five years till completion of the warranty period.

The above mentioned PBG shall also cover the guarantee against offered minimum annual generation of the plant upto initial O & M period of 05 (Five) years from the final date of commissioning of the entire plant.
In case of failure of requisite performance in terms of generation on part of the bidder, in either year the relevant penalty clause shall be imposed and the bidder will have to submit full amount of Bank Guarantee covering 10% of the total value of the contracts accordingly

19. FORFEITURE OF PERFORMANCE SECURITY

Performance Security/Contract Performance shall be forfeited if,

a) The successful bidder do not execute the work after placement of Letter of Award (LOA) and/or,

b) The successful bidder discontinue the work without prior permission of the Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL and/or,

c) The successful bidder fails to install/procure the total capacity of the plant as mentioned in the tender document and/or,

d) The contractor fails to submit a fresh BG 30 (thirty) days prior to expiration of the previous BG against performance security of appropriate amount as per the terms and conditions and/or,

e) The successful bidder fails to rectify/replace of the defective/damaged equipment(s)/work(s) within the Defect Liability Period.

f) The contractor fails to perform/neglect the operation and maintenance activity of the plant as per contract.

20. PRICE REVISION

Revision/withdrawal of price bid after opening of Techno–commercial bid will not be entertained, under any circumstances until and unless it is sought for. In case it is asked by the tendering authority, the mode of communication too should strictly be followed by the bidder as specified in Writing by WBSEDCL.

21. VALIDITY OF OFFEER

The offer against tender should remain valid for a minimum period of 180 days from the next day of opening of Technical Bid. However, WBSEDCL may, on the merit of case, request extension of validity of the offer for a further suitable period without any change in terms & conditions of the offer.

22. DETERMINATION OF RESPONSIVENESS

22.1 Prior to be detailed evaluation of Bids, WBSEDCL will determine whether each Bid is substantially responsive to the requirements of the bidding documents.

22.2 For the purposes of this Clause a substantially responsive Bid is one which conforms to all the Terms, Conditions and Specifications of the bidding documents without immaterial deviation or reservation. A material deviation or reservation is one which affected in any substantial way the scope quality or performance of the works, or which limits in any way the responsibilities or liabilities of the Bidders or any right of the Owner as required in the Bidding documents and the rectification of which deviation or reservation would affect unfairly the competitive position of other bidders presenting substantially responsive Bids.

22.3 If a Bids is not substantially responsive to the requirements of the bidding documents it will be rejected by WBSEDCL and may not subsequently be made responsive by the bidder having corrected or withdrawn the nonconforming deviation or reservation.

22.4 Although details presented in this NIeT have been compiled with all reasonable care, it is Bidder‟s responsibility to satisfy itself that the information / documents are adequate and that there is no conflict between various documents / stipulations. No dispute or claims shall be entertained on this account. Bid proposal preparation is the responsibility of the bidder and no relief or consideration can be given for errors and omissions.

23. CORRECTION OF ERRORS

23.1 Bids determined to be subsequently responsive will be checked by WBSEDCL for any arithmetic errors in computation and summation. Errors will be corrected by WBSEDCL as follows:

(a) Where there is discrepancy between amount in figures and in words, the amount in words will govern.

(b) Where there is discrepancy between the unit rate and the total amount derived from the multiplication of the unit rate and the quantity, the unit rate as quoted will govern unless in the opinion of WBSEDCL there is an obviously gross misplacement of the decimal point in the unit rate in which event the total amount as quoted will govern and the unit rate will be corrected.

23.2 The Bidder should ensure that the prices furnished in various price schedules are consistent with each other. In the case of any inconsistency in the prices furnished in the price schedules WBSEDCL shall be entitled to consider the highest price for the purpose of evaluation and use the lowest of the prices in this schedule for the purpose of Letter of Award (LOA).

23.3 The amount stated in the Bid form will be adjusted by WBSEDCL in accordance with the above procedure for the correction of errors and shall be considered as binding upon the Bidder, if the bidder does not accept the corrected amount of Bid, his Bid will be rejected and the Bid Guarantee forfeited.

23.4 In case of any discrepancies between the rate or price as quoted in Pro-forma 2 and corresponding rate or price in Pro-forma 3 A, 3 B and 3 C, then rate or price as quoted or arrived in Pro-forma 3 A, 3 B and 3 C shall prevail and evaluation shall be done accordingly.

24. OPENING AND EVALUATION OF TENDER

24.1 Opening of Technical Proposal

i. Technical proposals will be opened by the Tender Inviting Authority or his authorized representative electronically from the website stated above, using their Digital Signature Certificate.

ii. Technical proposals for those tenders, who's EMD have been received, will only be opened. Proposals corresponding to which original copy of BG/Online transaction receipt towards EMD has not been received, will not be opened and will stand rejected.

iii. Statutory Cover (vide Clause 13.A.1) will be opened first and if found in order, Non-statutory Cover (vide Clause 13.A.2) will be opened. If there is any deficiency in the Statutory Documents, the tender will summarily be rejected.

iv. Decrypted (transformed into readable formats) documents of the Statutory and Non-statutory Covers will be downloaded for the purpose of evaluation.

v. If the information furnished by the bidder in objective manner is not confirmed by the uploaded documents then the bidder will be out rightly rejected for Price Bid opening. The documents related to the furnished online information based on which the evaluation takes place will only be considered. If the bidder uploads any other document, it will be given no cognizance.

24.2 Technical Evaluation of Tender

i. While evaluation, the Tender Inviting Authority or his authorized representative may summon the bidders and seek clarification / information or additional documents or original hardcopy of any of the documents already submitted and if the same cannot be produced within the stipulated time frame, their proposals will be liable for rejection.

ii. The summary list of bidders, whose bids will be found techno- commercially eligible, will be uploaded in the web portals. Date of opening of financial bid will be intimated to the techno-commercially qualified bidders.

24.3 Opening and Evaluation of Financial Proposal

i. Financial proposals of the bidders declared techno-commercially eligible, will be opened electronically by the Tender Inviting Authority from the web portal stated above on the prescribed date.

ii. After opening of the financial proposal the preliminary summary result containing inter-alia, name of bidders and the rates quoted by them will be uploaded.

iii. The Tender Accepting Authority may ask any of the bidders to submit analysis to justify the rate quoted by that bidder.

iv. Bids determined to be subsequently responsive will be checked by WBSEDCL for any arithmetic errors in computation and summation. Errors will be corrected by WBSEDCL as follows:

(a) Where there is discrepancy between amount in figures and in words, the amount in words shall be considered.

(b) Where there is discrepancy between the unit rate and the total amount derived from the multiplication of the unit rate and the quantity, the unit rate as quoted shall be considered.

v. Conditional discounts/ rebates, if any, offered by the bidders shall not be taken in to consideration for evaluation.

vi. The discounted price in Price bid-3C shall be considered for evaluation purpose only and shall have no relation with the contract price. The contract price shall be finalized based on actual rate quoted subject to bid responsiveness and bid correction.

24.4 Revision/withdrawal of Financial Proposal by the bidder after opening of Technical Proposal of the tender will not be allowed if it is not sought by the Tender Inviting Authority.

25. APPLICATION FOR TENDER

The bidder should submit the Application for Tender as per Proforma: 1 attached with this tender document. Not submitting the Proforma will cause for rejection of the respective bid.

26. AWARD CRITERIA

WBSEDCL will accept the lowest valid tender, evaluated based on the Financial Proposals, for awarding of the Contract. However the Tender Accepting Authority does not bind himself to do so and reserves the right to reject any or all the tenders for valid reasons.

27. LETTER OF AWARD

Solar Power Generation Department (SPGD), WBSEDCL will place Letter of Award (LOA) to the successful bidder to convey the decision of the tender inviting authority before the expiration of the period of validity of the offer, if the whole tender is not cancelled/ postponed by the Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL.

The contractor should submit the contract agreement, Bank Guarantee for Performance Security and any other document as desired within the stipulated date as mentioned in the said LOA, failing which the job may subject to be cancelled and EMD of the successful bidder will be forfeited.

Notwithstanding anything stated elsewhere in the bid documents, the Contract to be entered into will be treated as a divisible Supply, Civil construction, Erection & Commissioning Contract.

Award shall be placed on the successful Bidder as follows:

i) **First (1st) Contract:** For Ex-works supply of all equipment and materials including all other services like inland transportation, insurance for delivery at site, unloading, safe storage, handling at site and any other services specified in the Bid Document.

ii) **Second (2nd) Contract:** For installation, testing and commissioning in respect of all the equipment supplied under the "First Contract" and necessary Civil work including any other services specified in the Bid Document.
Both these Contracts will contain interlinking cross-fall breach clause specifying that breach of one Contract will constitute breach of the other Contract.

iii) **Third Contract**-For buy back of materials after installations new one

28. CURRENCIES OF BID

The unit rate and the price of each item given as per the BoQ shall be quoted by bidder only in Indian Rupees.

29. CONTRACT AGREEMENT

The contractor (successful bidder) shall have to be entered into a Contract Agreement within stipulated time as mentioned in the Letter of Award (LOA) with West Bengal State Electricity Distribution Company Limited (WBSEDCL) for the proper fulfillment of the contract as per Proforma: 08. All Documents/ Correspondences relevant to this tender evolved during the tendering process and firming up of the Contract and during execution of the work will form part of the agreement. The successful bidder shall have to submit a copy of the whole tender document duly signed and stamped by the authorized representative of the successful bidder.

30. INDEMNITY BOND

The contractor (successful bidder) shall have to produce Indemnity Bond as per Proforma: 09 within stipulated time as mentioned in the Letter of Award (LOA) to the Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL.

31. RIGHT TO ACCEPT OR REJECT ANY OR ALL OFFERS

The Chief Engineer, Solar Power Generation Department (SPGD), WBSEDCL reserves the right to reject any or all the offers without assigning any reason whatsoever.

If the successful bidder does not enter into Contract Agreement and/or submit the performance security/contract performance and/or Indemnity Bond within stipulated time as mentioned in the Letter of Intimation, his EMD will be forfeited and the job may subject to be cancelled.

32. CONTRACT PRICE

Contract price is quoted price plus applicable GST but inclusive of all other charges.

GENERAL CONDITIONS OF CONTRACT (GCC)

Table of Contents

DEFINITION OF TERMS:

Unless the context otherwise requires, the following terms whenever used in this document have the respective meaning:

i. The **'Company'/'Employer'/'Department'** shall mean the WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD. (WBSEDCL), having its Office at Vidyut Bhavan, Block-DJ, Sector-II, Kolkata – 700091 and shall include its successors and assigns.

ii. The **'Engineer-in-Charge'** shall mean the Engineer designated by the Company for the purpose of this contract. He will authorize the Controlling Officer and Supervising Officer for carrying out the work.

iii. **'Company's representative'** shall mean any person or persons of consulting firm appointed and remunerated by the Company to supervise, inspect, test and examine workmanship and materials of the work under this scope.

iv. The **'Contractor'** shall mean the Bidder who will be awarded with the contract by the Company and shall include the contractor's executor's administrators, successors and permitted assignees.

v. The **'Sub-Contractor'** shall mean the person named in the Contract for any part of the works or any person to whom any part of the contract has been sublet by the contractor with the consent in writing of the Engineer and will include the legal representatives, successors and permitted assigns of such persons.

vi. **'Equipment/materials'** shall mean and include all type of construction equipment & materials etc. required for true and satisfactory completion of the work under this contract.

vii. **'Workmanship'** shall mean the method/manner in which the jobs of the different items, whether included in the schedule or not but are required for true & satisfactory completion of the work under this contract, are executed.

viii. **'General conditions'** shall mean all the clauses of General conditions of the proposed contract stated hereinafter. The specification shall mean the specification annexed to or issued with the General Conditions and shall include the schedule and drawings attached thereto.

ix. The term **'Services'** shall mean all works to be undertaken by the contractor as laid down under the head "scope of work" or elsewhere in the specification enclosed. When the words "approved", "subject to Approval". "As directed", "Accepted", "Permitted" etc. are used, the approval, judgment, direction etc. are understood to be a function of Company.

x. **'Day'** means a calendar day beginning and ending midnight.

xi. **'Month'/'Calendar month'** means not only the period from the first of a particular month, but also any period between a date in a particular month, and the date previous to the corresponding date in subsequent month unless specifically stated otherwise.

xii. **'Week'** means seven consecutive calendar days.

xiii. **'Writing'** shall include any manuscript, type written, printed or other statement reproduced in any visible form.

xiv. The work **'Site'** shall mean the site of proposed work as detailed in the specification or any other place where the work is to be executed under the contract.

xv. **'Date of Commencement'** shall mean the date of actual handing over of site whichever is later.

xvi. **'Date of Completion'** shall mean the date of final completion of the project in all respect.

xvii. **'Specifications'** shall mean collectively all the terms and stipulations contained in this document including the conditions of contract, technical provisions and attachments thereto and list of corrections and amendments.

xviii. **'Drawings'** means collectively all the accompanying general drawings as well as all detailed drawings, which may be used from time to time or desired by WBSEDCL.

xix. **'Approval'** shall mean the written approval of WBSEDCL and/the statutory authorities, wherever such authorities are specified by any codes or otherwise.

xx. **'Manufacturer'** shall refer to the party proposing to design/engineering and construct in complete or in part a particular job/work at their works/premises.

xxi. **'Labourer'** shall mean all categories of labour engaged by the Contractor, his sub-contractors and his piece workers for work in connection with the execution of the worked covered by the specifications. All these labourers will be deemed to be employed primarily by the Contractor.

xxii. **'Plant'/'Equipment'/'Stores'** means and include plant and machineries to be provided under the contract.

xxiii. **'Delivery of Plant'/'Delivery of Equipment'** shall be deemed to take place on delivery of the plant/equipment in accordance with the terms of the contract complete in all respect after approval by WBSEDCL.

xxiv. **'Tests on Completion'** shall mean all such tests as are prescribed by the specification to be made by the Contractor to the satisfaction of WBSEDCL before the plant and equipment are taken over by WBSEDCL and this also includes those tests not specifically mentioned in the specification but required under various BIS codes and relevant Electricity Acts and Rules.

xxv. **'Urgent Works'** shall mean any urgent measures, which in opinion of the Engineer–in-Charge, become necessary at the time of execution and/or during the progress of work to obviate any risk of damage to the structure, or required to accelerate the progress of work or which become necessary for security or for any other/reason WBSEDCL may deem expedient.

1. NAME OF THE WORK

Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, new SCADA, ESE type LA etc. at TCF Canal Bank 10 MW (AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal

2. SCOPE OF WORK

Scope of work includes Design, Engineering, Manufacture/ Procurement, Supply of equipment and materials; testing at manufacturers works, inspection, packing and forwarding, unloading and safe storage at site, associated civil works including site development, services, permits, installation and incidentals, erection, testing and commissioning with Warrantee obligation at Project site. The equipment and materials the Solar PV Power Plant with associated system shall include but not be limited to the following equipment and sub-systems:

a) Contractor shall prepare and submit the Detailed Design Report to WBSEDCL which must contain schedule of site works, detailed specifications of each equipment and works (*as mentioned in the technical specification chapter of the tender document)*, all necessary drawings and associated calculations for selection of different equipment for the plant based on the site location and relevant code of practice.

   The Detailed Design Report shall also contain necessary test certificates and approvals as per relevant standard and practice for all the equipment, catalogues, quality assurance etc.

   Bill of Quantity (BOQ) for each job including tools and spares, quality control procedures on materials & works and other conditions of contract prior to the execution of the work shall also be a part of the Detailed Design Report.

   The contractor needs to submit their Detailed Design Report to WBSEDCL within the time specified in the 'Time Schedule' of the Letter of Award (LOA). The contractor shall submit 03 (three) sets of the Draft Detailed Design/Drawing Report along with editable soft cop in a compact disk for approval.

   After finalization of the same by WBSEDCL, the contractor shall submit six (6) sets of the finalized Detailed Design Report along with editable soft copy in a compact disk to carry out further course of action.

b) The contractor shall supply all materials and equipment required for erection, testing & commissioning of the plant. The supply of materials shall also include transportation, loading and unloading at work site.

c) Timely procurement and transportation to site in properly packed condition of all equipment, materials and miscellaneous item required to complete the project.

d) Contractor shall arrange proper storage at site for the equipment and materials at his own cost and risk. The complete system shall be under the custody of the contractor till successful commissioning and handing over the plant to WBSEDCL. WBSEDCL in no case shall be held responsible for any loss/damage/theft of materials/equipment; so long those shall continue to remain under the custody of the contractor.

e) The contractor shall carry out all necessary civil works to complete the work. Prior to execution of civil works drawing and design shall get approved from WBSEDCL.

f) Installation, testing and commissioning should be done as per the approved time schedule.

g) The contractor needs to submit 03 (three) sets of user's manual and 02 (two) sets of Operation and Maintenance format book suitably useable for 60 months.

h) The contractor shall adhere to safety practices during erection, commissioning and subsequent operation and maintenance of the system including fire prevention.

i) The contractor needs to clean all the debris from the site before final commissioning of the plant.

j) Any other items not specifically mentioned in the technical specification and/ scope of work but which are required for successful completion and satisfactory operation of the solar power plant are deemed to be included in the scope of work/specification.

k) The contractor should submit the total system warranty as per clause no. 23 of GCC in a 100 Rs. Non-judicial Stamp Paper (Pro-forma for the same should be approved by WBSEDCL) duly indemnified at the time of submission of completion report.

3. CONTROLLING OFFICER'S DECISION

Controlling Officer's decision is final in respect of all matters which are left to the decision of the Controlling Officer including the granting or with-holding of certificates.

If, in the opinion of the contractor, a decision made by the Controlling Officer is not in accordance with the meaning and intent of the contract, the contractor may file with the Controlling Officer, within 07 (seven) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as an acceptance of the Controlling Officer's decision and the decision shall become final and binding.

4. COMMENCEMENT & COMPLETION TIME

Date of commencement should be reckoned from the date of issuance of LOA/ date of actual handing over of site whichever is later.

The whole work must be completed within 180 (One hundred eighty) days from the date of commencement.

A detailed time schedule for the site work has to be prepared and submitted by the contractor to the Controlling officer.

All works under the contract must be completed by period of completion mentioned in NIT while portions of work as per program settled in consultation with the Controlling Officer shall be completed by the date stipulated in the said program. It is to be noted that time is the essence of the contract and any default on the part of the contractor to complete the work within the stipulated date/dates aforesaid or within the time as may be extended in writing by the Controlling Officer subject to the payment of liquidated damages, the Company shall have the right, without prejudice to any other clauses, to terminate contract forthwith and to take possession of the balance work/materials and have the same allotted to any other agency and the contractor shall be liable to compensate the loss that may be occasioned to the Company on that account. Any letter in writing by the Controlling Officer shall be treated as conclusive on behalf of the Company.

5. SCHEDULE OF WORK

Before actual commencement of the work, the contractor shall submit a time bound schedule for approval of the Controlling Officer who have the authority to make additional alteration, and substitution of such program including modification and time to time as decided by the department and contractor shall strictly follow such modified schedule for timely completion of the work.

6. VARIATION, ADDITIONS AND OMISSIONS

The Contractor shall not modify the work except under direction in writing by WBSEDCL. WBSEDCL reserves the right to vary the capacity of projects up t o +/ - 10 % (plus or minus ten percent) on pro rata basis. Contract will be executed accordingly on such capacity variation.

However, any item(s) not included in the schedule or specification but required for completion of the work shall have to be carried out/supplied without any extra price. While submitting the offer the bidder shall consider price of those items and may indicate separately as additional deliverable items.

7. CONFIDENTIALITY

The Contractor, or any entity affiliated with the Contractor, shall not disclose to any unauthorized person any information and/or data that may be supplied to him/her by the WBSEDCL or by any other organization, under the directions of the WBSEDCL. All such documents shall be the property of the WBSEDCL or any information that may have come to his/her knowledge directly or indirectly by virtue of the assignment.

8. DEPARTMENTAL MATERIAL

Departmental material shall not be issued to the contractor for the work except under special circumstances.

9. FORCE MAJEURE

Force Majeure means any circumstances beyond the control of the parties, including but not limited to:

a. War and other hostilities, (whether war be declared or not), invasion, act of foreign enemies, requisition or embargo.

b. Rebellion, revolution, insurrection, military power and civil war.

c. Riot, commotion or disorder, except where solely restricted to employees of the Contractor or of his sub-contractors.

d. Earthquake, flood, cyclone and such other natural disaster affecting Contractor's work.

WBSEDCL shall neither be responsible nor be liable to bear any compensation for any interruption of work in the site, except, due to the above force majeure condition.

Upon the occurrence of any situation of Force Majeure, the Contractor shall endeavor to continue to perform his obligations under the Contract so far as reasonably practicable. The Contractor shall notify within a week in written to the controlling officer of the steps he proposes to take including any reasonable

Alternative means for performance which is not prevented by Force Majeure. The Contractor shall not take any such steps unless directed to do so by the controlling officer.

10. EXTENSION OF TIME

An extension of time without imposition of Liquidated Damage (LD), may be granted for delay in execution of work provided there is no fault whatsoever on the part of the contractor. Such extension may only be granted on the basis of application to be submitted within the schedule date of completion by the contractor who has to establish that the extension of time required by him is not due to his fault.

The Contractor may claim an extension of the Time for Completion if he is or will be delayed in completing the Works by any of the following causes:

a. Extra or additional work ordered in writing by WBSEDCL.

b. Suspension of work ordered in writing.

c. Delay by any other Contractor engaged by WBSEDCL, affecting this Contract.

d. Delay in handover of site by WBSEDCL

e. Force Majeure.

The Contractor shall give notice to WBSEDCL of his intention to make a claim for an extension of time within 15 days of the occurrence of any of the above cause(s). The notice shall be followed as soon as possible by the claim with full supporting details. WBSEDCL shall after verification allow the Contractor for updating of the program chart as facts may justify.

11. LIQUIDATED DAMAGE

If the Contractor shall fail to complete the total works within the time prescribed herein or extended time for completion, then the Contractor shall pay to the Company a sum amounting to half percent (0.50%) of the "Contract value of work" as liquidated damages for such delay for every week or part thereof which shall elapse between the time prescribed or extended time as the case may be and the date of completion of the work in each phase, subject to a maximum of ten percent (10%) of the contract price.

The Company may, without prejudice to any, all other method of recovery deducts the amount of such damages from any money in their hand due or which may become due to the contractor. The payment or deduction of such damages shall not relieve the contractor from this obligation to complete the works or from any other of his obligations and liabilities under the contract.

If there is a valid acceptable reason for delay of execution, the Controlling Officer may at his discretion consider lower down of the liquidated damage or even waive the liquidated damage on having written prayer from the contractor along with valid reason.

