DREDGING CORPORATION OF INDIA LIMITED
DREDGE HOUSE, PORT AREA
VISAKHAPATNAM- 01

NOTICE INVITING e-TENDER (NIT)

NAME OF WORK: DESIGN, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING & COMMISSIONING OF 100 KWP GRID CONNECTED ROOF TOP SOLAR PHOTOVOLTAIC (PV) SYSTEM AT DREDGE HOUSE, PORT AREA, VISAKHAPATNAM- 01

(TENDER NO.DCI/HR/06/E/SOLAR/2019 DATED: 06/01/2020)

JGM (MAT), 3RD FLOOR, DREDGE HOUSE, PORT AREA,
VISAKHAPATNAM- 530001.

INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING

DREDGING CORPORATION OF INDIA LIMITED INVITES ONLINE E TENDERS IN TWO BID SYSTEM I.E. TECHNICAL BID AND PRICE BID FROM THE REPUTED FIRMS IN THE FIELD OF SITC OF GRID- INTERACTIVE SOLAR PV SYSTEM FOR THE FOLLOWING WORK:-

1	TENDER NO	DCI/HR/06/E/SOLAR/2019 DT:06/01/2020
2	NAME OF WORK & LOCATION	DESIGN, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING & COMMISSIONING OF 100 KWP GRID CONNECTED ROOF TOP SOLAR PHOTOVOLTAIC (PV) SYSTEM AT DREDGE HOUSE, PORT AREA, VISAKHAPATNAM- 01
3	COST OF TENDER DOCUMENTS	1,180/-
4	EARNEST MONEY DEPOSIT	50,000/-
5	SECURITY DEPOSIT	5,00,000/-
6	PERIOD OF COMPLETION	3 MONTHS
7	LAST DATE & TIME OF SUBMISSION OF BID,EMD	06.02.2020
8	DATE & TIME OF OPENING TECHNICAL BID	06.02.2020

Pre Bid Meeting will held in Tender Room at ground floor of DCI administrative building, Dredge House, Port Area, Visakhapatnam- 01, at 3:30 PM on 20/01/2020.

1. Tender shall be submitted online only at CPPP website: https://www.eprocure.gov.in. Downloaded tenders (offline) shall not be accepted. Tenderers are advised to follow the instructions provided in the 'Instructions to the tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e-procurement at https://eprocure.gov.in'. Aspiring Bidders/Suppliers who have not enrolled/registered in e-procurement should enroll/register before participating through the website https://www.eprocure.gov.in.The portal enrolment is free of cost.

2. Tenderers can access tender documents on the website, fill them with all relevant information and submit the completed tender document into electronic tender on the website https://www.eprocure.gov.in.

3. Tenders and supporting documents should be uploaded through e-procurement portal. Hard copy of the tender documents will not be accepted.

4. All documents as per tender requirement should be uploaded online and further no documents will be accepted offline. Bidder not submitting any of the required documents online will summarily be rejected.

5. The Bid is to be submitted concurrently duly digitally signed in the website https://www.eprocure.gov.in.

6. The details of the EMD & Tender Document cost should be filled ONLINE.

   a) **EMD**: The Tender must be submitted along with Earnest Money Deposit **(EMD)** for **50,000/-**(REFUNDABLE) by depositing the said amount into **Dredging Corporation of India Limited, Current Account No: 35833070000014, IFSC/RTGS CODE: SYNB0003583, SWIFT CODE: SYNBINBB032, BANK NAME: Syndicate Bank, BRANCH NAME: DCI LTD, Port Area Branch, Visakhapatnam- 530001.**

   b) **TENDER DOCUMENT COST**: The Tender must be submitted along with Tender document cost for **Rs. 1,180/-** (Rupees One Thousand One Hundred And Eighty only) (NON-REFUNDABLE) by depositing the said amount into **Dredging Corporation of India Limited, Current Account No: 35833070000014, IFSC/RTGS CODE: SYNB0003583, SWIFT CODE: SYNBINBB032, BANK NAME: Syndicate Bank, BRANCH NAME: DCI LTD, Port Area Branch, Visakhapatnam**- 530001.

   c) EMD is exempted for MSM to vendors. MSME certificate to be upload.

7. All the bidders should submit the information in objective manner and uploaded documents should be verified to know whether correct document is uploaded or not. Scanned copy of the documents should be submitted online by the bidder while uploading the documents under Cover 1:

LIST OF DOCUMENTS TO BE UP LOADED IN E-TENDER WITHIN THE LAST DATE OF SUBMISSION:

a) Details of payment made online in DCI account towards cost of tender documents / EMD like UTR NO., Dated, etc or /Bank Guarantee of any Scheduled Bank.

b) Documentary proof of work experiences.

c) Certificate of Financial Turnover from CA.

d) Bank Solvency Certificate

e) Duly signed annexure with regard to details of relatives working in DCI/ illegal gratification, etc.

f) Copy of Certificate of registration for GST.

g) The contractor has to submit PAN card, Bank details for e payment, Firm's registration certificate, GST Registration Certificate etc.

h) MSME Certificate, if applicable.

ELIGIBILITY CRITERIA

SL No	DESCRIPTION
1	Bidder should have satisfactory completed the similar works as mentioned below during the last Seven years ending on the last date of submission of tender. The firm should submit the copies of completion certificate issued by the offices of the client. The completion certificate must clearly indicate the following (originals shall be produced for verification). a) The date of completion of work. b) Nature and value of the work. c) That the work has been completed satisfactorily. d) Work order value.
2	Bidder should have had an average annual financial turnover of Rs. 15.00 Lakhs during the last three financial years ending 31st March 2019 (Scanned copy of Certificate from Chartered Accountant to be uploaded)
3	The experience of having successfully completed similar work during the last seven years ending last of month previous to the one in which applications are invited should be either of the following : a) Three similar completed works costing