12. DEFECTIVE MATERIAL

If in the opinion of the Engineer, any of the machineries/equipment/materials etc. brought to the site for use are not of the quality or kind specified in the contract and/or are unfit for the work, he shall be at liberty to order the removal of the said items and the contractor shall remove the same within twenty four (24) hours after notice has been given to him and if he fails to remove them within the time the engineer may cause them to be removed anywhere at the risk of the Contractor and any cost incurred in so doing shall be deducted from the dues to the contractor under the contract. In such case, items as prescribed by the Controlling Officer or his representative are to be substituted immediately.

13. RISK PURCHASE

If the contractor fail, on receipt of the order, to take up the work within reasonable period or leave the work site after partial execution of the work WBSEDCL shall have the liberty to get the work done through other agency at his own risk and additional amount if any. If the situation so warranted to compel WBSEDCL to cancel the order placed on the Contractor, he shall be liable to compensate the loss or damage, which WBSEDCL may sustain due to reasons of failure on his part to execute the work in time.

14. DEFECT LIABILITY PERIOD

The term 'Defect Liability Period' shall mean the period of 05 years (Five years) for Solar Inverters, Solar Modules, SCADA system and 01 year (one year) for other materials from the Date of handing over of the entire project work. If any defect against the new executed work is found within the defect liability period the contractor shall be liable to rectify/replace the materials at their own cost and responsibility.

Defects/rectification work so notified shall have to be attended and completed satisfactorily within the specified date or as deemed justified by the Controlling Officer. For faithful & due fulfillment of all obligations, this defect liability period shall be covered by the performance security/contract performance, already submitted by the contractor.

After completion of defect liability period, and on completion of satisfactory rectification of defects, if any, reported within the defect liability period and on receipt of the application from the contractor and considering other factors as per clause no. 21 of GCC, the Controlling Officer of the work shall recommend for amount of the performance security/contract performance to be submitted by the contractor for the next year.

15. SUBLETTING OF CONTRACT

The contractor shall not, without the written consent of the Company, assign or sublet any part thereof, other than for raw materials, or for any part of the work provided that any such consent shall not relieve the contractor form any obligation, duty or responsibility under the contract. In the event of sub-letting of contract or any part thereof is permitted, the fact that such permission has been accorded shall not establish any contractual relationship between the approved Sub-vendor and WBSEDCL of any of his liabilities and obligations under the contract.

16. NOTICES

Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, Registered post, courier service, facsimile (fax) or Electronic Data Interchange (EDI), e-mail to the address of the relevant party.

Any notice sent by facsimile or EDI shall be confirmed within two (2) days after dispatch by notice sent by airmail post or special courier, except as otherwise specified in the Contract.

Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by airmail or special courier.

Either party may change its postal, cable, telex, facsimile or EDI address or addressee for receipt of such notices by ten (10) days' notice to the other party in writing.

Notices shall be deemed to include any approvals, consents, instructions, orders and certificates to be given under the Contract.

17. WBSEDCL'S RIGHT TO TERMINATE CONTRACT & HOLIDAY LISTING

- If the contractor fails to start the work within a month from the date of issue of the work order, the West Bengal State Electricity Distribution Company Limited shall have the right to cancel the work order with forfeiture of earnest money (Converted into initial security) without giving any notice to the contractor. The contractor may be subjected to holiday listing as per company's policy.

- If the contractor neglects, or fails to proceed with the work proportionate to the scheduled time of completion of the work or fails to complete the work within scheduled time for completion or within the extended time approved by West Bengal State Electricity Distribution Company Limited, the West Bengal State Electricity Distribution Company Limited shall have right to terminate the work order after giving notice in writing to the contractor. If the contractor fails after 14 (fourteen) days of such notice, to

proceed with the work in the manner notified, West Bengal State Electricity Distribution Company Limited shall terminate the contract and call the contractor to take joint measurement along with the Engineer for the finished portion of work. If the contractor does not appear for joint measurement, ex-party measurement by West Bengal State Electricity Distribution Company Limited will be taken as final.

In that case, WBSEDCL shall take possession of the work, site and engage other agency to complete the work. Extra cost, if incurred, to get the unfinished work done through other agency, will be realized from him from his pending bills and security money. In the contract terminated as above, the contractor shall have no claim for compensation against West Bengal State Electricity Distribution Company Limited for any loss or deterioration of any materials that he may have collected or he may have entered into account of the work.

The contractor may be subject to holiday listing as per company's policy.

18. APPROVAL

Design and Drawing: The contractor shall have to prepare and submit the designs and drawings associated with civil, mechanical and electrical work which includes design of foundation, structure cable sizing, fabrication work, layout design, wiring diagram etc. and obtain approval prior to the execution of work and for this purpose the contractor shall submit Detailed Design Report for obtaining approval from WBSEDCL. The contents of the Detailed Design Report shall be as mentioned in the scope of work (Clause no. 2 of GCC).

Testing and Inspection: Any authorized representative of WBSEDCL shall, at all times, have full access to all parts of the site, places from which natural materials are being obtained, during production, manufacture and construction and be entitled to examine, inspect, measure and test materials and workmanship, and check the progress of manufacture of plant and production of materials/equipment at manufacturer's workshop. No such activity shall relieve the Contractor from any obligation or responsibility. 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 to SPGD, WBSEDCL.

The contractor shall arrange for all the necessary tests required for the project in the premises of the contractor or Sub-contractor and provide assistance, labour, materials, electricity, fuel, stores, calibrated apparatus and instruments as may be necessary to carry out the tests efficiently without any extra charges. If the facilities are inadequate to carry out tests as per standard, the contractor shall have to arrange suitable testing place having all such required facilities and the cost towards this will be on contractor's account.

The contractor shall also bear all charges towards travelling expenses of the Inspecting Team of the Purchaser or the authorized representatives of the Outside Inspecting agency consisting of at least two (2) persons for to and fro journey by Air from purchaser's Headquarter, including boarding and lodging at the place of inspection and transit, if any for the purpose of Inspection and Testing.

WBSEDCL, if desired, will visit the contractor's premises/manufacturer's workshop and may proceed with the routine tests. Arrangements for such program shall be done by the contractor. The inspection setup and instruments must be provided by the contractor within the contract value.

The material shall have to be dispatched at site after inspection and clearance from the purchaser.

WBSEDCL, if desired, may test the delivered product (especially solar module) at site from any accredited laboratory of Govt. of India. The result of that test and subsequent decisions taken by the controlling officer will be bound to the contractor.

Rejection: If, as a result of an examination/testing, any plant, materials, design or workmanship is found defective and/or not in accordance with the Contract, WBSEDCL may reject the plant, materials, design or workmanship by giving notice with reasons. The Contractor shall then promptly make good the defect and/or ensure that the rejected/replaced item complies with the Contract.

Materials: Contractor shall obtain prior approval for the materials deliverable under the project from WBSEDCL as mentioned in the technical specification.

19. MODE OF EXECUTION

The PV power plant equipment shall be procured as a complete package. The entire work shall have to be executed on TURNKEY BASIS.

20. SUBMISSION OF PROGRESS REPORT

The contractor shall submit the field progress report weekly to the controlling officer for the work. The contractor needs to get approval of the format of the progress report prior to the execution of the work.

21. INSURANCE

Freight Insurance: The Contractor shall arrange for insurance coverage for the equipment, accessories, materials etc. during transportation & delivery at site till successful handover of the plant.

Execution Insurance: It is desired that the contractor shall arrange for insurance coverage for the equipment, accessories, materials etc. to be delivered at site till successful commissioning of the plant. As such the bidder shall include the price of such insurance in their price bid as part of the price of work.

22. WARRANTY

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 of the Solar Inverters, Solar Modules, SCADA system will be 05 years (Five years) and 01 year (one year) for other materials from the Date of handing over of the entire project work. However, the performance guarantee of the PV Module shall be 25 years as per guideline of Ministry of New and Renewable Energy (MNRE), Government of India.

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 contractor will submit Warrantee Certificates of the work & spare parts and materials in a 100 Rs. Non-judicial Stamp Paper (Pro-forma for the same should be approved by WBSEDCL) duly indemnified 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 at his own cost and risk, within three (72 hours) days from the date of complaint lodged by WBSEDCL.

All the OEM shall sign End User Warranty Agreement directly with WBSEDCL. However, the agency is liable to do all the formalities for Warranty Agreement with End user (WBSEDCL) and claiming the warranty to restore the plant within the stipulated time.

23. PENALTY

Penalty may be imposed to the contractor for any of the following reasons:

a. If the contractor fails to repair/replace any defective material/equipment within the downtime or the time period granted by the controlling officer after receiving such prayer from the contractor in writing, the defects will be repaired by WBSEDCL and the amount will be recovered from the Performance Bank Guarantee which has been deposited to WBSEDCL at the time of starting of the work (equivalent to a sum of amounting to ten percent (10.00%) of the contract value).

24. LABOUR LICENSE

Contractor will have to obtain Labour License in respect of the above work as per Contract Labour (Regulation & Abolition) Act, 1970 as early as possible.

25. PRICE

Price shall be fixed/firm. No escalation shall be paid due to any reason what-so- ever. Price as quoted at column (III) of Proforma 2: Price Bid against Sl. No. 1, 2 & 3 should be equal to amount arrived by aggregating the quoted prices for the respective items in Proforma 3 A – Price Break up for supply of equipment & materials, Proforma 3 B – Price Break Up for Construction, Erection, Testing and Commissioning and Proforma 3 C – Price Break Up for Buy back of materials. In case of any discrepancies between the rate or price as quoted in Proforma 2 and corresponding rates or price in Proforma 3 A, 3 B and 3 C, then rate or price as quoted or arrived in Proforma 3 A, 3 B and 3 C shall prevail and evaluation shall be done accordingly.

Amount of Freight Insurance & Execution Insurance shall be quoted in the Proforma: 3 A – Price Break Up for Supply of Equipment & Materials & Proforma: 3 B - Price Break Up for Construction, Erection, Testing and Commissioning, respectively considering the clause of Insurance under Clause No: 21 of GCC.

Any action on the part of the bidder to revise the price and/or change the structure of price at his own after the opening of the bid may result in rejection of the bid and forfeiture of the earnest money.

Prices shall be quoted and payable in Indian Rupees only.

26. TERMS OF PAYMENT

Payment will be made as per following schedule:

Sl. No.	Work Head	Pattern of Release of Billing Amount
Part A	i. After delivery of the materials/ equipment and safe storage at site.	60% of total amount of materials/equipment supplied as per schedule of the bidder approved by WBSEDCL and the Price Schedule of Pro-forma- 3A, shall be paid on pro-rata basis.
	ii. After installation, necessary testing and commissioning	**30%** of total amount of the Schedule of Prices of Pro- forma- 3A shall be paid on pro-rata basis After installation, necessary testing and commissioning of plant capacity with adjustment of buy back amount (amount of the schedule of prices of Pro-forma 3C).
	iii. After Final completion as well as handover of the project	**Balance** 10% of total amount of the Schedule of Prices of Pro-forma- 3A shall be paid.

Sl. No.	Work Head	Pattern of Release of Billing Amount
Part B	i. After successful installation of the materials/equipment.	60% of total amount of the Schedule of Prices of Pro-forma- 3 B shall be paid on pro-rata basis.
	ii. After successful necessary testing and commissioning of the plant.	30% of the total amount of the schedule of prices of Pro-forma 3B shall be paid
	iii. After Final completion as well as handover of the project.	**Balance 10%** of total amount of the Schedule of Prices of Pro-forma- 3 B shall be paid

All payments will be made to the Contractor under the contract in Indian rupees only.

The contractor shall submit Invoice in triplicate for release of payment to them. Maximum one no of RA bills per month will be accepted from the awarded agency for processing of payment.

Payment against delivery of materials, as mentioned above in Sl. No-Part I, will be released to the contractor for the materials for which delivery instructions would be issued by the authorized officer of WBSEDCL after successful inspection and testing of the materials carried out at the works of the manufacturer. The materials shall be according to the approved bill of materials.

WBSEDCL shall arrange joint inspection and measurement of work by the representatives of WBSEDCL and the contractor, for releasing payments.

27. TAXES, DUTIES, LEVIES

- Basic Customs duty and entry tax (wherever applicable) shall be included in the basic bid price by the bidder.
- GST as applicable will be paid extra as per GST Act, 2017.

Tax invoices need to be issued by the bidder for raising claim under the contract showing separately the tax component (CGST, SGST, IGST, Cess as applicable) in accordance with the provisions of the GST Act, 2017.

28. STATUTORY DEDUCTIONS

All statutory deductions will be made from each RA/Final Bill as per applicability of different laws of the land.

29. HANDING OVER

The work will be taken over by WBSEDCL after final completion of the revamping in all respect. In case of phase-wise commissioning of the plant, the contractor shall have to maintain the same at his risk & cost until handing over of the plant. During handing over the plant, the contractor shall submit the following documents.

i. Completion Certificate including Warrantee Certificates of the work in a 100 Rs. Non-judicial Stamp Paper (Pro-forma for the same should be approved by WBSEDCL) duly indemnified.
ii. Operation & Maintenance Manual and other information about the equipment.
iii. Completion certificate as per prescribed format provided by WBSEDCL.

After submitting all the requisite documents as mentioned above, WBSEDCL will hand

over the plant to the c u r r e n t O & M v e n d o r

30. CERTIFICATE OF COMPLETION OF WORKS

Before taking over the works into commercial use, WBSEDCL will issue a certificate of completion based on the following certifications by the Controlling Officer:

i. Acceptable quality and workmanship of works after Commissioning by the Controlling Officer or his authorized representative.

31. FINAL ACCEPTANCE CERTIFICATES (FAC)

The Controlling Officer will issue Final Acceptance Certificate (FAC) within 30 (Thirty) days from the date of expiration of 5 (Five) years of defect liability period or the date of rectification of deficiencies/damages/ defects, if any, whichever is later.

SPECIAL CONDITIONS OF CONTRACT (SCC)

Table of Contents

1. CODES AND STANDARDS

All equipment and materials to be furnished under this specification shall be designed, manufactured and tested in accordance with the latest editions of the relevant IS/IEC/MNRE guidelines or as applicable.

The electrical installation shall meet the requirement of Indian Electricity Act, and Indian Electricity Rules as amended up-to-date and also the applicable section of the latest revision of the relevant IS Code of Practice.

The work shall be done in compliance with the IS Specifications, International Electro-technical Commission Codes, Indian Electricity Act 2003 and all applicable laws in India.

2. RULES AND REGULATIONS

The contractor shall comply with all the statutory provisions of the following prevailing Labour Laws in respect of employees engaged by them:

- Contract Labour (Regulation and Abolition) Act 1970,
- Payment of Wages Act 1936,
- Minimum Wages Act 1948,
- Payment of Bonus Act 1965 and amended in 2015,
- Employees' Provident Fund and Miscellaneous Provisions Act 1952,
- Employees Compensation Act 1923,
- Employees State Insurance Act 1948.

3. SAFETY

All units with respect to their location, layout, general arrangement and design and equipment, structural design, etc. shall be safe to the personnel and conform to the relevant safety rules and regulations/statutory requirement issued by the State Government and the Central Government as well as to:

i. Indian Electricity Rules 2005
ii. Indian Electricity Act 2003
iii. Indian Explosives Manual and
iv. Fire Protection Manual

The bidder shall also provide necessary fencing and lights to protect the public from accident.

Fire extinguishers shall be kept by the bidder at the site of works where there is risk of fire hazard.

Adequate washing facilities shall be provided near the place of work.

When the work is done near any place where there is risk of drowning, all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of work.

These safety provisions shall be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work spot. The persons responsible for compliance of code shall be named by the bidder.

To ensure effective enforcement of the rules & regulations relating to safety precautions, the arrangement made by the bidder shall be open to inspection by the employer and WBSEDCL.

Notwithstanding the above clauses there is nothing in those to exempt the bidder from the operations of any other Act or Rule in force in the Republic of India.

All storage, handling & use of flammable liquids shall be under the supervision of qualified persons.

First aid arrangements with the degree of hazard and with no. of workers employed shall be maintained in a readily accessible place throughout the whole of working hours.

Reporting of Accident:

All accidents, major or minor, must be reported immediately to WBSEDCL and the contractor will provide first aid to the injured person immediately. The injured person shall report to the First Aid Station along with the 'Injured on work' form as per appropriate Proforma, duly filled in quintuplicate and submit to the Medical Officer of the First Aid Station.

Serious Injuries:

In case of serious injuries, the following procedure shall be adopted by the contractor.

- To provide first aid at his own First Aid Station.
- To take the injured person to the hospital along with the 'Injured on work' form duly filled in.
- To report the accident to WBSEDCL.

Fatal Accident:

Fatal accidents must be reported immediately to WBSEDCL as well as to the Police.

Penalty:

Failure to observe the Safety Rules will make the contractor liable to penalty byway of suspension of work/termination of contract.

Adequate arrangement for proper lighting & guarding shall be made at the worksite.

4. CONSTRUCTION POWER

Contractor has to make his own arrangement of power connections/supply for utilization during construction stage of the project.

5. WATER FOR CONTRACTOR'S USE

The contractor can use the water available at the site for construction purposes and maintaining the plant. However, drinking water has to be arranged by the contractor boring a Tube well of adequate depth and size based on locally available data of the respective department.

6. PACKING

The Contractor shall make separate package for each consignment and mark all containers with the implementing document number pertinent to the shipment. Each shipping container shall also be clearly marked on at least two sides as follows:

a. Consignee
b. Contract No.
c. Package No.
d. Description
e. Item No.
f. Net and gross weight
g. Volume.

7. TRANSPORTATION

The Contractor shall at its own risk and expense transport all the Materials, Plant and Equipment and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the Materials, Plant and Equipment and the Contractor's Equipment.

The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the Plant and Equipment and the Contractor's Equipment to the Site. The Owner shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Owner from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the Plant and Equipment and the Contractor's Equipment to the Site.

Issuance & Submission of Way Bill:

Regarding issuance and submission of e-way bill form, you have to follow the procedure given below:

a) E-way bill has to be generated from your end as per GST Act, 2017.
b) A copy of the same is to be sent to the Senior Manager (F&A), Indirect Tax Cell, WBSEDCL, Vidyut Bhavan, 6th Floor, 'C' Block, through e- mail id: manageridtwbsedcl@gmail.com on the same day of generation of e-way bill.

The utilization report is to be submitted to the Senior Manager (F&A), Indirect Tax Cell, WBSEDCL, Vidyut Bhavan, 6th Floor, 'C' Block within 72 hours from generation of e-way bill.

8. TOOLS & TACKLES

The contractor shall provide all reliable tools & tackles for proper execution of work. WBSEDCL, shall in no way, responsible for supply of any tools & tackles for implementation of the work.

9. ACCIDENT RISK

WBSEDCL shall not be responsible in connection with any sort of accident either fatal or non-fatal which may occur during transportation of materials/equipment, execution/maintenance of works of the PV Power Plant. The Contractor shall have to provide safety precautionary arrangement for his workmen in order to avoid any such incident/accident as per prevalent safety rules and regulations.

10. ROAD PERMITS

In case of procurement of materials for this project outside the state of West Bengal, issuance of Way Bill and Form-C will be taken care by WBSEDCL as per norms.

11. STORAGE AT SITE

The contractor shall provide all necessary storage at the site in specified areas for all materials which are likely to deteriorate by the action of sun, winds, rain or other natural cause due to exposure in the open in such manner that all such materials shall be duly protected from damage by weather or any other cause.

All such stores shall be cleared after completion of the work and the entire site shall be clean and free from debris. All materials shall be stacked in such a manner as to facilitate rapid and easy checking of such materials.

12. REPLACEMENT OF DEFECTIVE PLANT OR MATERIALS

If during the progress of the work the Purchaser's Representative shall decide and notify in writing to the Contractor that the Contractor has executed any unsound or imperfect work or has supplied any plant inferior in quality to that specified, the contractor, on receiving details of such defects or deficiency shall, at his own expense, within such time as may be reasonably necessary for making it good, proceed to alter, reconstruct or remove such work, or supply fresh materials up to the standard of the specification, and in case the Contractor shall fail so to do, the purchaser may, on giving the Contractor 10 (Ten) days' notice in writing of his intention so to do, proceed to remove the work complained of, and at the cost of the Contractor, perform all such works or supply all such materials, provided that nothing in this clause shall be deemed to deprive the purchaser of or affect any rights under the Contract which he may otherwise have in respect of such defects or deficiencies.

13. EQUIPMENT AND MATERIAL

Equipment and material shall comply with description, rating, type and size as detailed in the technical 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 in the BOQ.

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 equipment available at site and shall design the system accordingly.

Materials brought to the site shall not be removed from the site without the written consent of the WBSEDCL. The contractor shall submit well in advance for approval of samples, specimens as the WBSEDCL may demand from time to time. Any material brought to the site and rejected by the WBSEDCL shall be removed by the contractor from the site of work immediately.

All materials including reinforcing steel, cement for concrete work, sanitary, plumbing & carpentry fittings etc. shall be procured after approval of brand and make by WBSEDCL.

14. MATERIALS AND WORKMANSHIP

Qualified, experienced people should be deployed to install the PV Power Plant. All materials shall be of the best quality and capable of satisfactory operation under the operating and prevailing climatic conditions. 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 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 WBSEDCL after placement of order. The qualification of the supervising engineers must have degree in respective stream.

15. TESTING AND INSPECTION

Any authorized representative of WBSEDCL shall, at all times, have full access to all parts of the site, places from which natural materials are being obtained, during production, manufacture and construction and be entitled to examine, inspect, measure and test materials and workmanship, and check the progress of manufacture of plant and production of materials/equipment at manufacturer's workshop. No such activity shall relieve the Contractor from any obligation or responsibility.

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 to Solar Power Generation Department, WBSEDCL.

The contractor shall arrange for all the necessary tests required for the project in the premises of the contractor or Sub-contractor and provide assistance, labour, materials, electricity, fuel, stores, apparatus and instruments as may be necessary to carry out the tests efficiently without any extra charges. If the facilities are inadequate to carry out tests as per standard, the contractor shall have to arrange suitable testing place having all such required facilities and the cost towards this will be on contractor's account.

The contractor shall also bear all charges towards travelling expenses of the Inspecting Team of the Purchaser or the authorized representatives of the Outside Inspecting agency consisting of at least two (2) persons for to and fro journey by Air from purchaser's Headquarter, including boarding and lodging at the place of inspection and transit, if any for the purpose of Inspection and Testing.

WBSEDCL, if desired, will visit the contractor's premises/manufacturer's workshop and may proceed with the routine tests. Arrangements for such program shall be done by the contractor. The inspection setup and instruments must be provided by the contractor within the contract value.

The material shall have to be dispatched at site after inspection and clearance from the purchaser.

WBSEDCL, if desired, may test the delivered product (especially solar module) at site from any accredited laboratory of Govt. of India. The result of that test and subsequent decisions taken by the controlling officer will be bound to the contractor.

If during inspection at the contractor's or sub-contractor's, the offered material or equipment are not found in entire offered quantity or found in a part quantity or without any identification mark, the offer will be termed as "Fake Offer". The owner in that case shall ask the contractor to deposit a sum of Rs 50,000/- as penal measure. However, the referred material/equipment shall be inspected further on receipt of re-offer as well as deposition of specific amount, as above to the owner by the contractor.

16. REJECTION

If, as a result of an examination/testing, any plant, materials, design or workmanship is found defective and/or not in accordance with the Contract, WBSEDCL may reject the plant, materials, design or workmanship by giving notice with reasons. The Contractor shall then promptly make good the defect and/or ensure that the rejected/replaced item complies with the Contract.

If WBSEDCL requires this plant, materials, design or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause WBSEDCL to incur additional costs, the Contractor shall subject to pay these costs to WBSEDCL.

17. ROYALTIES

The Contractor shall pay all royalties, rents and other payments for: i. Natural Materials obtained from outside the Site and ii. The disposal of material from demolitions and excavations and of other surplus material (natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

18. SUPPLEMENTARY/EXTRA WORKS

Whenever supplementary/extra items of work become unavoidable for completion of the work in all respect, the Contractor shall bring the matter to the notice of the Controlling Officer and submit their proposal. However, the controlling officers shall have the right to advise the contractor to proceed with such item (s) of work. Rates for supplementary items shall be arrived at as given hereunder:

19.1 The rates of all supplementary items shall be decided on pro-rata basis from the existing items in the contract.

19.2 When above clause no 19.1 shall not be applicable the rates shall be taken from P.W.D. (WB) schedule of rates for building works, sanitary & plumbing works effective from 01.07.2014 including addenda and corrigenda published up to date of bid opening subject to plus/minus the contractual rate of quotation.

19.3 When clause no 19.1 & 19.2 above shall not be applicable, the rates should be analyzed, to the mutual acceptance from present market rates of different elements involved in the item, against documentary evidence, with 5% overhead, contractor's profit as 10% and 1% cess towards BOCWWC Act,1996. In that case contractual rate of quotation will not be applicable.

Controlling Officer's decision regarding finalization of rate of non-scheduled item(s) shall be final and binding upon the contractors.

19. 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 owner that the equipment performance meets the requirements of the specifications.

The contractor needs to submit the time schedule for the site work with their detailed design report considering the above factors.

20. DISPUTES

The parties shall take necessary steps to settle any dispute through amicable mutual discussion with issuing prior notice in writing to other side at least 15 (Fifteen) days in advance.

21. JURISDICTIONAL MATTER

If such disputes did not get resolved then either party may approach court of law. All litigation matters between the parties if any shall be held in any Court in Kolkata under the superintendence of High Court Calcutta.

22. ACCOMMODATION

The accommodation of the contractor′s Engineers and workers at the site is to be arranged by the contractor. WBSEDCL may arrange the same upon availability of at the nearest field hostel in chargeable basis after receiving request letter from the contractor.

23. NIGHT AND HOLIDAY WORK

None of the permanent work related to contract shall be carried out during the night or Sunday or on other holiday of WBSEDCL without permission in writing of the Controlling Officer of WBSEDCL.

24. SURVEILLANCE

The contractor shall in connection with the works provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary or required by the WBSEDCL or by any competent authority or statutory or other authority for the protection of the works or for the safety and convenience of the public or others.

25. CLEARING SITE ON COMPLETION

On completion of the works the contractor shall clear away any and remove from the site all constructional plant, surplus materials, rubbish, debris and temporary works of every kind and leave the whole of the site and works clean and in a good and tidy condition to the satisfaction of the Controlling Officer of WBSEDCL.

The contractor shall dismantle and remove the staging and other temporary structures like stores, offices, labour camps etc. on completion of work, clear and clean the site where such temporary facilities were built and restore the same to original condition.

26. TRAINING FOR WBSEDCL PERSONNEL

The Contractor shall arrange training program at site for WBSEDCL personnel. The duration of the training program shall be minimum 02 (two) days. The contractor shall provide training materials at least 07 (seven) days before commencement of training program. The training shall be the part of contract and no extra amount shall be provided for organizing the training program.

TECHNICAL SPECIFICATION (CIVIL WORKS)

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All civil works shall conform to the latest Indian standards, codes etc as where applicable or to equivalent applicable international standards approved by the engineer-in-charge. Civil works include but not limited to the following items whichever necessary for implementation of the Solar PV Project. All civil works should be carried out as per the relevant standards and guidelines /WB PWD Schedule of Works.

1. MODULE MOUNTING STRUCTURE

1.1 SCOPE

This section covers activities related to design, manufacturing, testing, supply, insurance, transportation, delivery at project site, storage, erection, testing of module mounting structure as detailed hereunder.

Adequate number of mounting structure shall be provided for installation of the required number of PV module. The contractor shall provide the details of this item in the detailed design report**.**

1.2 TECHNICAL REQUIREMENTS

- The Module mounting structure design shall be appropriate and innovative. It must follow the existing land profile.
- The structure shall be designed to allow easy replacement of any module and shall be in line with the site requirement.
- Design drawings with material selected and their standards shall be submitted for prior approval.
- The bidder shall design the structure height considering highest flood level at the site. The minimum clearance between the lower edge of the module and the ground shall be the higher of (i) 300mm above highest flood level at the site and (ii) 800 mm.
- There must be sufficient gaps between the rows of the panels and all precautions to be taken to avoid any shading on the panels.
- The module alignment and fixed tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided based on the location of array installation.
- The mounting structure for fixed tilt angle shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly. Welding of structure at site shall not be allowed.
- The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- All fasteners shall be of stainless steel of grade SS 316 and must sustain the adverse climatic conditions. Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. However if stainless steel (SS 304) fasteners are used they must have protective coating to ensure the life of 25 years. Clamps/bolts shall use EPDM rubber and shall be designed in such a way so as not to cast any shadow on the active part of the module. All these nuts and bolts have to be got approved from the department.
- Nut & bolt, supporting structures including module mounting structures shall have to be adequately protected from atmosphere and weather prevailing in the area.

- The Mounting structure shall be grounded properly in line with IS 3043.
- The support structure & foundation shall be designed with reference to the existing soil condition in order to withstand wind speed of the location as given in relevant Indian code for wind (IS 875 Part III, latest edition) and seismic load (IS 1893, latest edition).
- The module mounting structure shall be designed as per prevailing IS 800 and IS 801 and Sections shall be as per IS 808 and IS 811 (Latest edition) and shall be safe against wind and seismic force. Detailed design including STAAD output file shall be submitted for final approval. The minimum thickness of the structural sections:
  - Stub/Column-3.15 mm
  - Rafter-2.5 mm
  - Bracing/Purlin & other members -2 mm,

  However, the final thickness of the structure shall be arrived by structural analysis, considering combination of all possible loads. The members are to be designed taking into consideration the hot & humid nature of the area.
- The array structure shall be made of hot dipped galvanized steel of suitable size. The specification of steel should be as per relevant IS 2062 (Latest Edition). The thickness of galvanization should be as per the relevant standards for galvanization, subject to, a minimum of 80 microns. It is to ensure that before galvanization the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or such foreign material as are likely to interfere with the galvanization process. The bidder should ensure that inner side should also be galvanized. All galvanized materials shall withstand tests as per IS 2633.
- Foundation is to be provided with piling if necessary. Foundation should be of minimum M25 grade of concrete (with provision of cube test as per relevant IS code). Design should be such that the foundation should be safe against the Soil Load Bearing Capacity as obtained at site. The work includes necessary excavation, concreting, curing, back filling, shoring & shuttering etc.
- For multiple module mounting structures located in a single row, the alignment of all modules shall be within an error limit of maximum 10 mm.
- The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.
- Bidder must submit all the quality test documents and test certificates complying with the requirement of the structure.

1.3 APPROVAL

- Proposed layout of the Module mounting structure fitted with equipments & other ancillaries as required over the proposed developed land profile shall be submitted with Detailed Design Report, and soft copy of STAAD file for approval.
- Design, drawings, specifications of all components with material selected & installation details shall also be included with Detailed Design Report.
- Approval of the Engineer in charge should be taken before execution of the work at site.

The contractor shall deliver the product to the site only after receipt of such approval of drawing, and inspection of materials, from WBSEDCL, against their prayer in writing.

2. OTHER CIVIL WORKS

2.1 FOUNDATIONS

The contractor is responsible for the detailed soil investigation and subsequent foundation design of the structures in the plant. The foundation of the module mounting structures, buildings and other important structures must be approved by WBSEDCL prior to construction. The foundation of the Main Control Room Building shall have the provision of accommodating one floor (extra), in addition to that required, in accommodating the equipment and personnel. The contractor must provide the detailed design calculations of the foundation, including the soft copy of the STAAD output file. The foundations should be designed considering the weight and distribution of the structure and assembly, and a wind speed as per IS: 875 part-III. Seismic factors for the site have to be considered while making the design of the foundation. Successful Bidder shall also plan for transport and storage of materials at site.

2.1.1 PLUMBING AND SANITARY

Sanitary fittings, which include water closet, wash basins, sink, urinal fitting including flushing tank, and necessary plumbing lines shall be provided for office cum stores building and Security house. The specification of materials shall be Heavy duty as followed by WB PWD SOR and shall be approved by the Engineer-in-charge.

2.1.2 PLASTERING

All faces of brick work (both internal and external) should be plastered, with cement mortar (1:6), both for 10" thick and 5" thick wall and all ceilings should be plastered with cement mortar (1:4) as per IS 1542.

TECHNICAL SPECIFICATION: ELECTRICAL

Please refer items whichever are applicable as per BOQ

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1. SOLAR PV MODULE

1.1 SCOPE

This section covers activities related to design, manufacturing, testing at works, supply, insurance, transportation and delivery at Project site, storage, erection, testing, commissioning of solar modules as detailed hereunder.

a. Solar Mono PERC/N-Type modules having same specification or dimension shall be used. However, the make, capacity, technical specification and the model no. of each module for the whole project shall be the same.

1.2 STANDARDS

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

Sl. No.	Standards	Description
1	IEC: 61215/IS: 14286	Crystalline silicon terrestrial photovoltaic modules – Design qualification and type approval.
2	IEC: 61730 – Part 1	Photovoltaic (PV) module safety qualification – Requirements for construction.
3	IEC: 61730 – Part 2	Photovoltaic (PV) module safety qualification – Requirements for testing.
4	IEC 62716 Ed.1	Photovoltaic (PV) modules - Ammonia corrosion testing
5	IEC: 61701/IS: 61701	Salt Mist Corrosion Testing of the module.
6	IEC: 62804	Test method for detection of Potential Induced Degradation of photovoltaic (PV) modules.

The proposed PV Module must have the Test Certificate issued from accredited test laboratories of Ministry of New and Renewable Energy, Government of India.

The test certificates issued from IEC accredited laboratories shall also be acceptable.

The manufacturers shall get their samples tested as per latest norms of MNRE, Govt. of India.

PV Modules should have been included in the ALMM list as per MNRE Approved Models and Manufacturers of Solar Photovoltaic Modules.

1.3 IDENTIFICATION AND TRACEABILITY

Each PV module must use a RF identification tag (RFID), which must contain the following information:

i. Name of the Plant Owner
ii. Name of the manufacturer of PV Module
iii. Name of the Manufacturer of Solar cells
iv. Month and year of the manufacture (separately for solar cells and module)
v. Country of origin (separately for solar cells and module)
vi. I-V curve for the module
vii. Peak Wattage, I_m, V_m and Fill Factor for the module
viii. Unique Serial No and Model No of the module
ix. Date and year of obtaining IEC PV module qualification certificate

x. Name of the test lab issuing IEC certificate

xi. Other relevant information on traceability of solar cells and module as per ISO 9000 series.

RFID for each solar module shall be provided inside or outside of the module and must be able to withstand environmental conditions and last the lifetime of the solar module as per latest MNRE norms.

All individual modules shall be provided with Name Plate label at the back of module which shall provide the information given below for identification. They shall be clearly visible and shall not be hidden by equipment wiring. Type of labels and fixing of labels shall be such that they are not likely to peel off/ fall off during the life of the panel. Name plate shall contain the following:

i. Manufacturer's Name
ii. Model Number, Serial Number
iii. Overall Dimensions (W x L x D)
iv. Weight (kg)
v. Maximum Power (PMAX), Voltage (V_{mp}), Current (I_{mp})
vi. Short Circuit Current (I_{sc}), Open Circuit Voltage (V_{oc})
vii. Nominal System Voltage
viii. Relevant standards, Certification Lab details
ix. "Property of WBSEDCL"
x. Warnings, if any

1.4 AUTHORIZED TESTING LABORATORIES/ CENTERS

PV modules must qualify (test reports/ certificate from IEC/NABL accredited laboratory should be enclosed) as per the relevant IEC standard. Additionally, the performance of PV modules at STC conditions must be tested and approved by one of the IEC / NABL Accredited Testing Laboratories including Solar Energy Centre (SEC). However, qualification certificate from IEC/NABL accredited laboratory as per relevant standard for any of the higher wattage (greater than 50 kWp) regular module should be accompanied with the SEC report/certificate.

1.5 PERFORMANCE WARRANTY

A. Material Warranty: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than ten (10) years from the date of installation or commissioning, whichever is earlier.

i. Defects and/or failures due to manufacturing
ii. Defects and/or failures due to quality of materials
iii. Non conformity to specifications due to faulty manufacturing and/or inspection processes.

If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owner's sole opinion. The contractor shall be responsible to contact with the contractor if any of the above mentioned cases occurred.

B. Performance Warranty: The manufacturer should warrant the output of Solar Module(s) for at least 90% of its rated power after initial 10 years & 80% of its rated power after 25 years from the completion of trial run at site/date of final commissioning. The contractor shall collect the Warranty Certificate for performance of the modules from the manufacturer and submit the same to WBSEDCL prior to delivery of the products to the respective sites.

If, Module(s) fail(s) to exhibit such power output in prescribed time span, the

Contractor will bound to either deliver additional PV Module(s) to replace the missing power output with no change in area of site used or replace the PV Module(s) with no extra cost claimed at Owner's sole option.

The manufacturer should warrant the output of Solar Module(s) for at least 90% of its rated power after initial 10 years & 80% of its rated power after 25 years from the completion of trial run at site/ date of final commissioning.

Manufacturer of proposed PV modules must have the ISO 9001:2008 or ISO 14001 Certification for their manufacturing unit for their said manufacturing item.

Note: Only indigenously manufactured PV modules should be used in Solar PV Power Plants under this scheme. However, other imported components can be used, subject to adequate disclosure and compliance to specified quality norms and standards.

1.6 PERFORMANCE RATIO OF THE PLANT

Not applicable.

1.7 TECHNICAL REQUIREMENTS

- The module frame shall be made of anodized Aluminium or corrosion resistant material, which shall be electrically & chemically compatible with the structural material used for mounting the modules. In case of metal frames for modules, it is required to have provision for earthing to connect it to the earthing grid. Module frame thickness/Height should be minimum 35 mm, the anodization thickness shall not be less than 15 micron. Junction box of IP 67 rated with min 3 no. of bypass diode and MC4 connectors with 0.5 meter of TUV 2pfg 1169/09.07 certified Cu cable of 4 sq mm.
- Solar module shall be laminated using lamination technology using established Monomer (EVA: Ethylene-vinyl acetate).
- The back sheet used in the crystalline silicon based modules shall be of 3 layered structures. Outer layer of fluoro Monomer, middle layer of Monoester (PET) based and Inner layer of fluoro Monomer or UV resistant Monomer. Back sheet with additional layer of Aluminium also will be considered. The thickness of back sheet should be of minimum 530 microns with water vapour transmission rate less than 3g/m2/day. The Back sheet shall have voltage tolerance of more than 1500 V.
- The EVA used for the modules should be of UV resistant in nature. No yellowing of the back sheet with prolonged exposure shall occur.
- The sealant used for edge sealing of PV modules shall have excellent moisture ingress protection with good electrical insulation (Break down voltage >15 kV/mm) and with good adhesion strength.
- The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing during the whole life of the solar modules.
- The Module shall be made of high transmittance glass front surface giving high encapsulation gain. The glass used to make the crystalline silicon modules shall be toughened low iron glass with minimum thickness of 3.2 mm for 144 half cut cell module. The solar cell shall have surface anti-reflective coating to help to absorb more sunlight in all weather conditions with low iron content. The

  glass used shall have transmittance of above 90% and with bending less than 0.3% to meet the specifications.
- Module rating is considered under standard test conditions, however Solar Modules

shall be designed to operate and perform as per installation site condition.

- All materials used shall be having a proven history of reliable, light weight and stable operation in external outdoor applications and shall have service life of 25 years.
- The modules should be 100% PID (Potential Induced Degradation) free and should comply with IEC 62804.
- Solar PV Module design shall conform to following requirement:
  - Weather proof DC rated MC connector and a lead cable coming out as a part of the module, making connections easier and secure, not allowing for any loose connections.
  - Resistant of water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.
  - The PV Junction Box shall confirm IP 67 and shall have sufficient bypass diodes to avoid shadowing effects.
- Modules shall perform satisfactorily in relative humidity up to 85% and temperature between -10^{0}C and 85^{0}C (module temperature).
- The PAN file of the solar module shall be validated by Third party Lab.
- The developer shall arrange for the details of the materials along with specifications sheets of from the manufacturers of the various components used in solar modules along with those used in the modules sent for certification. The Bill of materials (BOM) used for modules shall not differ in any case from the ones submitted for certification of modules.
- Proof of procurement of components like cell, back sheet, lamination material, frames, Glass, sealant etc), mentioning manufacturer name, manufacturing date and relevant test certificate shall be submitted at the time of pre-dispatch inspection and acceptance.
- No different quality/makes of back sheets shall be used in the single lot of supply of modules.
- The modules used in the Plant are to be freshly manufactured (not having manufactured before the last date of bid submission)
- The I-V characteristics of all modules as per specifications to be used in the systems are required to be submitted at the time of supply.
- SPV module shall have module safety class-II, fire safety class C and should be highly reliable, light weight and must have a service life of more than 25 years.

1.8 SPECIFICATION OF THE PV MODULES

Desired specification of the PV Module shall be as mentioned hereunder:

SI. No.	Item	Description
1	Type	Mono-PERC Crystalline Cell
2	Efficiency of module	Minimum 20.5 % at STC
4	Fill Factor	Minimum 78 %
5	No. of cells per module	Half Cut 144 Cells
6	Module Frame	Non-corrosive and electrolytically compatible with the structural material, preferably anodized Aluminium.
7	Termination box	Thermo-plastic, IP 68, UV resistant
8	Blocking & Bypass Diode	Schottky type

10	Power Rating	The nominal power of a single PV module shall be minimum 550 Wp
11	Power tolerance	upto +5 %
12	Temperature co-efficient of power	Maximum - 0.39 % / °C
13	Glass	High transmittance glass with Anti Reflective Coating (ARC)
14	RF Identification tag for each solar module	Shall be provided inside or outside the module and must be able to withstand environmental conditions and last the lifetime of the solar module as per MNRE Norms.

1.9 APPROVAL

1.10 APPROVAL

- The Detailed Design Report Submitted by the contractor to WBSEDCL must contain but not limited to the following details of the solar modules:
  - Detailed specification
  - Necessary Drawings
  - Type Test Report and Necessary Certificates etc.
  - Satisfactory performance certificate not less than 1 year from the date of publication of Bid.
- Joint inspections and testing will be done by WBSEDCL and the authorized representatives of the contractor at the manufacturer's workshop on regular basis for quality assurance and testing. Acceptance Tests as per relevant Indian Standard shall be carried out at the module manufacturer's workshop. Following tests as per relevant Indian Standard shall be carried out on certain number of modules from a lot (decided by WBSEDCL) as acceptance tests of Solar PV Modules:
  - Visual Inspection
  - Performance Test of the modules at STC and NOCT with Sun Simulator of Class B or better as per Indian Standard
  - Performance Test of the modules at low irradiance (200 W/m^2) with Sun Simulator of Class B or better as per Indian Standard
  - Dielectric withstand test
  - Continuity and leakage current test
  - Insulation Resistant test
  - Wet leakage current test
  - Mechanical load test
  - PID Test report will be verified during the approval of the offered module and also during inspection one (1) sample for entire project will be selected randomly by WBSEDCL, which shall be tested at third party laboratory.
  - Any other test as desired by WBSEDCL

  Arrangements for the aforesaid testing and inspection at manufacturer's end are to be provided by the contractor.
- Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:
  - Guarantee Certificates
  - Instructions manual for installation and operation.
  - Test reports for routine tests and acceptance tests etc.
- The contractor shall deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.
- WBSEDCL may select certain number of modules delivered at site by the contractor on random basis for conducting performance test of those modules from any accredited test laboratory of MNRE/NABL. If there are any discrepancy found in the test results and the values specified by the contractor, the contractor will be bound to accept the decision made by WBSEDCL in respect of taking further course of action.

2 PV ARRAY CONFIGURATIONS

2.1 SCOPE

This section covers activities related to PV array configurations and design, manufacturing, testing at works, supply, insurance, transportation and delivery at Project site, storage, erection, testing, commissioning of array junction box as detailed hereunder.

The Solar array shall be configured in multiple numbers of sub-arrays, providing optimum DC power to auditable number of sub arrays. The Contractor shall submit their own design indicating configuration of PCU and respective sub arrays and associated bill of material.

- UV resistant Cable-ties (suitable for outdoor application shall be used to hold and guide the cables/wires from the modules to junction boxes or inverters. All the cables were aesthetically tied to module mounting structure.
- In case the string monitoring Box (SMB) is mounted on the module mounting structure, Contractor to take into consideration of the load thus added on the MMS. Accordingly, suitable supporting members for mounting the SMB must be designed and supplied. Separate structure for mounting of SMB can also be proposed.
- Every major Component of the Plant should be suitably named/ numbered & marked for ease of traceability, identification and maintenance.

2.2 STRING MONITORING BOX (SMB)

a. Adequate number of SMBs shall be provided for termination of array string with inverter.

b. The number and specification of PV Array Junction Box will be as per plant configuration.

The SMBs shall be suitable for interfacing with SCADA system and all necessary transducers shall be included in the scope of supply.

2.3 STANDARDS

The SMBs shall conform to the latest edition of following Standards except where specified otherwise in this specification:

Sl. No.	Standards	Description
1	IEC 61439	Low Voltage Switchgear and Assemblies
2	IEC60269/IS 13703	Low-voltage fuses
3	IEC 60529	Ingress Protection of Enclosure
4	IEC 62262	External Mechanical Impact Protection
5	IEC 61326	EMC Requirements of Electrical Equipments

6	IEC 61643-11	Surge Protection Device
7	IEC 62852	Solar cable connector
8	IEC 60695-2-11	Fire hazard test

……

Equipment meeting with other authoritative standards which ensure an equal or better quality is also acceptable. Where the equipment conforms to any other authoritative standard, the salient points of difference between the standard adopted and IS/IEC shall be clearly brought out in the tender. Complete set of documents and standards in English shall be supplied by the bidder without any extra charge. It shall, however, be ensured that equipment offered comply with one consistent set of standards except in so far as they are modified by the requirement of this specification.

2.4 TECHNICAL REQUIREMENTS

- The SMBs shall have suitable arrangement for the followings (typical):
  - Provide arrangement for disconnection for each of the groups.
  - Provide a test point for each sub-group for quick fault location and to provide group array isolation.
  - SCADA Communication device with all necessary equipment for communicating with main SCADA Server.
  - Suitable space for workability and natural cooling.
- All junction boxes should be equipped with appropriate functionality, safety (including fuses, grounding, contacts etc.) and protection.
  - The junction boxes shall be dust, vermin, and waterproof and made of thermoplastic/ metallic in compliance with IEC 62208, which should be sunlight/ UV resistive as well as fire retardant thermoplastic material. Enclosure degree of protection shall be at least IP 67 and mechanical impact resistance Class II shall be at least IK 08.
- The terminals will be connected to copper bus-bar arrangement of proper sizes to be provided. The junction boxes will 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 weather resistant cable ferrules will be fitted at the cable termination points for identification.
- SMBs shall have adequate ratings of solar DC fuses at the terminals (+ve as well as –ve), provided in recommendation with the inverter manufacturer. The fuses should be so designed that it should protect the modules from the reverse current overload.
- At outgoing side DC Disconnector switches Switch of suitable capacity shall be provided.
- The SMBs shall also have suitable surge protection. In addition, over voltage protection shall be provided between positive and negative conductor and earth ground such as Surge Protection Device (SPD). The maintenance free earthing shall be done as per the relevant standards.

2.5 APPROVAL

The Detailed Design Report Submitted by the contractor to WBSEDCL must contain but not limited to the following details of the array junction boxes:

- Detailed specification

- Necessary drawings, BOM, Test & Performance certificates etc.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Instruction manuals for installation and operation.
- Necessary test certificates

The contractor shall deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

3. SOLAR INVERTER

3.1SCOPE

This section covers the activities related to design, manufacturing, testing at works, supply, insurance, transportation and delivery at project site, storage, erection, testing, commissioning of Solar Inverters as detailed hereunder.

a. The rated power/name plate capacity of the inverters shall be the AC output of the inverter at 50°C.

b. The scope of supply shall also include necessary spares, if any, required for normal or any breakdown maintenance for at least 5 (five) years and special tools & plants required for erection & maintenance. Corresponding parts of all the equipment's & spares shall be of the same specification & workmanship and shall be interchangeable.

All the material & workmanship shall be of reputed make as have proven successful in their respective uses in similar services & under similar condition.

The solar inverter/power conditioning unit shall be suitable for interfacing with SCADA system and all necessary transducers shall be included under the scope of supply. Warranty of Solar Inverters shall be 05 years.

3.2STANDARDS

The equipment and materials covered by this specification shall conform to the latest edition of following Indian Standards or equivalent IEC standards except where specified otherwise in this specification:

Sl. No.	Standards	Description
1	IEC: 61683	Photovoltaic systems – Power Conditioners – Procedure for measuring efficiency
3	IEC 60068	Environmental Testing
4	IEC 62116 / IEEE 1547/UL 1741/ equivalent IS standard	Photovoltaic (PV) systems - Characteristics of the utility interface
5	IEC 61727 Relevant CEA/ CERC regulation and grid code (amended up to date)	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
6	IEC 61000 series	EMC, harmonics, etc.
7	IEC 62109 (1&2), EN 50178 or equivalent Recommended practice for	Electrical safety
8	PV – Utility interconnections	IEEE standard 929 – 2000 or equivalent
9	IEEE 519	Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
10	IEC 62093	Balance-of-system components for photovoltaic systems Design qualification natural environments
11	CEA Technical Standards for Connectivity to the Grid Regulations 2007 with 2013 Amendment	

Solar Inverters shall have certificate and approval from VDE, IEC, UNE, RD, EDF, BDEW etc. The inverters should have CE conformity according to LVD (Low Voltage Directive) and EMC (Electro Magnetic Compatibility) Directive for safety purpose.

Type test certificate issuing authorities should be any NABL/IEC Accredited Testing Laboratories or MNRE approved test centers.

Equipment meeting with other authoritative standards which ensure an equal or better quality is also acceptable. Where the equipment conforms to any other authoritative standard, the salient points of difference between the standard adopted and IS/IEC shall be clearly brought out by the contractor.

3.3TECHNICAL REQUIREMENTS

- The inverter should be 3-Φ static solid state type power conditioning unit.
- Inverter/PCU shall be centralized grid tied in nature; Maximum Power Point Tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array. The MPPT should be microprocessor based to minimize power losses. The details of working mechanism of MPPT to be submitted with the detailed design report. The MPPT unit shall confirm to IEC 62093 for design qualification.
- The minimum euro efficiency of the PCU as per IEC 61683 shall be 98%. The bidder shall specify the conversion efficiency at following load conditions i.e. 25%, 50%, 75% and 100% during detail engineering, which shall be confirmed by type test reports.
- Degree of protection: Minimum IP65 for Electronic section & minimum IP65 for rest part of Inverter.
- Individual IGBT stacks shall be interchangeable and capable of operating even if one or two stacks out of the three gets damaged.
- Nuts & bolts and the PCU enclosure shall have to be adequately protected taking into consideration the atmosphere and weather prevailing in the area.
- Only those PCUs/ Inverters which are commissioned for the design capacity till date in India shall be considered for this project with individual Inverter capacity to be selected as per site suitability. Contractor has to provide sufficient information to the satisfaction of the plant owner before placing the final order for PCUs/Inverters. Service center of the PCU manufacturer must be in India
- All PCUs shall consist of associated control, protection and data logging devices and remote monitoring hardware and compatible with software used for SMB level monitoring.
- The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the technical specification to be submitted with the detailed design report.
- The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently & automatically. Inverters / PCU shall operate in sleeping mode when there will no power connected.
- The Inverter shall have internal protection arrangement against any sustained fault in output line and lightning in the grid. AC protection boxes shall be provided at the inverter output which shall include over current, under voltage protection etc.
- Both AC & DC lines should have suitable fuses & surge arrestors and contactors to allow safe start up and shut down of the system as per the type tested design.

- The inverter output shall always follow the grid in terms of voltage and frequency. This shall be achieved by sensing the grid voltage and phase and feeding this information to the feedback loop of the inverter. Thus control variable then controls the output voltage and frequency of the inverter, so that Inverter is always synchronized with the grid. The inverter shall be self- commutated with Pulse width modulation (PWM) technology.
- The PCU shall be able to withstand an unbalanced load conforming to related IEC standard (+/- 5% voltage). The PCU shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters – beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation feature, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.
- Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are over voltage, over current, earth fault, short circuit and reverse power.
- The inverter itself shall consist of one circuit breaker for isolation from the circuit during any fault or maintenance purpose.
- All three phases shall be supervised with respect to rise/fall in programmable threshold values of frequency.
- The PCU shall be capable of controlling power factor dynamically.
- The inverters shall operate satisfactorily within the operating ambient temperature range of -15°C to +60°C. The contractor shall assure that the inverter shall not de-rate up to +50°C ambient temperature.
- To take care of PID (Potential Induced Degradation), the inverter shall have active negative grounding kit. [Only PID free Solar PV modules shall be used for the proposed plant and necessary test certificates shall be submitted.
- The PCU shall have the following main features for convenience of operation:
    - Auto 'Wake up': The system shall automatically "wake up" in the morning and begin to export power provided there is sufficient solar energy and the grid voltage and frequency is in range.
    - Stand – By Mode: The control system shall continuously monitor the output of the solar power Plant until pre-set value is exceeded & that value to be indicated.
    - Sleep Mode: Automatic sleep mode shall be provided so that unnecessary losses are minimized at night. The power conditioner must also automatically re-enter standby mode when threshold of standby mode reached.
    - Basic System Operation (Full Auto Mode): The control system shall continuously monitor the output of the solar power Plant until pre-set value is exceeded & that value to be indicated.
- Following protections shall be provided with the inverter.
    - Over voltage both at input & output
    - Over current both at input & output
    - Over/under grid frequency
    - Synchronization loss
    - Anti-islanding Protection (IEEE 1547/UL 1741/ equivalent BIS standard)
    - Heat sink over temperature
    - Short circuit
    - Protection against lightening
    - Protection against unbalance phase voltage
    - Power regulation in the event of thermal overloading

- Protection for each solid-state electronic device
- Surge arrestors to protect against Surge voltage induced at output due to external source
- Direct earth fault protection and body earthing
- Set point pre-selection for VAR control
- Insulation monitoring of the PV array with sequential fault location
- Any other protections required

- Inverters should have user friendly LED/LCD or touch display for programming and view on line parameters such as:
  - Inverter per phase Voltage, current, kW, kVA, frequency and power factor
  - Grid Voltage, frequency and power factor
  - DC voltage and current
  - Inverter Import export kWh summation
  - Solar kWh summation
  - Inverter ON/OFF
  - Grid ON/OFF
  - Inverter under voltage/over voltage
  - Inverter over load
  - Inverter over temperature
  - Any other if required

3.4SPECIFICATION

Sl. No.	Operating Parameter	Desired specification
1	Input (DC)	
	PV array connectivity capacity	1MW
	Maximum System Voltage	1000V
	Number of MPPT Channel	As per design of the manufacturer.
2	Output (AC)	
	Nominal AC Power output	400V,1MW
	Number of Grid Phase	3
	Adjustable AC voltage range	+/- 10%
	Frequency range	+/- 5%
	AC wave form	Sine wave
	THD	Less than 3% at 100% load
	Switching	H.F. transformer/transformer less
3	General Electrical data	
	European Efficiency	98 % (minimum)
	No load loss	< 1% of rated power
	Maximum loss in sleep mode	< 0.05% of rated power
4	Protection	
	DC Side	As per Technical Requirement
	AC side	As per Technical Requirement
	Isolation Switch	PV array Isolation switch (DC)

SI. No.	Operating Parameter	Desired specification
	Ground fault detection device (RCD)	To be provided
5	Display	
	Display type	LED/LCD or touch display
	Display parameter	
	DC	As per Technical Requirement
	On grid connected mode	As per Technical Requirement
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. Plant based remote monitoring system
10	Storage of Data	At least for 1 year. Separate data logger may be provided to meet the criteria.
11	Monitoring	Matched with the monitoring and data logging system (SCADA)
12	Mechanical Data	
	Protection Class	As mentioned in the Technical Requirement
	DC Switch	Integrated
	Operating ambient temperature	-15° C to +60° C
	Relative Humidity	15 to 95 %
	Noise Emission	Less than 80 dB (A) @ 1 meter
	Cooling	Forced cooling

3.5APPROVAL

The Detailed Design Report Submitted by the contractor to WBSEDCL must contain but not limited to the following details of the Solar Inverter/Power conditioning Unit:

- Detailed technical description of the complete unit including necessary design calculations.
- Necessary Schematic & Other Drawings.
- Type Test Reports, Performance certificate from plant owner etc.

Joint inspections and testing will be done by WBSEDCL and the authorized representatives of the contractor at the manufacturer's workshop on regular basis for quality assurance and testing. Acceptance Tests as per relevant Standard shall be carried out at the module manufacturer's workshop. Following tests shall be carried out on certain number of Inverters from a lot (decided by WBSEDCL) as acceptance tests of Solar Inverters:

- Visual Inspection
- Performance Test and measurement of AC & DC parameters

- DC reverse polarity protection
- Islanding Protection
- Over Voltage & Under Voltage withstand
- Over Frequency & Under Frequency withstand
- Night consumption
- Any other test as desired by WBSEDCL

Arrangements for the aforesaid testing and inspection at manufacturer's end are to be provided by the contractor.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Instructions for installation and operation, manual
- Safety precautions
- Test reports for routine tests and acceptance tests etc.

The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

4.INVERTER DUTY TRANSFORMER

4.1 Scpope

This section covers the activities related to design, manufacturing, testing at works, supply, insurance, transportation and delivery at Project site, storage, erection, testing, commissioning of step up transformers and associated equipments as detailed hereunder.

- Adequate number of 3-Φ, multiple winding, oil filled, ONAN type cooled transformers with suitable capacity considering 0.9 power factor shall be provided to step up voltage from 3-Φ, Grid tied Solar Inverter output to 33 kV voltage level for feeding the generated power to the 33 kV switchyard.
- LV winding of the transformer will be connected to the output of inverters and the HV sides will be connected to the 33 KV line through VCB, Isolator etc. Transformers shall be Oil Type and placed outside of each control room.
- All the transformers shall be suitable for outdoor installation with 3 phases,
- 50Hz and shall be suitable for service under fluctuations in supply voltage up to plus 10% to minus 15%.

The scope of supply shall also include necessary spares required for normal operation & maintenance of transformers for a period of 5 (five) years & special tools & plants required for erection & maintenance. Corresponding parts of all the equipments & spares shall be of the same material & dimensions, workmanship & finish and shall be interchangeable. All the material & workmanship shall be of suitable commercial quality as have proven successful in their respective uses in similar services & under similar condition.

The transformers and associated equipment shall be suitable for interfacing with SCADA system and all necessary transducers shall be included in the scope of supply.

4.2STANDARDS

The equipments and materials covered by this specification shall conform to the latest edition of following Indian Standards or equivalent IEC standards except where specified otherwise in this specification:

Sl. No.	Standards	Description
1	IS: 2026 (Part I to IV)/ IEC 60076	Power Transformer
2	IS: 2099/IEC 137	Transformers bushings for alternating voltage above 1kV
3	IS: 335	Transformer oil
4	IS: 3637	Gas and oil operated relay
5	IS: 3639	Fittings and accessories for power transformers
6	IS: 6088	Dimensions for porcelain transformer bushings
7	IS: 3347	Loading guide for oil-immersed transformers
8	CBIP Manual No. 295 and latest publications	Transformer Design Manuals

Equipment meeting with other authoritative standards which ensure an equal or better quality is also acceptable. Where the equipment conforms to any other authoritative standard, the salient points of difference between the standard

adopted and IS/IEC shall be clearly brought out in the tender. Complete set of documents and standards in English shall be supplied by the contractor without any extra charge. It shall, however, be ensured that equipment offered comply with one consistent set of standards except in so far as they are modified by the requirement of this specification.

4.3 TECHNICAL REQUIREMENTS

The transformers shall be three winding, ONAN, oil filled, 3-Φ, Step Up transformers.

Sl. No.	Standards	Description
1	Type	Multi Winding (as per Plant Design)
2	No. of phases	3
3	Installation	Outdoor Foundation
4	Rated continuous MVA at maximum ambient temperature of 40^0C	As required according to Solar Inverter capacity
5	% Impedance at 75°C, rated current & frequency	As per relevant Indian Standard
6	Type of cooling	ONAN
7	Winding material	Copper
8	Connection	
	HV	Delta
	LV	Star/ Star-Star/as per design
9	Vector group	Dy11/ Dy11y11/as per design
10	Voltage	
	HV	33 kV
	LV	As per Solar Inverter Output Voltage
11	Rated Frequency	50 Hz
12	Type of Bushing	
	HV Winding	Porcelain/ XLPE bushing
	LV Winding	Porcelain bushing
13	Insulation level (impulse withstand)	
	HV	170kV (Peak)
	LV	NA
14	Insulation level (Power freq. withstand)	
	HV	70 kV (rms)
	LV	3 kV (rms)
15	Tapping	OCTC
	Range	+5% to -5% @ 2.5%
16	Temperature rise of oil/ winding over design ambient temperature of 50°C	50ºC / 55ºC

Sl. No.	Standards	Description
17	Hot spot temperature over a maximum yearly weighted average ambient temperature of 32 ºC	105°C
18	Short circuit current on HV side	25 kA
19	Short circuit withstand time	3 sec
20	Insulation	
	HV winding	Class A (Winding insulation shall be able to withstand 33 kV continuously)
	LV winding	Class A (Uniformly insulated)
21	Voltage withstand capacity during sudden disconnection of load	1.4 times the rated voltage for 5 sec. 1.25 times the rated voltage for 1 min. 1.1 times the rated voltage for continuous operation.
22	Noise level	< 90 dB As per NEMA TR-1 standard
23	Cooling medium	Mineral oil (as per IS 335)
24	Earthing	As per Inverter manufacturer recommendation.
25	Minimum efficiency	98%
26	Only Type –Tested transformers shall be used	

4.4DESIGN CRITERIA

- The Design of the IDT shall be in line with the IS 2026, IEC 60076 and IEEE Std C57.12.00 with latest amendments.
- The rating of the Transformers shall be sufficient to evacuate generated power from the Solar Inverter under full load conditions. The Transformers shall be able to evacuate generated power under all conditions of ambient temperature, frequency and voltage variations.
- The transformers will have Off Circuit Tap Changer (OCTC) with tap ranging +5% to -5% in steps of 2.5 % at HV side. The transformers will operate without injurious heating at the rated capacity at any voltage within +/-10% of the rated voltage of that particular tap. The transformer will be designed to deliver rated MVA continuously even at the lowest tap without exceeding specified temperature rise.
- HV line terminals shall be brought out through 33 kV class weather proof, shaded porcelain bushing.
- Ambient air temperature for the transformer
  - Maximum ambient air temperature: 50^0 C
  - Maximum daily average ambient air temperature: 40^0 C
  - Maximum yearly weighted average ambient air temperature: 32^0 C
  - Minimum ambient air temperature: - 5^0 C
- The transformers shall be designed to withstand short circuit current of 25 KA or second without any damage. This capability shall be demonstrated by type test report.

- The transformers will be capable of being loaded in accordance with IS 3347 - loading guide for oil immersed power transformers. The transformers shall also be designed for operation at unbalanced loading conditions.
- The transformers shall be suitable for co-ordination and integration with SCADA System and necessary contacts and/or ports for the purpose shall be provided.
- Earthing arrangement of the transformers shall be provided as per the relevant Indian Standard and as per Inverter manufacturer recommendation.
- Necessary protection arrangement should be provided in the transformer.
- Marshaling Box shall be of sheet steel, dust and vermin proof provided with proper lighting and thermostatically controlled space heaters. The degree of protection shall be IP 55 or better. Marshalling Box of all transformers shall be preferably Tank Mounted. One dummy terminal block in between each trip wire terminal shall be provided. 20% spare terminals shall be provided on each panel. The gasket used shall be of neoprene rubber. Also Marshalling Box, shall be at least 450 mm above ground level. Wiring scheme (TB details) shall be engraved in a stainless steel plate with viewable font size and the same shall be fixed inside the Marshaling Box door.
- The radiators shall be detachable type, mounted on the tank with shut off valve at each point of connection to the tank, lifts, along with drain plug/valve at the bottom and air release plug at the top.
- Construction of different parts of the transformer shall conform to the latest edition of IS 2026.
- Fittings and accessories as per relevant Indian Standard shall be provided within the scope of the work.

4.5TYPE TSET

All the transformers used for the plant must be type tested. The contractor must ensure the type tests are to be conducted separately at no extra cost for the transformers. These tests should be conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at CPRI/NABL accredited Laboratory/ Govt. Recognized test house. The type tests shall be performed are furnished below:

Sl.No.	TYPE TESTS
1.	Temperature Rise test at a tap corresponding to maximum losses as per IEC 60076. Gas Chromatography shall be conducted on oil sample taken before & immediately after temperature rise test. Gas analysis shall be as per IS: 9434 (based on IEC: 60567), results will be interpreted as per IS: 10593 (based on IEC: 60599)

2.	Measurement of harmonics of no load current (special test)
3.	Short Circuit Test as per IEC76/IS202
3.	Measurement of acoustic noise level as per NEMA TR-1 (special test)
5.	Tank Vacuum & Pressure Test (as per CBIP norms)
Sl.No.	**TYPE TESTS**
6.	Impulse Voltage Withstand Test, including Full Waves and Chopped Waves as listed below as per IEC76/IS2026: • One full wave at 50% BIL; • One full wave at100% BIL; • One chopped wave at 50% BIL • Two chopped waves at100%BIL and • Two full waves at100% BIL.

4.6APPROVAL

The Detailed Design Report Submitted by the contractor to WBSEDCL must contain but not limited to the following details of the transformers:

- Detailed specification including Fittings and Accessories
- Necessary Drawings shall contain but not limited to the following:
  - Outline dimension/GA drawings of transformers, fittings/accessories and weight of main components.
  - Bushing Assembly drawings (for both HV & LV).
  - Marshalling Box GA & Connection Drawings.
  - Transport drawings, showing main dimensions and weight of each package.
  - Instruction plate for oil filling procedure for Aircell conservator as per Proforma provided by WBSEDCL during approval.
  - Foundation details
  - Tap-changing equipment
  - Rating & Property plate diagrams
- Necessary test certificates and type test reports.
- GTP shall be provided by the contractor as per Proforma provided by WBSEDCL during approval.

A joint inspection and testing will be done by WBSEDCL and the authorized representatives of the contractor at the manufacturer's workshop. Testing and inspection of the transformers will be carried out as per relevant Indian Standard. Arrangements for the aforesaid testing and inspection at manufacturer's end are to be provided by the contractor.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Instructions for installation and operation, manual
- Safety precautions
- Test reports for routine tests and acceptance tests etc
- Detailed schematics of all power instrumentation and control equipment and subsystems along with their interconnection diagrams. Schematics shall indicate wiring diagrams, their numbers and quantities, type and ratings of all components and subsystems etc.

The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

5.CABLES ~~& CONDUCTOR~~

5.1SCOPE

The scope of work under these specification covers the Design, Manufacture, Assembly, Shop Testing, Delivery at site, transit insurance, Storage, Erection, Testing & Commissioning of power, control and instrumentation cables (complete with cable terminals and all accessories for making the systems complete and for warranting a trouble free and safe operation).

The scope shall also include supply of all material, fabrication and erection of cable supporting structure, cable racks & trays as well as laying of cables on cable racks.

The scope of supply shall also include necessary spares required for a period of 5 (five) years & special tools & plants required for erection & maintenance.

The contractor shall assess the quantity of various sizes of the power, control, instrumentation and communication cables & its accessories along with cable racks & trays including the mandatory spares required for the project and shall furnish same in the bid. He shall also furnish the unit price for each item.

5.2STANDARDS

The equipments covered under this chapter shall comply with the requirement of latest edition of following IS/BS/IEC specifications as amended up to date except where specified otherwise.

Sl. No.	Standards	Description
1	IS: 7098 Part 1	– Cross linked Monoethylene insulated PVC sheathed cables for working voltage up to and including 1.1kV
2	IS: 7098 Part 2	– Cross linked Monoethylene insulated PVC sheathed cables for working voltage from 3.3kV up to and including 33kV
3	IS 10418	Drums for cables
4	IS 8130	Conductors for insulated electric cables and flexible cords
5	IS 8308	Compression type tubular inline connectors for aluminium conductors
6	IS 8309	Compression type tubular terminals for aluminium conductors
7	IS 8438	Moulds of cast resin based straight joints of cable up to including 1.1kV
8	IS 11967	Specifications for co-axial cables
9	IS : 2062	Structural Steel (Standard Quality)
10	IS : 513	Cold rolled low carbon steel sheets & strips
11	IS : 277	Galvanized sheet steel
12	IS : 808	Rolled Steel Beam, Channels and Angle section
13	IS : 2629	Recommended practice for hot dip galvanizing of iron and steel.
14	IS : 2633	Method of testing uniformity of coating on zinc coated articles.
15	IS : 800	Specification for use of structural steel in general building construction.

Cables and other accessories complying with other internationally accepted standards such as IEC, IEEE, BS, etc. will also be accepted if they ensure performance and constructional features equivalent or superior to standards listed above. In such a case the Contractor shall clearly indicate the standard/standards adopted and furnish a copy of English version of the latest revision of the standard(s) along with the Bid and the salient features of comparison shall be brought out.

5.3 GENERAL REQUIREMENTS

Minimum requirements are mentioned hereunder.

- The cables shall be of type and design with proven record of similar power station installations.
- The colours of the cables (both AC & DC) should be so selected that there should not be any problem for identification of cables used for various circuits during inspection & testing.
- To facilitate easy identification of cores, multi-core control and instrumentation cables shall be colour coded by using PVC insulation of red, black, yellow, blue and grey colours in accordance with IS 1554 (Part I).
- Cable lengths shall be considered in such a way that straight through cable joint is avoided.
- Cable terminations shall be made with suitable cable lugs & sockets etc, crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.
- The contractor shall ensure that no bimetallic action takes place between the Aluminium conductor of the cable and the cable connecting lugs by filling the lugs with suitable compound.
- For the main cable ways, a system of cable racks and trays as well as cable ducts and trenches shall be provided. The power and the control cables will run on separate trays. The cables for emergency lighting, fire alarm systems, etc., shall run on separate trays. The power cables shall be laid on the uppermost rack to prevent spread of fire.
- In indoor installations, the cables must be laid through PVC conduit or GI pipe. In case of using metallic pipe as conduit proper grounding of the conduit must be done.
- Exposed cables, wherever, used, shall preferably have UV resistant jacket besides being water resistant.
- Cables for each equipment must be tagged with permanent metal tag of impregnated cable number as per drawings at MCC/C & R Panel end and equipment terminal end as well as in the mid portion of the cables at certain distances as instructed by the owner or his authorized representative.
- The loop length shall be provided for various cables as per the relevant Indian Standard.
- Cables shall be properly clamped at regular intervals with the help of non magnetic/molded fiber glass strip clamps/PVC sleeved clamps, of suitable size.
- When power cables are laid in the proximity of communication cables, the minimum horizontal and vertical separation between them may be 530 mm.

5.4TECHNICAL REQUIREMENTS FOR CABLES AND CONDUCTOR

Minimum Technical requirements are mentioned below:

- All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. All Solar DC cables for outdoor installation should confirm to IS – 17293:2020 as per MOCI order dated 24.08.2023.
- All cables shall be Fire Retardant Low Smoke (FRLS) type. The cables shall be sized based on the following considerations:
  - Rated current of the equipment
  - The voltage drop in the cable, during motor starting condition, shall be limited to 10% and during running condition, shall be limited to 3% of the rated Voltage
  - Short circuit withstand capability De-rating factor for various conditions of installations shall be considered while selecting the cable size
  - Variation in ambient temperature for cables laid in air
  - Grouping of cable
  - Variation in ground temperature and soil resistivity for buried cables
- HT cable shall be designed based on the short circuit conditions and LT cable shall be sized based on the voltage drop.
- Size of aluminium power cable shall in no case be less than 16 mm^2 and copper power cable shall not be less than 6 mm^2. ~~Where there is requirement of cables less than the above mentioned values, copper cable of appropriate size but not less than 4 mm^2 may be used.~~
- Minimum size of the control cable for CT circuit shall be 4 mm^2 and that for potential circuit shall be 2.5 mm^2.
- The cables shall be capable of satisfactory operation under a power supply system voltage variation of ± 10% and frequency variation of ± 5% and a combined frequency voltage variation of 10% (absolute sum). The cables shall have heat and moisture resistant properties.
- Conductor size of cables and wires shall be selected based on efficient design criteria. The wiring size of shall be designed such that maximum voltage drop at full power from the PV Array to Inverter(s) should be less than 1.5%. From Inverter to AC Grid interfacing panel should be less than 2.5%.
- The continuous withstand temperature shall be $90^{O}C$ and $70^{O}C$ for XLPE and PVC cables respectively and the short circuit withstand temperature shall be $250^{0}C$ and $160^{O}C$ for XLPE and PVC cables respectively.
- The Jointing Boxes shall comply in all aspects with the provision of the latest issue of relevant standards.
- The control cables shall be multi-core, colour coded, annealed, stranded high conductivity copper, single conductor, insulated with HR-PVC insulation, PVC sheathed, unarmoured FRLS type conforming to IS 1554 (part I & II)/relevant IEC. The outer sheath is of specially formulated PVC compound.
- The instrumentation cables in addition to meeting the requirements of control cables shall be provided with electrostatic shielding by aluminium tape and screening by annealed tinned copper wire.
- For connecting solar modules with solar inverter via array junction box (1.1 kV), solar inverter output with three winding transformer input (1.1 kV), three winding transformer output with 33 kV Indoor C & R Panel (33 kV) and 33 kV

Indoor C & R Panel (33 kV) with the 33 kV Switchyard (33 kV), cables of suitable size shall be provided. Grade of DC Solar cable shall be 1.9/3.3 KV.

- Number of Local Control Rooms with 33 kV Indoor C & R Panel shall be as per plant design. One number Main Control Room shall be provided adjacent to the 33 kV Switchyard, as per design. Cable Trench of suitable size as per relevant standard shall be a part of the scope of work.

5.5TECHNICAL REQUIREMENTS OF CABLE LAYING

Minimum technical requirements for cable racks and trays are mentioned below:

- The contractor shall fabricate and supply the mounting arrangement for the support and installation of all the cable trays on galvanized steel structure including channels, angles, rods etc at requisite spacing in the suspended cable trays, cable trenches. Supporting structures wherever necessary, shall be provided by the contractor.
- The contractor shall provide embedment/anchor fasteners for fixing the supporting structures.
- These supporting structures shall be fabricated from structural steel members (channels, angles and rods) of the required size.
- The vertical member of the support will be of ISRO12 threaded rod or ISMC100 channel. The horizontal member of the support will be of angle ISA 50X50X6. For the threaded rod support configuration the horizontal member shall be fixed by bolting whereas for channel configuration the horizontal member shall be fixed by welding to the channel.
- Trays shall be of ladder type. The trays shall be fabricated from Hot Rolled Carbon Mild Steel GI with minimum 80 micron galvanization thickness (conforming to IS 1079, Grade "O", of chemical composition (C, Si, Mn, S, Ph) sheet of proper thickness as per IS.
- Cable trays shall be fixed with support by hold-down clamps. The clamps shall be fabricated from MS sheet of appropriate thickness and Hot Dip Galvanized.
- The contractor shall supply various tray fittings and accessories like coupler plate with fasteners, horizontal tees, vertical and horizontal elbows, vertical and horizontal adjustable connectors required for the mentioned trays. All accessories, fittings, elbows and tees shall be Hot Dip Galvanized. The nuts, bolts and washers shall be cadmium plated or electrolytically galvanized.
- Proper earthing of the trays and continuity between tray components must be ensured by the contractor.
- The contractor shall install the cable trays in accordance with relevant standards.
- Cable drums shall be unloaded, handled and stored in an approved manner on hard and well drained surface so that they may not sink. In no case shall be drum be stored flat i.e. with flange horizontal. Rolling of drums shall be avoided as far as possible. For short distances, the drums may be rolled provided they are rolled slowly and in proper direction as marked on the drum. In absence of any indication, the drums may be rolled in the same direction as it was rolled during taking up the cables. For unreeling the cable, the drum shall be mounted on suitable jacks or on cable wheels and shall be rolled slowly so that cable comes out over the drum and not from below. All possible care shall be taken during unreeling and laying to avoid damage due to twist, kink or sharp bends. Cable ends shall be provided with sealed plastic caps to prevent damage and ingress of moisture.
- Cables shall be laid on cable trays strictly in line with cable schedule. Laying of

cable shall be done stretch-wise as follows:

a) PV array field to SMB: as per design and site condition using DWC conduit pipe through buried trench.

b) SMB to Inverter Room: on cable tray / buried cable trench as per Technical Specification- Electrical

c) All AC power cables including control cables in Control Room and Switchyard shall be laid in RCC cable trench.

- Power and control cables shall be laid on separate tiers in RCC cable trench with slab cover in line with approved guidelines/drawings. The laying of different voltage grade cables shall be on different tiers according to the voltage grade of the cables. In horizontal tray stacks, H.T. cables shall be laid on topmost tier and cables of subsequent lower voltage grades on lower tiers of trays. Single core cable in trefoil formation shall be laid with a distance of four times the diameter of cable between trefoil center lines and clamped at every two meter. All multi core cables shall be laid in touching formation. Power and control cables shall be secured fixed to trays/support with self-locking type nylon cable straps with de-interlocking facilities. For horizontal trays arrangements, multi core power cables and control cables shall be secured at every five meter interval. For vertical tray arrangement, individual multi core power cables and control cables shall be secured at every one meter by nylon cable strap. After completion of cable laying work in the particular vertical tray, all the control cables shall be binded to trays/supports by aluminium strips at every five meter interval and at every bend.
- Bending radii for cables shall be as per manufacturer's recommendations and IS: 1255. Directly Buried Cables.
- Cable trenches shall be constructed for directly buried cables. Construction of cable trench for cables shall include excavation, preparation of sieved sand bedding, riddled soil cover, supply and installation of brick or concrete protective covers, back filling and compacting, supply and installation of route markers and joint markers. Laying of cables and providing protective covering shall be as per IS: 1255. Cable shall be laid in such a systematic manner, so that in case of occurrence of fault the faulty cable can be identified in shortest possible time.
- RCC cable route and RCC joint markers shall be provided wherever required. The voltage grade of the higher voltage cables in route shall be engraved on the marker. Location of underground cable joints shall be indicated with cable marker with an additional inscription "Cable Joint". The marker shall project 150 mm above ground and shall be spaced at an interval of 30 meters and at every change in direction. They shall be located on both sides of road crossings and drain crossings. Top of cable marker/joint marker shall be sloped to avoid accumulation of water/dust on marker.
- Cable tags shall be provided on all cables at each end (just before entering the equipment enclosure), on both sides of a wall or floor crossing, on each duct/conduit entry, and at every 20 meters in cable tray/trench runs. Cable tags shall also be provided inside the C & R Panel, motor control centers, control and relay panels etc. where a number of cables enter together through a gland plate. Cable tag shall be of rectangular shape for power cables and control cables. Cable tag shall be of 2 mm thick aluminum with number punched on it and securely attached to the cable by not less than two turns of 20 SWG GI wire conforming to IS:280. Alternatively, the Contractor may also provide cable tags made of nylon, cable marking ties with cable number heat stamped on the cable tags.
- Inspection pit at suitable places to be provided for the purpose of maintenance.
- Adequate no. of spare DC cables shall be laid for the purpose of better reliability and

minimize interruption period. Spare cable to be provided by the bidder as per list of spare provided in the tender document. However additionally 5 KM solar DC cable (6 Sq. mm.) shall have to be provided.

- For each Transformer at both Incoming and outgoing side minimum one no. spare cable shall be laid for the purpose of better reliability and minimize interruption period.

5.6APPROVAL

The Detailed Design Report Submitted by the contractor to WBSEDCL must contain but not limited to the following details of the Cables and conductor and the accessories for their installation:

- Detailed design and specification of all the items.
- All necessary drawings
- Calculations for choosing cable size
- Type test reports and necessary certificates etc.
- Performance certificate from the purchaser.
- For 33kV HT Cable GTP and all other technical requirement/specification shall be in line with the specification available in; https://www.wbsedcl.in/irj/go/km/docs/internet/new_website/technicalSpecification.html.
-

Before dispatch, sample pieces of the cable shall be subjected to type, routine, acceptance and FRLS tests at the manufacturer's works as stipulated in IS 1554 (Part I)/IEC in the presence of owner or his representative. Routine tests and acceptance tests as per relevant standards shall be carried out on each type of cable in presence of the owner or his representative.

Before commissioning of complete system all cabling system shall be checked as per cable schedule and complete report shall be prepared by Contractor and shall be submitted.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Cable routing and layout drawings
- Detailed procedure adopted for the earthing of the trays
- Type test certificates for cable trays etc.

The contractor can deliver the product to the site only after receipt of such approval against their prayer in writing from WBSEDCL.

6. LT ACDB

6.1SCOPE

The scope of work under this specification covers the design, manufacture, assembly, testing at manufacturer's works, transportation, transit insurance, delivery at site, storage, installation, testing, and commissioning of indoor type following 415V LT ACDB complete with all accessories and spares. Design shall be finalised during detail designing of the plant.

6.2STANDARDS

The equipments covered under this chapter shall comply with the requirement of latest edition of following IS/BS/IEC specifications as amended up to date except where specified otherwise.

Sl. No.	Standards	Description
1	IS: 13947 (Part 1 to 5)	Specification for Low-Voltage Switchgear and Control gear.
2	IS: 10118 (Part 1 to 4)	Code of practice for selection, installation and maintenance of switchgear & control gear.
3	IS: 1248	Specifications for Electrical Indicating Instruments
4	IS: 2633	Hot dip Galvanizing
5	IS: 2705	Current Transformers
6	IS: 3156	Voltage Transformers
7	IS: 3231	Electrical Relays for Power System Protection
8	IS: 5082	Wrought Aluminum and Aluminum Alloy bars, tubes and sections for electrical purposes.
9	IS: 8623	General requirement for factory built assemblies up to 1000V.
10	IS: 8828	Circuit breakers for over current protection for household and similar installations
11	IS: 13703	Low Voltage fuses for voltages not exceeding 1000V AC
12	IS: 11353	Guide for uniform system of marking and identification of conductors and apparatus terminals.

Equipment meeting any other authoritative national or international standards that ensure equal or better quality than the standards mentioned above are also acceptable. Where the equipment conforms to any other standards than those mentioned above, salient points of difference between the standards adopted and standards mentioned above shall be brought out in the tender.

The electrical installation shall meet the requirement of Indian Electricity rules and other statutory regulations as amended up to date and relevant BIS code of practice.

6.3TECHNICAL REQUIREMENTS

- ~~Main Incoming A.C. circuits on Station service Board shall be controlled circuit breaker. Type and capacity of the breakers shall be proposed by the bidders in their bid considering the total auxiliary load of the plant.~~
- The LT ACDB shall be suitable for indoor installation in the control room.

- LT ACDB shall be placed in each control room and shall be connected to each other by means of 415 V (3 phase, neutral) transmission line along the whole area. LT switchgear at main control room shall be connected with Station Auxiliary Transformer 1 (as mentioned in the chapter "Station Auxiliary Transformer") and LT switchgear of a local control room placed at a suitable distance away from the Main Control Room shall be connected with Station Auxiliary Transformer 1 (as mentioned in the chapter "Station Auxiliary Transformer").
- The Station Service Board (SSB) shall be sectionalized in two parts through sectionalizing breakers on the bus to ensure continuity of supply to the auxiliaries in case of failure/fault on one section.
- For interconnection with various boards and all outgoing feeder circuits, 25 kA, 3 pole draw-out type MCCBs with adjustable current setting shall be provided.
- The 415V switchboards shall be metal-enclosed fixed type, free standing, self-supporting, floor mounted, indoor type, totally enclosed and compartmentalized to house the switchgear. Circuit breakers and other switchgear components shall be arranged in compartments, vertically in a multi-tier formation. All metering and protection equipment associated with a particular circuit shall be housed in separate and independent compartment earmarked for particular circuit and in the fixed portion of the vertical panel in case of breaker panels.
- Construction of all the switchboards and equipments shall conform to the latest edition of relevant IS codes.
- All cable glands and aluminum crimping type cable lugs for all power and control cables shall be in the bidder's scope of supply. Panels shall be suitable for bottom entry of cable unless otherwise specified.
- The bidder shall indicate clearly the de-rating factors, if any, employed for each component and furnish the basis for arriving at these de-rating factors duly considering the specified current ratings, ambient temperature etc.
- The equipment shall comply with all safety requirements during erection and operation as per relevant standards.
- The neutral of the incoming transformer secondary shall be connected to the neutral bus of the auxiliary boards. The neutral shall be connected to the common earthing system of the switchyard/control room.
- All auxiliary devices for control, indication, measurement and protection such as push buttons, control and selector switches, indicating lamps, Power monitors, kWh meters and protective relays shall be mounted on the front side of the respective compartment. The design shall be such that unless required for maintenance / inspection purposes, all power ON/OFF or START / STOP and relay reset operations shall be performed without opening the panel door.
- The switchboard panels shall be provided with thermostatically controlled space heaters to prevent moisture condensation.
- LED lamp fittings along with necessary isolating switches shall be provided for illumination inside the panels. Each panel shall be provided with an industrial grade power socket as well.
- The 415V bus shall be of suitable cross-section so as to be able to carry the required continuous and short circuit currents within the limits of temperature rise for the site conditions.

- Control and selector switches shall be rotary type with escutcheon plates clearly marked to show the function and positions. The switches shall be of sturdy construction suitable for mounting on panel front.
- AC Distribution Board is to be provided in the main switchgear room and in the particular local control room having auxiliary transformer as per requirements.
- Instrument transformers shall be provided and shall conform to the relevant standard.
- All protective device shown in the drawing and others required for operation of the system as per the specification shall be included in the scope of supply.
- All instruments and meters shall be suitable for operation under the climatic conditions prevailing at site. The instrument cases shall be dust-proof, water tight, vermin proof, specially constructed to adequately protect the instruments against damage or deterioration due to high ambient temperature and humidity.
- Watt hour meter shall be suitable for 3-Phase, 4-wire unbalanced system and shall comply generally with the requirements of relevant IS code and shall be of first grade for the purpose of accuracy classification. Watt hour meters shall be provided in each LT ACDB.
- Panels shall be supplied completely wired internally to equipment and terminal blocks for connection to external cables entering the panel from the bottom. Terminal blocks shall be complete and provided with necessary terminal accessories for cable ends.
- Engraved PVC labels shall be provided on incoming and all outgoing breaker compartments, the exact details of legend to be engraved shall be furnished later to the contractor.
- All vertical cubicles shall be connected to earth bus bar running throughout the length of the switchboard. All doors and movable parts shall be connected to the earth-bus with flexible copper connections. Provision shall be made to connect the earthing bus bar to the main earthing grid at two ends. All non-current carrying metallic parts of the mounted equipment shall be earthed. Earthing bolts shall be provided to ground cable armours.
- Finishing work like painting etc. for ACDB should be as per relevant IS.

6.4APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the LT Switchgear:

- Detailed specification of all the items.
- All necessary drawings
- All necessary test certificates and approvals etc.
- GTP and all other technical requirement/specification shall be in line with the specification available in; https://www.wbsedcl.in/irj/go/km/docs/internet/new_website/technicalSpecification.html.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Instructions for installation and operation, manual
- Electrical diagrams
- Safety precautions

- Detailed schematics of all power instrumentation and control equipment and subsystems along with their interconnection diagrams. Schematics shall indicate wiring diagrams, their numbers and quantities, type and ratings of all components and subsystems etc

  The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

7. DC BATTERY, ~~BATTERY CHARGING EQUIPMENT~~ & DCDB

7.1 SCOPE

The scope of work under this specification covers the design, manufacture, assembly, testing at manufacturer's works, transportation, transit insurance, delivery at site, storage, installation, testing, and commissioning of D.C equipment comprising of 30V D.C Battery Bank of suitable designed capacity complete with battery charging equipment, D.C. Distribution Board and other auxiliary equipments.

The scope shall include all associated devices, components, relays, contactors, switches etc. required for satisfactory operation of the DC equipment as per the proposed logic control scheme.

The scope of supply shall also include necessary spares required for normal operation & maintenance of DC equipments for a period of 05 (Five) years and special tools & plants required for erection & maintenance.

Corresponding parts of all the equipments & spares shall be of the same material & dimensions, workmanship & finish and shall be interchangeable. All the material & workmanship shall be of suitable commercial quality as have proven successful in their respective uses in similar services & under similar condition.

7.2STANDARDS

The equipments covered under this chapter shall comply with the requirement of latest edition of following IS/BS/IEC specifications as amended up to date except where specified otherwise.

Sl. No.	Standards	Description
1	IS: 1651	Stationary cells & batteries, lead acid type (with tubular positive plates)
2	IS: 266	Battery grade Sulphuric Acid. (Battery electrolyte)
3	IS: 1069	Water for storage batteries
4	IS: 1146	Rubber & Plastic containers for lead Acid storage batteries
5	IS: 1248	Electrical Indicating Instruments
6	IS: 13947	Low voltage switchgear and control gear
7	IS: 3895	Mono-crystalline semi-conductor rectifier cells & stacks
8	IS: 8320	General requirement and methods of tests for lead acid storage batteries
9	IS : 6071	Synthetic separators for lead acid batteries
10	IS : 8623	Factory built assemblies of switchyard and control gear for voltage up to including 1000 V AC and 1200 V DC (Part 1 to 3)
11	IS 4540	Non-crystalline semi-conductor rectifier assemblies & equipment

Equipment meeting any other authoritative national or international standards that ensure equal or better quality than the standards mentioned above are also acceptable. Where the equipment conforms to any other standards than those

mentioned above, salient points of difference between the standards adopted and standards mentioned above shall be brought out in the tender.

7.3 GENERAL REQUIREMENTS

Minimum general requirements for the DC Battery, Battery charger and DC Distribution Board are mentioned below.

- Lead acid tubular type battery of required rating shall be provided at Main Control Room and each Local Control room. Battery Bank at Main Control Room shall be 30V and Battery Bank at Local Control Rooms shall be selected based on the Control Voltage required for closing and tripping of 33 kV Indoor type VCBs. 10 hours continuous discharge shall be considered for sizing the battery.
- One float charger and one float cum boost chargers shall be provided to maintain constant voltage at D.C. bus bars while supplying the continuous load in addition to keeping the battery on float charge.
- In case of sudden D.C. requirements due to failure of A.C. supply or charger itself, the battery shall be capable of meeting the system load demand. In case of failure of float charger supplying the continuous DC load, the affected battery charger shall get disconnected automatically from the DCDB and the complete D.C. load requirements shall be met by the float charger of float cum boost charger unit.
- The charger shall be protected against overloads by having suitable characteristics so that all loads in excess of the capacity of the charger would be transferred to the battery.
- In the event of failure of A.C. supply, the battery shall meet the complete D.C. requirements. After the discharge of battery to a considerable extent, the boost charger on restoration of A.C. supply shall recharge the battery in a short period. During the period of boost charging, the D.C. load requirements of power station shall also continue to be met.
- The distribution board with necessary switch and interlock, if any, shall be provided for distributing the D.C. power for the control & protection circuits, emergency D.C. supply for essential lighting etc.
- The bidder may give his recommendation on the scheme of operation of battery, battery chargers as described in the specifications. However, the decision of the owner in this regard shall be final and bound to the bidder/contractor.
- The battery shall be capable of delivering the rated output at the minimum temperature of -3°C and maximum temperature of +40°C.
- The battery shall be mounted on the two tier wooden racks supplied along with the battery. Each cell as well as its locations shall be numbered for proper record of maintenance operations. Battery should be placed on the porcelain base kept on the wooden rack.
- The battery shall be connected to D.C. distribution board by single core cables laid above ground. Suitable terminal arrangement with glands shall be provided for this purpose.
- Battery room shall be painted with acid proof paint. Exhaust fans should be provided in the battery room. Contractor shall submit the details of the same to the owner.
- The ripple content in the D.C. current shall be less than 1%.
- The float charger unit shall be capable of supplying continuous D.C. load and trickle charge the battery.
- Necessary alarm and indication shall be provided with the DC System and also in the annunciation window of the Battery Charger.
- Necessary terminals with lugs for earthing the charger panels with two distinct separate earthing for each panel shall be provided. In addition, separate terminals for earthing

of equipment shall be provided. The charger panels shall have space heaters.

- Compression type cable glands of suitable rating for PVC unarmoured cable, suitably mounted in the panel for cable entry from the bottom for A.C. & D.C. supplies shall be provided.
- Type of cell, cell terminal, containers and installation of battery, chargers, inverter, DC Distribution Board, cables etc. should conform to the latest edition of relevant Indian Standard.
- During installation of battery, charging & discharging and charging is to be done proper installation procedure.

7.4 TECHNICAL REQUIREMENTS

Minimum technical requirements for the DC Battery, Battery charger and DC Distribution Board are as following.

- The battery shall be made of lead-acid cells with tubular type plates conforming to latest issue of IS 1651. The battery cells shall be high discharge performance (HDP) type.
- The capacity of 30V D.C. batteries based on 10 hours discharge rate shall be selected to fulfill the plant's requirement. The contractor shall propose the same to the owner and decision of the owner will be final and bound to the contractor.
- The battery shall normally remain under floating condition with the charger supplying the normal continuous load. However, the battery shall be capable of supplying the load without fall of terminal voltage per cell below 1.85V (92.5% of rated voltage).
- The number of cells of the 30volt battery bank at Main Control Room and required voltage at Local Control Room shall be chosen to suit the following conditions.
    - Nominal floating voltage per cell shall be between 2.15 and 2.21 V.
    - The voltage of each cell under floating conditions shall be of optimum value for its performance and maintenance in a healthy condition.
    - The voltage of the battery after meeting the D.C. load cycle shall not be less than 90% of the rated voltage. The manufacturer shall ensure safe operation of the battery after the aforementioned end voltage.
    - The voltage across the load shall not exceed 110% of rated value under charging conditions of the battery. To achieve this condition under quick charging, a blocking diode may be incorporated by the supplier in the charging equipment.
- The bidder shall clearly justify the choice of number of cells in the tender on the above lines and furnish any clarifications required by the owner.
- All cell terminals shall have adequate current carrying capacity and shall be of lead-alloy or lead-alloy reinforced with copper core inserts. Cell terminal posts shall be equipped with acid resisting connector bolts and nuts.
- The electrolyte shall be of battery grade sulphuric acid. The battery shall be transported dry.
- The charging equipment shall preferably employ solid state full wave rectifier in a 3 phase full wave bridge circuit with suitable filter circuit of AC ripples, suitable for operation in conjunction with static voltage regulator. A.C. and D.C. Circuit breakers with thermal overload and instantaneous short circuit releases shall be provided on input and output sides of chargers respectively.
- Capacity of the float charger and the boost charger in the float cum boost charger shall be sufficient to meet the system requirement. Contractor shall submit the details to the owner.

- The charger shall be capable of providing the floating voltage between 2.15 V to 2.21 V per cell with the variation of not more than +1% irrespective of input supply voltage fluctuations within +/-10%, frequency fluctuation within +/-5 % throughout its ampere rating with ambient air temperature range of -3^{0}C to 40^{0}C.
- The DC Distribution Board (DCDB) shall be free standing, self-supporting and floor mounting type. It shall be totally enclosed and compartmentalized. DCDB shall be made as per relevant Indian Standard.
- The Emergency Lighting Board supplying the emergency lighting requirement of the power house at A.C shall have an arrangement so that automatic changeover to emergency lighting in case of A.C. failure, is achieved through an inverter of suitable capacity. Normally, the inverter shall run on AC. supply. In the event of failure of AC, the inverter shall automatically switch-over to DC supply and feed the selected emergency loads (lighting loads) at 230 V AC. On restoration of AC supply, the inverters load will automatically return to AC.
- The DC system shall have necessary control & protection arrangement which include but not limited to the following.
    - Auto/Manual selector switch
    - Digital D.C. voltmeter, ammeter
    - A.C. failure alarm
    - Ground fault relay and its annunciation
    - Double pole D.C. contactor of suitable capacity for annunciation
    - Triple pole A.C. contactor of suitable capacity for ON/OFF operation
    - MCCB and DC contactor of suitable capacity in output circuit of each charger to suit the operation requirements.
    - Indicating lamps, as required
    - Triple pole, A.C. circuit breaker of sufficient capacity to meet system requirements & capacity with overload and short circuit release for incoming A.C. supply to charger panel
    - MCB/MCCBs for A.C. supply to individual chargers
    - A.C. under voltage relay
    - A.C. voltmeter, ammeter etc.
- Nearest local control room from the main control room should be connected with 30V DC from Battery Bank DCDB.
- 30V AC/DC converter is to be provided in each isolated C & R Panel for operation of circuit breaker/isolator as and where required. Power required in ACDB/DCDB for illumination, control system etc. for each control room should be collected from 415 V (3phase+N) transmission line with necessary cables and protection.

7.5APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the DC system:

- Detailed specification of all the items.
- Necessary Drawings
- Test Certificates etc.
- GTP and all other technical requirement/specification shall be in line with the specification available in; https://www.wbsedcl.in/irj/go/km/docs/internet/new_website/technicalSpecification.html.

Prior to the delivery of the product, the contractor shall submit but not limited to the following documents:

- Guarantees
- Instructions for installation and operation, manual
- Detailed schematic, connection and control wiring diagrams etc.

The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

8. EARTHING SYSTEM

8.1SCOPE

The scope of work under this specification covers the design, supply, transportation, delivery at project site, transit insurance, storage at site, erection, testing & commissioning of earthing system along with necessary materials

8.2STANDARDS

The grounding system shall conform to the requirement of following standards.

Sl. No.	Standards	Description
1	ANSI/IEEE: 80 –2000	Guide for safety in AC Substation Grounding
2	CBIP Publication: 223	Design of Earthing Mat for High Voltage substation
3	IS: 3043	Code of Practice for Earthing Indian Electricity Rules

8.3OBJECTIVE

The grounding system shall be designed with the following objectives:

- To provide low impedance path to fault currents, during ground faults, to ensure prompt and consistent operation of protective devices to effect isolation
- To keep the maximum voltage gradient during ground faults along the surface inside and around the switchyard, PV array yard, control rooms etc. within safe limits
- To protect the life and property from electrical shocks due to over voltage
- To stabilize circuit potentials with respect to ground and limit the overall potential rise

8.4TECHNICAL REQUIREMENTS

Minimum technical requirement of the earthing system is mentioned below.

- The earth resistance should be less than 1 Ω.
- Suitable number of earthing pit shall be provided at the array field.
- Design and installation of the earth mat and other associated system shall confirm to IS: 3043 and IEEE Std P80 with lates amendments.
- The earthing for solar field and power distribution system shall be made with GI pipe of suitable size including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS: 3043. The Mounting structure shall be grounded properly using GI strips and maintenance free earthing kit.
- Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- The earth conduction shall run through GI pipe partly buried and partly on the surface of the control room building.
- The complete earthing system shall be mechanically & electrically connected to provide independent return to earth.
- All three-phase equipment shall have two distinct earth connections.
- Along the cable trays suitable size of GI Flat shall be provided inside the control room.

- For each earth pit, necessary Test Point shall have to be provided.
- The earthing system shall be connected to the following.
  - Solar modules with suitable number of earthing pit at the solar array field
  - The neutral point of each system/equipment
  - Equipment framework and other non-current carrying parts
  - Frames of panels & cubicles
  - Metallic structures of switchgear, cable racks, casing of cable boxes
  - Equipment supporting Steel structures
  - All extraneous metallic frame work not associated with equipment
  - The earth point of lightning arrestors; voltage transformers and lightning conductors through their permanent independent earth electrodes.
  - Fence
- For equipment connection to mat/riser, 50 mm x 6 mm or higher size GS flat shall be used.
- The conductor shall be of adequate cross-section to safely withstand the system fault current for time duration of fault clearance by the remotest/back up protective system.
- Sufficient allowance needs to be provided for corrosion of the embedded conductor on account of chemical properties of soil and also due to galvanic action with other embedded systems.
- For determination of the size of the conductor, the minimum value of earth fault current shall be taken as 25 kA, duration of fault current shall be considered as 3 second. The extra allowance of minimum 20% to take care of corrosion shall be added to arrive at final conductor size.
- For designing of the earth mat for 33kV switchyard, the material of ground mat conductor shall be MS Flat and that of risers emanating from ground mat shall be GS flats. Soil resistance of the site is available in the soil report.
- Lightning shield wire design of switch yard shall be done using rail pole.

8.5APPROVAL

The successful bidder shall carry out the earth resistance measurement at the site and they need to submit the measurement report to WBSEDCL.

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the earthing system:

- Detailed specification of all the items.
- Soil resistivity measurement data
- Necessary calculations and drawings etc.

The successful bidder required to produce schematic diagram of the earthing system and the proposed locations for earth mat as per relevant standard with the Detailed Design Report.

All drawings and calculations submitted by the contractor will be subjected to approval of the WBSEDCL.

9. CONTROL, MONITORING AND DATA ACQUISITION SYSTEM

9.1SCOPE

The scope of work under this specification covers the design, engineering, manufacture, testing at manufacturer's works, transportation, transit insurance, delivery at project site, storage at site, erection, testing at site and commissioning of Control, monitoring & Data Acquisition system comprising of computers, VDU, key board/mouse, PLC's, input and output relays, meters, fields sensors, panels/cubicles for housing above equipment/devices, power supplies, transducers, converters, wiring etc to make the system complete.

9.2REQUIREMENTS

- The automatic control panels shall be located in each control room. The control panels shall be provided with local automatic selection. On local automatic selection, control will be transferred to control panels located in local control rooms from where unit can be started by single push button control. Control panel should be equipped with seamless data transmission via Modbus TCP protocol to remote interface Master SCADA centre at ALDC, WBSEDCL. To adhere this data transmission to ALDC, SIM based/ or additional modem need to be integrated with existing ALDC system.
- All necessary support as and when required to integrate the plant data with SCADA at ALDC shall be adhered by the EPC Agency within the contract value.
- The SCADA work station and push button control panel shall be interlocked by means of hardwired and software (Logic) to ensure smooth and safe operation of the plant.
- All pre-synchronization checks shall be made to ensure normal and safe operation of the machine. Detailed philosophy shall be submitted by the contractor.
- PTZ (Pan-Tilt-Zoom) outdoor camera covering the whole plant to be deployed with night vision and central monitoring through 55" LED monitor/TV of reputed make such as Sony, Samsung, LG etc.
- System shall acquire on continuous basis the parameters of PV array, like DC current of string, DC voltage of each combiner box etc., Parameters of Solar Inverter like Power at the input of each inverter, Power at the input of each inverter, phase current, voltage, PF, MVAR, MW, Frequency etc., similar parameters of Generator Step-up and auxiliary Transformers etc.
- The Monitoring system shall perform String level monitoring for trouble free operation and maintenance of the plant. System shall indicate these on VDU Mimic alongside relevant device.
- System shall monitor and indicate on VDU status of all electrical devices including 33 kV VCB.
- Shall provide mimics of main single line diagram, Auxiliary SLD and DC SLD in colour. The parameters as above shall be displayed by the side of respective device in proper units of measurement.
- The control & monitoring system for the generating units shall be microprocessor based digital control.

- The data logger shall have reliable battery backup and data storage capacity to record all sorts of data simultaneously round the clock.
- Inverters should be integrated with SCADA and provision of Data logging should be there. Logger should have the provision of recording the data of solar insolation, PV Module 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.
- Plant based Remote Monitoring system must be compatible with data logger. The other required accessories, hardware and compatible software shall have to be provided as an integrated part of the system to monitor the real time data through the server. The Data logger shall continuously send data to the server. Plant based Data logging system may be provided with special software (minimum 10 users). Up gradation of the software, if any, shall be done by the contractor. The server shall not be provided by WBSEDCL or end-user.
- In case the data cable to be laid in the array field, SPD (surge protection device) suitable for communication network, as much number at suitable location are required must be provided with the system.
- The Plant based monitoring system must have the graphical representation of the data shall include but not limited to the following:

SI. No.	Operating Parameter	Desired specification
1	Input data	• PV Power • PV Energy
2	Meteorological data	• Insolation (inclined on the plane of module as well as horizontal) • Module Temperature • Ambient Temperature • Wind Velocity
3	Output data	• Inverter Export Power • Inverter Export energy

- All data shall be recorded chronologically date wise. The data file should be MS Excel/XML/any readable form compatible and should have the facility of easy downloads.
- IT grade server may be installed including provision for back up data at least for 05 years. 32 GB RAM , 5 TB Seta HDD (3 nos.) , Data redundance , Raid 5 with 22 " LED monitor.
- The server must have the features but not limited to the following:
  - Windows Server of latest version.
  - CPU quad-core or hexa-core Intel i9/Thread ripper/Ryzen 9.
  - GeForce GTX GPU compatible with OpenGL 3.2 and 2 GB RAM.
  - Hard disk: 512GB SSD and 5 TB HDD.
  - Very Large projects (1000 - 2000 images at 14 MP): 32 GB RAM, 120 GB SSD Free Space.
  - MySQL for database.
  - Gigabit dual Ethernet port.
  - Dual power supply.
  - Reputed licensed Anti-Virus – 5 Years
- **MCR & LCR RTU enclosure panel shall be Outdoor, IP55, rust proof, dust proof FRP based with following minimum specifications:**

MCR RTU design requirement.
MCR RTU should be with dual processor
MCR RTU should be redundant

MCR RTU should be with Min 8 MB Programming memory ,with option for add on storage memory
MCR RTU should support high level programming languages like C#,C++ , JAVA, Python ,MATLAB, Simulinks and also comply to IEC 61131 -3 programming standards
I/O expansion for MCR RTU should be on Ethernet based protocol.
MCR RTU should have minimum two on board Ethernet ports.
MCR RTU should be certified for ISA /IEC 62443 -4- 1 and IEC 62443 -4-2
MCR RTU should have built in with TPM chip security management.
MCR RTU Should support HTTP,HTTPS,SFTP,SNMP,OPC UA ,IPsec
It shall be capable of supporting wide range of field protocols to communicate with different field equipment not limited to IEC 61850 ,IEC 60870 -1-101/104
It shall have local storage for a minimum of 2 weeks in case of network failure/ data communication interruption between the SCADA server and MCR controller
Configuration of the MCR controllers to interface with the field devices shall be through a web-based interface.
It should send the data collected, parallelly to plant SCADA machine and Cloud application.
MCR Controller shall have the capability to poll Modbus TCP data from multiple TCP slaves
MCR RTU should support min 16 Ethernet TCP/IP socket
MCR Controllers shall be capable of controlling the breakers (On/Off) and the inverters (On/Off) through Modbus writing option
It shall have the required interface from the SCADA system for Modbus writing to set various power control modes through the inverters and other devices over TCP/IP and also through hardwired connectivity.
MCR RTU must have latest functions like MQTT, SSH, MODBUS TCP, IEC61850, IEC 60870-5-101/104.
Power Supply and mounting of the MCR controllers in the SCADA panels should be designed to operate in non-air-conditioned environment

LCR RTU design requirement.
ICR RTU should be with Min 512 KB Programming memory ,with option for add on storage memory
ICR RTU should have minimum two on board Ethernet ports.
ICR RTU Should be a Modular type with option for expansion upto 63 I/O module
ICR RTU should support high level programming languages complying to IEC 61131 -3 programming standards
ICR RTU Should be SNTP and SNMP Enabled
ICR RTU should support OPC DA and UA

ICR RTU should support HTTP , Web enabled
It shall have local storage for a minimum of 2 weeks in case of network failure/ data communication interruption between the SCADA server and MCR controller
ICR RTU must have latest functions like MODBUS TCP, Modbus Serial ,
ICR RTU Should support Min 8 Ethernet TCP/IP Sockets
ICR RTU should have capabilities to push data to SQL data base
RS 485 Port should be integral part of RTU and third party gateway servers should not be used for serial communication (Modbus RS485/RS232)
External SPD for RS 485 port should be provided
ICE RTU should have capabilities to push data to SQL data base
Power Supply and mounting of the ICR controllers in the SCADA panels should be designed to operate in non-air-conditioned environment

- **Firewall :** HW Appliance with 4E + 1 SFP port, Flash memory + Base Licence (incl. FW, VPN & Wireless) for unlimited users + power Cable complete with Xstream Protection – Base Firewall, Network Protection, Web Protection, Zero day protection Enhanced Support for 60 MOS.

9.3 APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the data acquisition and monitoring system:

- Detailed scheme
- Details of panels, metering system
- Necessary drawings for the scheme etc.

Drawings and scheme submitted by the contractor will be subjected to approval of the owner.

10. MISCELLANEOUS

10.1GENERAL SCOPE

The scope of work under this specification covers the following systems.

- ~~Illumination system~~
- Fire protection system
- Ventilation system
- Air conditioning system
- ~~Drinking water~~
- Weather station
- Communication system
- Signage
- Surveillance System

10.2ILLUMINATION SYSTEM

10.2.1SCOPE

The scope of work under this specification covers design, manufacture, assembly, shop testing, delivery, site erection, testing & commissioning of Illumination system comprising of main Illumination switchboards, distribution boards, sub distribution boards, switchboards, lighting fixtures, convenience and power outlets, conduits & fittings, cabling, outdoor lighting including mounting structures & poles, LED etc. for control rooms, security cabin, watch tower, access road, across the fence (maximum 15 m between two adjacent lamps).

The illumination system shall be designed as per relevant Indian Standard / Guideline for different location of the plant. The lighting arrangement should be LED Based.

The scope of supply shall also include necessary spares required for normal operation & maintenance of illumination equipment for a period of 5 (five) years & special tools & plants required for erection & maintenance. Corresponding parts of all the equipments & spares shall be of the same material & dimensions, workmanship & finish and shall be interchangeable.

10.2.2STANDARDS

The material, equipment and its installation under the scope shall comply with all applicable provisions of the latest Indian standards and codes of practice. Some of the relevant standards are given below:

Sl. No.	Standards	Description
1	IS: 3646	Code of practice for interior Illumination (Part I, II, III)
2	IS: 6665	Code of Practice for Industrial Lighting
3	IS: 732	Code of Practice for Electrical wiring installations
4	IS: 9537	Conduits for Electric installations
5	IS: 2418	Tubular fluorescent lamps for general lighting service
6	EN 61347-2-13	Particular requirements for D.C. or A.C. supplied electronic control gear for LED modules
7	EN 62384	D.C. or A.C. supplied electronic control gear for LED modules
8	EN 61000-3-2	Electromagnetic compatibility (EMC). Limits for harmonic current emissions (Equipment input current < 16 A per phase)

9	EN 61000-3-3	Limitation of voltage fluctuation and flicker in low voltage supply systems for equipment with rated current < = 16 A

The installation shall generally be carried out in conformity with the requirements of Indian Electricity Act 1910 (latest Amendment) & Indian Electricity Rules.

10.2.3REQUIREMENT

The lighting system for outdoor and indoor areas of Solar Power Plant shall be designed in such a way that uniform illumination is achieved.

In outdoor yard equipment / bus bar areas and the peripheral wall are to be illuminated and luminaires shall be aimed for clear view.

10.2.4LIGHTING LEVELS

The complete switchyard shall be lightened with an average illumination level of 100 lux.

Lighting in other areas such as control room, office rooms and battery room & other areas (i.e. street light) shall be such that the average LUX level to be maintained shall be as under:

Sl No.	Area	LUX
1	Control Room and equipment rooms	500
2	Office	530
3	Communication Room	530
4	Battery & other rooms	150
5	Other areas including periphery wall	20
6	H – pole and metering point	20
7	Outdoor switchyard including road	30
8	Road within campus including colony Area	30
9	Auxiliary Buildings like Pump room and other houses	150
10	ACDB- DCDB room/Store / Store Office	150
11	Conference room	530
12	Dining room/Kitchen	150
13	Maintenance room	150
14	Stairs	100
15	Toilet	100
16	Corridor	100
17	Any other spot where high level of illumination required	150

10.2.5EMERGENCY LIGHT POINTS

Light points using LED lamps of 15-20 W (at 240 V) shall also be provided as given below:

- Control room and equipment room – 4 Nos.

- Battery room – 1 No
- Office – 1 No
- Corridor – 1 No
- Local Control Room – 2 Nos.

These lights shall operate on AC/DC changeover supply from the DC distribution Board. Separate wiring and distribution board shall be provided from these lights.

10.2.6APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the illumination system:

- Detailed scheme and specification
- Illumination calculations for arriving at the number of lighting fixtures for different areas & rooms considering the required lux level as per relevant IS Code.
- Necessary drawings etc.

Drawings and scheme submitted by the contractor will be subjected to approval of the owner.

The contractor can deliver the product to the site only after receipt of such approval against their prayer in writing from WBSEDCL.

10.3FIRE PROTECTION SYSTEM

10.3.1SCOPE

The scope of work under this specification covers design, engineering, quality assurance, manufacture, shop testing, transport, transit insurance, delivery to site, storage at site, site erection, testing & commissioning of fire protection system (fire extinguisher (type shall be selected as per requirement), fire buckets, fire alarms at all control rooms etc.) complete with all accessories.

The scope of supply shall also include necessary spares required for normal operation & maintenance of illumination equipment for a period of 5 (five) years & special tools & plants required for erection & maintenance. Corresponding parts of all the equipments & spares shall be of the same material & dimensions, workmanship & finish and shall be interchangeable.

10.3.2STANDARDS

All equipment covered under this section will conform to the latest edition of following Indian Standards:

Sl. No.	Standards	Description
1	IS: 3034	Code of Practice for Fire Safety of Industrial buildings: Electrical generating and distributing stations.
2	IS: 3844	Code of Practice for installation of internal fire hydrants in multi-storied buildings
3	IS: 1646	Code of Practice for fire safety of buildings (General) Electrical Installations
4	IS: 2878	Specification for fire Extinguishers – Carbon dioxide type
5	IS: 2171	Specification for fire Extinguishers – Dry Powder type
6	IS: 933	Specification for fire Extinguishers – Foam type
7	IS: 2175	Specification for heat sensitive fire detectors for use in automatic electrical fire alarm system
8	IS: 2189	Code of Practice for installation of automatic fire alarm system using heat sensitive type fire detectors

10.3.3APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the fire protection system:

- Detailed scheme and technical specification
- Placing and type of fire extinguisher with justification
- Necessary drawings related to the system etc.

Drawings and scheme submitted by the contractor will be subjected to approval of the owner.

The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

10.4VENTILATION SYSTEM

10.4.1SCOPE

The scope of work under this specification covers design, manufacture, shop testing, supply, transportation, delivery, storage at site, erection, testing and commissioning of ventilation system complete with all accessories at each control rooms, store room etc.

The Scope shall include supply of all blower fans, GS ducting, air plenum, exhaust fans air dampers etc as required to make the ventilation system complete in all respects for satisfactory operation.

The scope of supply shall also include necessary spares required for normal operation & maintenance of ventilating equipments for a period of 5 (five) years and special tools & plants required for erection & maintenance.

Corresponding parts of all the equipments & spares shall be of the same material & dimensions, workmanship & finish and shall be interchangeable. All the material & workmanship shall be of suitable commercial quality as have proven successful in their respective uses in similar services & under similar condition.

10.4.2STANDARDS

The ventilating equipment shall comply with the requirement of the latest edition of relevant Indian standards or equivalent British Standards. Some of the relevant standards are given below:

Sl. No.	Standards	Description
1	IS : 3103	Code of Practice for industrial ventilation
2	IS : 2312	Specifications for propeller type A.C. Ventilating fans.
3	IS: 4894	Centrifugal fans

10.4.3APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the fire protection system:

- Detailed scheme and technical specification
- Calculations showing air requirements at various locations
- Necessary drawings etc.

The successful bidder required to produce all necessary test certificates and approvals of the product as per relevant standard with the Detailed Design Report.

Drawings and scheme submitted by the contractor will be subjected to approval of the owner. The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

10.5AIR CONDITIONING SYSTEM

10.5.1SCOPE

The scope of work under this specification covers design, manufacture, testing, supply, transportation, transit insurance, delivery, storage at site, erection, testing and commissioning of Air conditioning system with control and accessories at the operator's work station, SCADA room and Conference/seminar room at main control room building.

10.5.2STANDARDS

Equipment shall conform to the latest Indian standards or equivalent British Standards.

Sl. No.	Standards	Description
1	IS: 659	Safety code for Air conditioning (AC)
2	IS: 660	Safety code for Mechanical Refrigeration
3	IS: 655	Metal Air ducts

10.5.3 Specification

Five Star rated split Inverter AC of reputed make and 1.5 Ton capacity such as Daikin / O - General/Mitsubishi shall be supplied. Stabilizer and required fittings for proper running of AC to be provided. Approval of AC capacity shall be accorded after submission of requisite documents.

10.6DRINKING WATER

10.6.1SCOPE

The scope of supply under this section shall cover the design, manufacture, shop testing, supply, transportation, delivery, storage at site, erection, testing and commissioning of deep tube well, pump, water purifier unit and other related plumbing arrangement and accessories etc. for drinking water supply for the personnel at the power house.

10.6.2STANDARDS

The whole system shall conform to the latest edition of relevant Indian Standard.

10.6.3APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the water purification unit:

- Detailed Technical specification
- Necessary drawings etc.

Specification submitted by the contractor will be subjected to approval of the owner. The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

10.7WEATHER STATION

10.7.1SCOPE

The scope of supply under this section shall cover the design, manufacture, shop testing, supply, transportation, delivery, storage at site, erection, testing and commissioning of weather station comprising of

- Temperature sensor with radiation protection
- Temperature sensor in the module
- Solar radiation sensor (Inclined on the plane of module as well as horizontal)
- Sensor which indicates the speed and direction of the wind etc.

The monitoring system shall be linked to the weather station by means of its

digital/analogue inputs, allowing the datas collected by the sensors stored through software.

10.7.2STANDARDS

The equipments shall conform to the latest edition of relevant Indian Standard.

10.7.3APPROVAL

The Detailed Design Report submitted by the contractor to WBSEDCL must contain but not limited to the following details of the equipments of weather station:

- Detailed Technical specification
- Necessary drawings etc.

Specification submitted by the contractor will be subjected to approval of the owner. The contractor can deliver the product to the site only after receiving such approval against their prayer in writing from WBSEDCL.

10.8COMMUNICATION SYSTEM

Communication system at the Main Control Room (telephone sets) and required number of walkie talkies for security personnel and main control room shall be provided by the contractor.

10.9SIGNAGE

Project information Signage:

- The Signage shall be provided with details of the project as approved by WBSEDCL.
- The font size on the signage has to be big enough so that everyone can read it easily.
- This signage will be outdoor type.
- The Signage shall be installed two (02) prominent place of each project location.

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.

10.10 SURVEILLANCE SYSTEM

The specification covers design, supply, erection, testing and commissioning of the complete surveillance system including cameras, Network Digital video recorder, computer with peripherals, mounting arrangement for cameras, cables etc. for effective visual monitoring of total power plant premises.

The number of cameras and their locations shall be decided to monitor at least:

- All the Transformers.
- The operation of each and every isolator of the complete yard.
- All other Major Equipments (such as CB, CT, PT, SA etc.)
- Key areas of control room cum administrative building, Indoor C&R panel room etc.
- All the Entrance doors of Control Room Building, Pump House, Sub-Station main gate, gates of switchyard, colony entrance gate etc.

The cameras can be mounted on structures, buildings or any other suitable arrangement to be provided by the contractor.

10.10.1TECHNICAL REQUIREMENTS

The system shall use video signals from various types of indoor/outdoor CCD colour cameras installed at different locations, process them for viewing on workstations/monitors in the control Room and simultaneously record all the cameras after compression using MPEG 4 or better standard and streamed over the IP network. Mouse-Keyboard controllers shall be used for Pan, Tilt, Zoom, and other functions of desired cameras. The System shall provide sufficient storage of all the camera recordings for a period of 90 days or more @ 25 FPS, at 4 CIF or better quality using necessary compression techniques. It shall be ensured that data once recorded shall not be altered by any means. The recording resolution and frame rate for each camera shall be user programmable. The provision for transfer of recorded data to separate external media shall be ensured.

The surveillance CCTV System shall operate on 230 V, 50 Hz single-phase power supply.

10.10.2SYSTEM REQUIREMENTS

- Camera with external encoder shall be used for image capture.
- Indoor cameras shall be either with fixed focal length lens or with Pan/Tilt & Zoom lens as per site requirement. All outdoor Cameras shall be Day/Night PTZ Dome type cameras. At least four number PTZ Dome type cameras have to be installed.
- Housing of cameras meant for indoor use shall be of IP 42 rating whereas outdoor camera housing shall be of IP 66 or better rating.
- All camera recordings shall have Camera ID & location/area of recording as well as date/time stamp. Camera ID, Location/Area of recording & date/time shall be programmable by the system administrator with User ID & Password.
- System to have facility of additional camera installation beyond the originally planned capacity.
- System shall be triplex i.e. it should provide facility of simultaneous recording, playback & network operation.
- The offered system shall have facility to export the desired portion of clipping (from a desired date/time to another desired date/time) on CD or DVD. Viewing of this recording shall be possible on standard PC using standard software like windows media player etc.
- System shall have provision for remote monitoring.

The equipment should generally conform to Electromagnetic compatibility requirements for outdoor equipment in EHV switchyards. Type test reports to establish compliance with this requirement shall be submitted during detailed engineering.

10.10.3VIDEO SURVEILLANCE APPLICATION SOFTWARE

- Digital video surveillance control software should be capable to display and manage the entire surveillance system. It should be capable of supporting variety of devices such as cameras, video encoder, Servers, NAS boxes/Raid backup device etc.
- Surveillance control software should be compatible with MS Windows operating system.
- The software should have inbuilt facility to store configuration of encoders and cameras.
- The software should Support flexible 1/2/4/8 Windows Split screen display mode or scroll mode on the PC monitor.
- The software should be able to control all cameras i.e. PTZ control, Iris control,

auto / manual focus, and color balance of camera, Selection of presets, Video tour selection etc.

- There must be a single encoder for each camera.
- The software should have user access authority configurable on per device or per device group basis. The user shall have the facility to request the access and control of any camera for a pre-determined time period. Control of camera shall be released automatically after expiry of the pre- determined time period.
- The system shall provide user activity log with user ID, time stamp, action performed, etc.
- The users should be on a hierarchical basis as assigned by the administrator. The higher priority person can take control of cameras, which are already being controlled by a lower priority user.
- It should have recording modes viz. continuous, manual, or programmed modes on date, time and camera-wise. All modes should be disabled and enabled using scheduled configuration. It should also be possible to search and replay the recorded images on date, time and camera-wise. It should provide onscreen controls for remote operation of PTZ cameras. It should have the facility for scheduled recording. Different recording speeds (fps) and resolution for each recording mode for each camera should be possible.
- The software for clients should also be working on a browser based system for remote users. This will allow any authorized user to display the video of any desired camera on the monitor with full PTZ and associated controls.
- Retrieval: The VMS application should allow retrieval of data instantaneously or any date / time interval chosen through search functionality of the application software. In case data is older than 30 days and available, the retrieval should be possible. The system should also allow for backup of specific data on any drives like DVD's or any other device in a format which can be replayed through a standard PC based software. Log of any such activity should be maintained by the system.

10.10.4DIGITAL VIDEO RECORDER

The Personal Computer based network digital Video recorder is to be provided. The Personal computer shall include the PC (min intel core i5 processor, 4GB DDR3 RAM, 1 TB hard disk) with latest configuration available in the market along with:

- Coloured LED monitor of minimum 40", coloured Laser printer, and External USB DVD writer.
- Windows operating system latest version with license.

Sl. No.	Items	Specifications Requirement
1	Recording & Display Frame Rate	Real time 240 frames per second total, 30 frames per second per camera
2	Recording Resolution	(NTSC): 704(H) x 480(V) / (PAL): 704(H) x 586(V) It should be possible to select lower resolutions
3	Operating System	MPEG4 Hardware RTOS (Real time operating system)

4	Compression Method	MPEG-4
5	Video Motion Detection Capable	Standard and built-in (selectable in menu)
6	Video Motion Detection Options	Masking, sensitivity adjustment
7	Monitoring Options	Split screen 1,2, 4 or 8 cameras
8	Playback Options	Search, still image capture
9	Network Operation Capable	To be provided by using WAN or LAN router
10	Ethernet/Modem Built-in	Ethernet standard and built-in
11	HDD Storage Consumption	80 ~ 350 MB per hour / channel variable based on frame speed and
12	HDD Speed	7200 R.P.M + 8 MB buffer
13	Operation	Triplex operation (simultaneous recording, playback, network operation)
14	Number of Video Inputs	Eight (8) video inputs for eight (8) cameras
15	Audio Recording Capable	Eight (8) audio inputs for eight (8) microphones
16	Number of Video Outputs	Two (2) A/V outputs, one (1) VGA output
17	Pan / Tilt / Zoom Protocol Drivers Built-in	Yes

10.10.5CAMERA FOR VISUAL MONITORING SYSTEM (VMS)

The VMS camera shall be suitable for wall mounting, ceiling mounting and switchyard structure mounting. The VMS camera should be colour high resolution, super HAD (Hole-accumulation Diode), Weatherproof, Dome type. The Camera shall have an internal amplifier that applies gain to the signal. The amplifier must operate when there is insufficient light in the scene to produce an acceptable video output level, and must only apply as much gain as is necessary. The camera shall

incorporate one level of automatic gain Compensation (AGC), allowing the user to achieve the optimal balance of noise and low light performance in demanding environments.

Sl. No.	Items	Specifications Requirement
1	Resolution(TV lines)	480 horizontal TV lines (Minimum)
2	Effective Pixels (minimum)	(PAL): 752(H) x 582(V) pixels (NTSC):768 (H) x 494 (V)
3	Low Light Sensitivity (lux)	0.1 lux
4	Signal to noise Ratio	More than 45 dB (AGC off)
5	White Balance Control (WBC)	Adjustable / Automatic (2,100° ~ 8,000°K)
6	Gamma Correction	d = 0.45

10.10.5.1SPECIFICATION FOR FIXED DOME CAMERA

The High Resolution DSP Colour Dome Camera (Digital Signal Processing using a DSP chip) shall include, as a minimum, the following features/ functions/ specifications:

a. The High Resolution DSP Colour Dome Camera shall incorporate a 1/3-inch Charge-coupled device (CCD).
b. The Dome Camera shall support the use of Auto Iris/ Direct Drive lens connected to the camera via 4-pin molex socket located from the inside of the camera housing. The camera must provide power to the lens.
c. The Camera shall support the use of fixed lens, focal length is 3.6mm, each.
d. The power consumption of the High Resolution DSP Colour Mini Dome Camera shall be no more than 1 watt.

10.10.5.2SPECIFICATION FOR PTZ CAMERA

The features of PTZ shall include:

e. Fully functional dynamic keyboard controllers with joystick for smooth camera movements
f. Controls all pan / tilt and zoom functions
g. Many preset options for quick access to frequently monitored areas and advanced tour programming
h. PTZ Camera 8 MP 32 XIR Network Speed Dome identification range of min 200 mtr, min qty. 10 nos.
i. Bullet camera and Dome camera as per site condition
j. Surveillance system must be accessed remotely
k. Storage data is mandatory for 90 days

Sl. No.	Items	Specifications Requirement
1	Electronic Shutter	1/60 ~ 1/100,000 sec. automatic
2	Back Light Compensation	Adjustable / Automatic and built-in
3	Automatic Gain Control (AGC)	Automatic ([0 ~ 30 dB] / 41) dB and built-in
4	Lens	270x (27x optical /10x digital) IR-corrected aspherical power zoom lens
5	Lens Aperture	F1.6 ~ 3.7
6	Pan / Tilt / Zoom Protocol Languages Supported	Yes
7	Panning Range	Complete 360 degrees (horizontal)
8	Pan Speed	Adjustable
9	Tilting Range	180 degrees (vertical)
10	Tilt Speed	Adjustable

10.11 Dekstop

a) Branded Dekstop HP 280G9 Tower PC; Intel Core i5-12500 Processor, 8 GB DDR4 RAM, 1 TB SSD, ATX Cabinet SMPS, Win11pro, Key Borad and Mouse, 5 Year Warranty, 22" Monitor
b) M/s Office Home and Business 2021
c) Reputed make Antivirus for server and desktop (Quick Heal / Norton etc.)
d) M/s Office for Desktop and Server 2021

10.12 PYRANOMETER:

Pyranometer sensing elements shall be made of winding plated thermopile with multi contacts conforming to the WMO standards. The Pyranometer shall be comprised of double transmission glass and horizontal bubble, suitable for harsh environment. Pyranometer to be installed in the ground with mounted structure of minimum three meter. Separate earthing to be made for sensor instrument.

Technical Requirements of Pyranometer:

Sl.No.	Details	Values
1	Spectral selectivity (% of deviation of the product of spectral absorptance and spectral transmittance from the corresponding mean within 0.35 µm and 1.5 µm)	< 3%
2	Sensitivity	Min 7 micro-volt/w/m^2
3	Time response (95%)	< 12 sec
4	Non linearity (% deviation from the responsivity at 500 W/m^2 due to any change of irradiance within the range of 100 to 1000 W/m^2)	< 1%
5	Ingress Protection	>=IP 65
6	Temperature Response (% deviation due to change in ambient temp. within an interval of 50 K)	<3% (70K interval)
7	Operating Temperature Range	0 deg to +80 deg.
8	Measuring angle	2π solid angle
9	Communication	RS 485 MODBUS-RTU
10	Tilt response (% deviation from the responsivity at 0° tilt , horizontal, due to change in tilt from 0° to 90° at 1000 W/m^2 irradiance)	< 1%
11	Directional response for beam radiation (The range of errors caused by assuming that the normal incidence responsivity is valid for all directions when measuring, from any direction, a beam radiation whose normal incidence irradiance is 1000 W/m^2) commonly defined as up to 80° zenith angle.	<20 W/m^2
12	Zero off-set **a)** Response to 200 W/m^2 net thermal radiation(ventilated) **b)** Response to 5K/hr change in ambient temperature	<15 W/m^2 < 4 W/m^2
13	Non Stability (change per year, % of full scale)	< 1%

10.13 AMBIENT AIR TEMPERATURE SENSOR:

Sl.No.	Details	Values
1	Principle	RTD (Platinum) Resistance proportional to temperature
2	Operating Temperature Range	-40 deg to 120 deg.
3	Time response (99%)	<10 sec
4	Accuracy	±0.2 deg.
5	Ingress Protection	IP 65
6	Probe Material	ABS
7	Radiation Shield	11 plates
8	Communication	RS 485 MODBUS-RTU

NOTE:

Any item/equipment not mentioned in the Technical Specification, but required for successful completion of the project shall be deemed to be a part of the scope of the work and the same shall be included by the bidder in their Bill of Quantity (BOQ).

PRO-FORMA

Contents

Form – I

CHECK LIST

Sl. No.	Scanned Copy of Documents to be uploaded	Name of folder	To be submitted in cover	Submitted (Y/N)
1	Check List (Form – I)	Forms	Statutory cover (Technical proposal)	
2	Application for Tender (Proforma – 1)	Annexure	Statutory cover (Technical proposal)	
3	Power of Attorney i.r.o. the person authorised to sign	Company Details	Non-Statutory cover (Technical proposal)	
4	Bidder's general information (Form – II)	Company Details	Statutory cover (Technical proposal)	
5	Earnest Money Deposit (Scanned copy)/Bank Guarantee for EMD (Proforma-6)	Drafts	Statutory cover (Technical proposal)	
6	Confirmation for No Deviation Sheet (Proforma – 2)	Annexure	Statutory cover (Technical proposal)	
7	Tender Document with Stamp & Signature by authorised person.	NIT	Statutory cover (Technical proposal)	
8	Addenda / corrigenda & Pre-Bid response/minutes , if published	NIT	Statutory cover (Technical proposal)	
9	Format of Letter of Bid (Form – III)	Forms	Statutory cover (Technical proposal)	
10	Pro-forma for undertaking to be submitted by the Bidders (Form – IV)	Forms	Statutory cover (Technical proposal)	
11	Statement of orders executed (Form – VI)	Forms	Statutory cover (Technical proposal)	
12	**Technical Credential :** i) Order(s)/Contract Agreement(s) issued by the purchaser ii) Commissioning Report (s) and Completion Certificate(s) iii) Satisfactory operation of Solar PV Plant (Proforma-8) iv) Month wise power generation data from last one year from the bid submission start date, signed by the Purchaser/ Ordering authority on Plant Owner's Letter Head v) Grid Synchronization/Connectivity Certificate/JMR data from License of the grid Substantiate timely completion of the work and Satisfactory operation of Solar PV Plant in support of minimum eligibility criteria as per Clause no. 7.2 of ITB	Credential	Non-Statutory cover (Technical proposal)	

Sl. No.	Scanned Copy of Documents to be uploaded	Name of folder	To be submitted in cover	Submitted (Y/N)
13	Bill of Material (Vide Proforma – 6)	Declaration	Non-Statutory cover (Technical proposal)	
14	List of Orders in hand with financial information	Declaration	Non-Statutory cover (Technical proposal)	
15	List of key personnel available and proposed to be engaged for the project mentioning their experience and qualification	Declaration	Non-Statutory cover (Technical proposal)	
16	Proof of Company Incorporation / Trade Licence	Company Details	Non-Statutory cover (Technical proposal)	
17	Electrical Contractor License	Certificates	Non-Statutory cover (Technical proposal)	
18	Labour License	Certificates	Non-Statutory cover (Technical proposal)	
19	PF registration certificate	Certificates	Non-Statutory cover (Technical proposal)	
20	ESI Certificate	Certificates	Non-Statutory cover (Technical proposal)	
21	PAN Card details	Certificates	Non-Statutory cover (Technical proposal)	
22	GST registration certificate	Certificates	Non-Statutory cover (Technical proposal)	
23	Professional Tax Registration certificate	Certificates	Non-Statutory cover (Technical proposal)	
24	Income Tax return for the last 03 (three) Assessment Years	Financial Information	Non-Statutory cover (Technical proposal)	
25	Summary statement of average annual turnover (Form – V)	Forms	Statutory cover (Technical proposal)	
26	Evidence of Access to or Availability of Credit/Facilities (Proforma – 4)	Financial Information	Non-Statutory cover (Technical proposal)	
27	Audited Report on Annual Accounts for last three Years.	Financial Information	Non-Statutory cover (Technical proposal)	
28	Order(s)/Contract Agreement(s) issued by the purchaser in support of financial eligibility criteria as per clause No.7.3 of ITB	Financial Information	Non-Statutory cover (Technical proposal)	
29	Project Proposal with Time Schedule	Declaration	Non-Statutory cover (Technical proposal)	
30	Any other documents, if found necessary	Declaration	Non-Statutory cover (Technical proposal)	

Form-II

BIDDER'S GENERAL INFORMATION

(To be submitted on the Letter Head of the Bidding Company)

Sr. No.	Description	Remarks
1	Name of the Bidder *(Incase of JV/ Consortium, name of all the members to be indicated and lead member to be identified)*	
2	Status of the Firm	
3	Mailing Address of Registered Office	
4	Mailing Address of Operation Office	
5	E-mail	
6	Web site	
7	Authorized Contact Person(s) with Name, Designation, Address and Mobile Phone No., E-mail address / Fax No. to whom all references shall be made	
8	Year of Incorporation	
9	Number of Years in Operation	
10	ISO Certification Yes/No	
11	Name of the Banker	
12	Branch Details of Bank	
13	Type of Account with Account Number	
14	IFSC Code	
15	Permanent Account Number (PAN) of the Bidder	*(Copy of PAN Card to be enclosed)*
16	GST ID	*(Copy of GST Regd. Card to be enclosed)*
17	PF Registration Number with Details	*(Copy of PF Registration to be enclosed)*
20	ESI Registration Number with Details	*(Copy of ESI Registration to be enclosed)*
21	Have the Bidder/ Company ever been debarred by any Govt. Dept./ Undertaking for undertaking any work	Yes/No *(If answer is YES, please providing details)*
22	Reference of any document information attached by the Bidder other than specified in the tender.	
23	Whether the Bidder wishes to form a Project Company for execution of work	Yes/No
24	Bidding company is listed in India	Yes/No
25	Whether company is MSME as on the bidding date	Yes/No

(Signature of Authorized Signatory)
With Stamp

Form – III

FORMAT OF LETTER OF BID

LETTER HEAD OF BIDDER (AS ENROLLED ONLINE ON e-Tendering PORTAL OF NIC)

To,

The Chief Engineer,

.....-.....

.....-.....

.....-.....

.....-.....

Sub: Letter of Bid for the work_____

_____

_____

_____

Ref: 1. NIeT No_____dated_____

2. Tender Id No. _____

Dear Sir,

We offer to execute the whole work in Turnkey Basis in accordance with the conditions of the NIT document as available in the website. The details of the EMD being submitted by us has been furnished on-line.

This Bid and your subsequent Letter of Acceptance / Work Order shall constitute a binding contract between us.

We hereby confirm our acceptance of all terms and conditions of the NIT document unconditionally.

Dated---------- **SIGNATURE OF THE TENDERER WITH SEAL**

Form – IV

PROFORMA FOR UNDERTAKING TO BE SUBMITTED BY THE BIDDER

(To be executed on non-Judicial stamp paper of requisite value)

(For genuineness of the information furnished on-line and authenticity of the documents produced before Tender Committee for verification in support of his eligibility)

I _____, Partner/Legal Attorney/ Accredited Representative of M/s_____, solemnly declare that:

1. We are submitting Tender for the Work _____ _____against Tender NIeT. No. _____
2. None of the Partners of our firm is relative of employee of West Bengal State Electricity Distribution Company Limited (WBSEDCL).
3. All information furnished by us in respect of fulfilment of eligibility criteria and qualification information of this Tender is complete, correct and true.
4. All documents/ credentials submitted along with this Tender are genuine, authentic, true and valid.
5. If any information and document submitted is found to be false/ incorrect any time, department may cancel my Tender and action as deemed fit may be taken against us, including termination of the contract, forfeiture of all dues including Earnest Money and banning / delisting of our firm and all partners of the firm etc.
6. Should this Bid be accepted, I/We* also agree to abide by and fulfil all the terms and conditions of provisions of the above mentioned Bidding Documents.

Signature along with Seal of Company.....

(Duly authorized to sign the Tender on behalf of the Contractors)

Name.....

Designation.....

Name of Company.....

(IN BLOCK LETTERS)

WITNESS

Signature.....

Date.....

Name & Address.....

.....

.....

.....

.....

Telephone No.....

Fax No.....

E-mail.....

***Strike out whichever is not applicable**

Form – V

CERTIFICATE REGARDING SUMMARY STATEMENT OF YEARLY TURNOVER

FORMAT OF CHARTERED ACCOUNTANT CERTIFICATE FOR FINANCIAL CAPABILITY OF THE BIDDER

(To be submitted on the Letter Head of the Chartered Accountant)

Ref.No._____Date:_____

To,
The Chief Engineer,
Solar Power Generation Department (SPGD)
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700163

Sub: Bid for "Tender for Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, new SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal

Dear Sir / Madam,

We have verified the Annual Accounts and other relevant records of M/s…… (Name of the bidder) and certify the following.

Further, we certify that the Financially Evaluated Entity (ies) had an Annual Turnover

A. ANNUAL TURNOVER OF LAST 3 YEARS:

FY	**Amount (Currency)**
Year 1:	
Year 2:	
Year 3:	

And

Net worth (strike out whichever is not applicable) of INR Crore computed as per instructions provided in this tender based on unconsolidated audited annual accounts as per last FY.

B. FINANCIAL DATA FOR LAST AUDITED FINANCIAL YEAR:

Description	**Year**
	Amount (Currency)
1. Current Assets	
2. Current Liabilities	
3. Working Capital (Current Assets- Current liabilities)	
4. Net Worth (As mentioned under Annexure to BDS)	

Yours faithfully

(Signature and stamp (on each page) of Authorized Signatory of Bidding Company.

Name: ……..

Date: ……

Place: ……..

Signature and stamp (on each page) of Chartered Accountant/Statutory Auditors of Bidding Company.

Name: ……..

Date: ……..

Place: ……

Notes:

Audited consolidated annual accounts of the Bidder may also be used for the purpose of financial criteria provided the Bidder has at least 50% equity in each company whose accounts are merged in the audited consolidated accounts and provided further that the financial capability of such companies (of which accounts are being merged in the consolidated accounts) shall not be considered again for the purpose of evaluation of the Bid.

Form – VI

STATEMENT OF SIMILAR TYPE OF ORDERS EXECUTED DURING LAST FIVE YEARS

Sl. No.	Name of the Installed Plants/ Project	Financial year	Order No. and date	Name of Owner/ order issuing authority	Plant Capacity (MW)	Ordered value (Rs.)	Completion Time	Completion Certificate	Performance Report	Grid Synchronization Certificate & Generation Data

Remarks, if any :

……

SIGNATURE OF THE TENDERER WITH OFFICE SEAL

Proforma: 1

`APPLICATION FOR TENDER

(To be submitted on official letter head by the bidder)

Ref. No..... Dated: .....

To
The Chief Engineer,
Solar Power Generation Department (SPGD)
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700163

NIT No: - SPGD/WBSEDCL/

Dear Sir,

Having examined the Statutory, Non-statutory of NIT and Tender documents, I/we hereby like to state that I/we wilfully accept all your conditions and offer to take up the work as per NIeT. No. stated above. I/We also agree to guarantee to replace or repair any defect, whenever it is detected, in the equipment/materials to the satisfaction of the owner in conformity with the conditions of contract, specifications, drawings, bill of quantities and addenda.

Dated this _____day of _____201____

Full name of applicant: _____

Signature: _____

In the capacity of: _____

Duly authorized to sign bids

For & on behalf of (Name of Firm): _____

(In block capitals or typed)

Office address:

Telephone no(s) (office):_____

Mobile No: _____

Fax No: _____

E mail ID: _____

.....

SIGNATURE OF THE TENDERER WITH OFFICE SEAL

Proforma-2

SPECIMEN COPY

NO DEVIATION CONFIRMATION

(To be submitted on the Letter Head of the Bidding Company)

Ref.No._____ Date: _

From: (*Insert name and address of Bidding Company*)

_____

_____

Tel.#:

Fax#:

E-mail address#

To,

The Chief Engineer,

Solar Power Generation Department (SPGD)

3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,

Kolkata –700 163

Sub: Bid for the "Tender for Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, new SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal ".

Dear Sir / Madam,

We understand that any 'deviation/ exception' in any form may result in rejection of bid. We, therefore, certify that we have not taken any 'exception/ deviation' anywhere in the bid and we agree that if any 'deviation/ exception' is mentioned or noticed, our bid may be rejected.

Place: [Signature of Authorized Signatory of Bidder]

Date: Name:

Designation:

Seal:

Proforma: 3

BANK GUARANTEE FOR EARNEST MONEY DEPOSIT/BID SECURITY

(The non-Judicial stamp paper of Rs 100/- should be in the name of issuing bank)

Ref..... **Bank Guarantee No……..**

Date……..

To

The ……..

……..

……..

West Bengal

Dear Sirs,

In accordance with Invitation to bid under your Bid No..... M/s....., having its Registered/Head Office at..... (Hereinafter called the `Bidder') wish to participate in the said Bid of.....and you, as a special favour have agreed to accept an irrevocable and unconditional Bank Guarantee for an amount of..... (..... in words……..) Valid upto.....on behalf of Bidder in lieu of the Bid deposit required to be made by the bidder, as a Condition precedent for participation in the said Bid.

We, the.....Bank (Name) at.....(Address) having our Head Office at..... Guarantee and undertake to pay immediately on demand by West Bengal State Electricity Distribution Company Ltd., the Amount of.....(..... In words.....)Without any reservation, protest, demur and recourse. Any such demand made by said `Owner' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder.

This Guarantee shall be irrevocable and shall remain valid upto 06(six) calendar months with a claim period of 3(three) months from the date of opening of Technical Bid.

If any further extension of this guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instruction from M/s.....on whose behalf this guarantee is issued.

In witness where of the Bank, through its authorized office, has set its hand and stamp on this.....day of.....20.....at.....

WITNESS

.....	.....
(Signature)	(Signature)
.....	.....
(Name)	(Name)
.....	.....
(Official Address)	(Official Address)

Proforma: 4

EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/ FACILITIES

(To be given by banker of bidder)

BANK CERTIFICATE

This is to certify that M/s …….. (FULL NAME AND ADDRESS) who are submitting their Bid to ……..against their tender specification vide Ref. No…….. and date…….. is our customer for the past …….. years.

Their financial transactions with our bank have been satisfactory. They enjoy the following fund based and non fund based limits including guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl. No.	TYPE OF FACILITY	SANCTIONED LIMIT AS ON DATE	UTILIZATION AS ON DATE……..

This letter is issued at the request of M/s……..

Sd/-

Name of Bank ……..

Name of authorized Signatory ……..

Designation ……..

Phone No ……..

Address ……..

SEAL OF THE BANK

Proforma: 5

SATISFACTORY OPERATION OF SOLAR PV PLANT

(On Plant Owner's Letter Head)

Date: __/__/_____

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the (plant detail and location) was commissioned on (Date of commissioning) by (Bidder Details) against the LOI/ WO No. (Details of LOI/ WO with complete scope).

The project is under operation since the date of commissioning and has been working satisfactorily as per the estimated output. The cumulative generation (Net) of the plant recorded for the previous year is (Number of units generated) and the Performance Ratio is_____.

Regards,

Signature & SEAL of Authorized Person

Proforma: 6

BILL OF MATERIALS (BOM)

(To be completed & submitted with the Bid)

Name of the Work: Procurement, Supply, Installation, Testing and Commissioning including warranty obligation of two nos. 01 MW Solar Inverter, new SCADA system, ESE type LA etc. at TCF Canal Bank 10MW(AC) ground mounted Solar PV Power Plant in Block Chopra, Dist. Uttar Dinajpur, West Bengal.

Sl No	Material Description	Qty	UOM	Description / Specification proposed
1	Supply of Solar Inverter 1000KW at 50C for replacement of existing FIMER make or **equivalent** 1000KW Inverter, 400 V AC, 1000 V DC (with 5 years warranty) as per technical specification	2	No	
2	Supply of ESE LA complete as per technical speciofication	60	set	
3	Supply of 1CX240 sq mm DC Al cables (Red and Black)(Actual required Qty will be **finalised** as per site inspection during execution of the work) as per technical specification	3	KM	
4	Supply of 6 sq mm DC Solar cables Cu (Black and Red)(Actual required Qty will be finalised as per site inspection during execution of the work) as per technical specification	16.5	KM	
5	Supply of Solar PV Module to replace the defective existing one with Mono-crystelline (PERC) /N Type modules to catter the existing capacity (550Wp or above) as per technical specification	123500	Wp	
6	Supply of inverter duct of 1.0MW Solar Inverter of eexistione (approved quality)	10	set	
7	Supply of SCADA Panels (MCR)	1	set	
8	Supply of SCADA Panels (LCR)	5	Set	
9	Supply of SCADA Software	1	set	
10	Supply of SCADA Server,Big Screen Smart TV of reputed make 55" display,Communication cable, PC/Printer including Router, other accessories to complete the SCADA (Including supply of route marker to to enable marking at every 3Meter) to enable communication **upto Inverter** (at LCR Room) level only.	1	Set	
11	Supply of UPS 10KVA and Battery set for SCADA System at MCR as per technical specification	1	set	
12	Supply of UPS 2KVA and battery set for SCADA System at LCR as per technical specification	5	SET	
13	Supply of necessary AC/DC Distribution Box	1	SET	
14	Supply of SCADA compatible SMP3 Pyranometer and Ambient Temperature Sensor as per technical specification	1	set	

15	Supply of OTI/WTI SCADA compatible as per technical specification	5	set	
16	Supply of Fire alarm system at MCR and 5 nos of LCR as per technical specification	6	set	
17	Supply and free installation of reputed desktop PC with licensed OS Window 11, software, antivirus for 5 yrs and Laser Jet Printer as per technical specification	2	Set	
18	Supply of reputed make Chair & Table (1 + 4)	1	Set	
19	Supply of 1.5Ton Inverter spilt Air Conditioning system, 5 Star, of reputed make as per technical specification	1	Set	

N.B.: Any other item required for commissioning of the plant shall be incorporated.

Proforma: 07

BANK GUARANTEE FOR CONTRACT PERFORMANCE

(To be executed in non-judicial stamp paper of Rs. 100/-)

Ref.....

Bank Guarantee No..... Date...

To
The Chief Engineer,
Solar Power Generation Department (SPGD)
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700163

West Bengal

Dear Sirs,

In consideration of West Bengal State Electricity Distribution Company Ltd., (herein after referred to as the "Owner" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s.....with registered/Head office at.....(Hereinafter referred to as "Contractor" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns), a Contract issued by Owner's Letter of Award No.....dated .....for.....(scope of work) and the same having been acknowledged by the Contractor, resulting in a Contract bearing No.....dated ..... Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract including net minimum guaranteed generation equivalent to Rs..... (.....in words.....) being (10%) (Ten percent) of the total contract value (aggregating first, second and third contract values) to the Owner.

We.....
..... (Name & Address) having its Head Office at.....(hereinafter referred to as the "Bank", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, on demand any or all monies payable by the Contractor to the extent of Rs.....(.....in words.....) as aforesaid at any time up to.....* (day/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to this Contractor.

Any such demand made by the Owner on the bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under the guarantee from time to time to extend the time for performance or the Contract by the Contractor. The Owner shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce or to for bear to enforce any covenants, contained or implied in the Contract between the Owner and the Contractor or any other course or remedy or security available to the Owner. The Bank shall not be relieved of its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of omission or commission on the part of the Owner or any other indulgences shown by the Owner or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The bank also agrees that the Owner at its option shall be entitled to enforce this guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and not withstanding any security or other guarantee the Owner may have in relation to the Contractor's liabilities.

Notwithstanding anything contained herein above our liability under this guarantee is restricted to Rs.....
(.....in words.....) and it shall remain in force upto and including .....**(day/month/year) and shall be extended from time to time for such period as may be desired M/s.....on whose behalf this guarantee has been given.

Unless a demand or claim is lodged on us within and including.....*(day/month/year) we shall be discharged from all liabilities thereafter.

Dated this.....day of.....20.....at.....

WITNESS

....

(Signature) (Signature)

....

(Name) (Name)

(Official Address) (Official Address)

Attorney as per Power

Of Attorney No.....

Date.....

* **Till 3 (three) months after the validity of the Bank Guarantee.**

** **Upto 3 (three) months after the expiry of warranty/guarantee period.**

Notes:

1. The stamp paper of appropriate value shall be purchased in the name of issuing bank.
2. The sum shall be 10% (ten percent) of the total contract value (aggregating first, second and third contract values).

   The performance Bank Guarantee/ Contract Performance Bank Guarantee shall be valid as per terms of contract. A period of three (3) months should be added as claimed period from the last date of validity of the Bank Guarantee.

Proforma: 08

CONTRACT AGREEMENT

(To be executed on Non-Judicial Stamp Paper of Rs. 100/-)

Articles of agreement made on this..... day of ..... in the year ..... between West Bengal State Electricity Distribution Company Limited (A Government of West Bengal Enterprise) having its head office at Vidyut Bhavan, Block–DJ, Sector–II, Kolkata–700091 hereinafter referred as 'WBSEDCL' (which expression shall unless excluded by or repugnant to the context be deemed to include its successors and assigns) of the ONE PART,

AND

.....Hereinafter referred to as the 'CONTRACTOR' (Which expression shall unless excluded by or repugnant to the context be deemed to include his heirs, executors, administrators, representatives and assigns) of the OTHER PART.

WHEREAS the WBSEDCL invited tenders vide Tender Notice No .....dated..... (Annexed hereto) for Design & engineering, manufacturing &procurement, supply, installation, testing and commissioning including warrantee obligation with 5 (five) year's comprehensive operation and maintenanceof..... ..... (Project name)

AND WHEREAS in pursuance of such invitation for tenders, the contractor submitted a tender vide no .....dated..... (Annexed hereto).The Techno-commercial part of which was opened on……..And the Price bid was opened on.....(The tender offer is in custody of the Company at present).

AND WHEREAS AFTER consideration of the tender submitted by the contractor with clarification(s), if any, the WBSEDCL accepted the said tender submitted by the contractor and placed Letter of Award no ..... dated..... (Annexedhereto).

NOW, THEREFORE, the WBSEDCL and the contractor agree as follows:

1. The Contractor agrees to undertake the work of ".....” as per Letter of Award no .....dated.....referred to above.

2. The WBSEDCL agrees to pay the Contractor as per order no ..... dated.....referred to above.

3. Both the Contractor and the Company agree that for the purpose of jurisdiction of court in regard to any dispute arising out of this agreement, this agreement shall be deemed to have been executed within the jurisdiction of the original side of the High Court, Kolkata.

IN WITNESS WHEREOF the parties have hereunder affixed their signature on the day, month and year written as above.

SIGNED, SEALED AND DELIVERED

.....	.....
Contractor	WBSEDCL
1).	1).....
Witness	Witness
2).	2).....
Witness	Witness

Proforma: 09

INDEMNITY BOND

(To be executed on Non-Judicial Stamp Paper of Rs. 100/-)

BY THE PRESENT INDEMNITY BOND EXECUTED by us on this ……..Day of ……..20……., We having Registered Office at …….. (herein after called "OBLIGOR/OBLIGORS" which expression shall mean and includes my/our successors legal representatives, assigns) do hereby binds ourselves and also our entity ..... after having the power to bind so with the promise and undertaking in favour of the West Bengal State Electricity Distribution Company Limited, a company incorporated under Companies Act 1956 having Registered Office at Vidyut Bhavan, Block-DJ, Sector-II, Salt Lake City, Kolkata-700091 (hereinafter called as OBLIGEE, which expression shall mean and include it's legal representative, administrators assigns.

WHEREAS OBLIGOR/OBLIGORS has/have been awarded the project under letter no…….. dated …….. issued by the OBLIGEE after having observing necessary formalities, the details of which is described in the schedule given here under as per letter mentioned herein-above.

AND WHEREAS according to the condition of the contract the OBLIGOR/OBLIGORS are under obligation to execute this Indemnity Bond before the commencement of actual execution and OBLIGOR/OBLIGORS is/are aware that unless this Indemnity Bond is executed in accordance with the condition of contract before the actual execution in accordance with law the OBLIGEE shall have the power to deem that actual work has been stated within the meaning of the contract before the execution of this Indemnity Bond.

Now this indenture witnesses that We the OBLIGOR/OBLIGORS do hereby undertake:

1. THAT the OBLIGEE shall not be held responsible for any type of accident which may take place during the course of work undertaken by the OBLIGOR/OBLIGORS.
2. THAT the OBLIGOR/OBLIGORS will take/adopt all safety norms in respect of each and every workmen labour personnel according to the rules and laws relating to welfare of workers to the satisfaction of the OBLIGEE IN ALL CASES.
3. That the OBLIGOR/OBLIGORS undertakes/undertake to engage only those labour worker or any other personnel whether skilled or unskilled or any other person whether in technical management or non-managerial or any other capacity in the area covered under Employee' State Insurance Act, 1948 who has/have insurance coverage within the meaning of Employees' State Insurance Act and further undertakes NOT to engage any person in the area covered under Employees State Insurance Act., who does/do not has/have insurance coverage within the meaning of Employees' State Insurance Act,1948.
4. THAT the OBLIGOR/OBLIGORS undertakes/undertake to indemnify and keep harmless the OBLIGEE from all claims, action, proceedings and of risk, damage,

danger to any person whether belonging to/or not belonging to OBLIGOR/OBLIGORS.

5. THAT the OBLIGOR/OBLIGORS shall keep harmless the OBLIGEE from all claims, compensation, damages, any proceedings in respect of any of its employee/workmen under the Employee Compensation Act or any other laws for the time being in force.
6. THAT in case of Joint Venture OBLIGOR/ OBLIGORS shall undertake to Indemnify OBLIGEE from all losses or damages that OBLIGEE may sustain due to dispute/disputes that may arise between the Constituents of the JV.
7. THAT the OBLIGOR/OBLIGORS is/are aware and accept that for the persistent or repeated violation of any condition mentioned in this Indemnity Bond, the OBLIGEE shall have right to terminate the contract of work issued by the OBLIGEE to OBLIGOR/OBLIGORS as per relevant provisions of the Tender Document.

SIGNED AND DELIVERED

BY THE OBLIGOR/OBLIGORS .....

Signature .....

WITNESS:

1) Name & Designation .....

Signature .....

2) Name & Designation .....

Signature .....

Proforma: 10
EXTENSION OF BANK GUARANTEE

Ref..... Date.....

To
The Chief Engineer,
Solar Power Generation Department (SPGD)
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700163

West Bengal

Sub: Extension of Bank Guarantee No.....for Rs..... favoring yourselves, expiring on.....on account of M/s.....in respect of Contract No.....dated .....(Hereinafter called original Bank Guarantee).

Dear Sirs,

At the request of M/s....., we.....Bank, branch office at.....and having its Head Office at.....do hereby extend our liability under the above mentioned Bank Guarantee No..... dated..... for a further period of.....(Years/Months) from.....to expire on..... Expect as provided above, all other terms and conditions of the original bank guarantee No.....dated .....shall remain unaltered and binding.

Please treat this as an integral part of the original bank guarantee to which it would be attached.

Yours Faithfully,

For.....

Manager/Agent/Accountant.....

Power of Attorney No.....

Dated.....

SEAL OF BANK

NOTE: The non-judicial stamp paper of appropriate value shall be purchased in the name of the bank who has issued the Bank Guarantee.

Proforma: 11

FORMAT FOR PRE-BID QUERIES

To
The Chief Engineer,
Solar Power Generation Department (SPGD)
3rd Floor, Data Centre Complex, Street No. 41, Action Area-I, New Town,
Kolkata – 700163

Sub: Pre-Bid queries

Ref. Tender No. : **----------**

Dear Sir,
Having examined the General and Special Conditions of Contract and the Terms of Reference including all attachments thereto, the receipt of which is hereby duly acknowledged, we have some queries and the same are submitted as per the format provided in the tender documents.

Sl. No.	**Clause No.**	**Existing provision**	**Clarification Required**	**Suggested text for the amendment**	**Rationale for the Clarification or amendment**

.....-.....-

Authorised Signatory

(Seal and Designation)

THE END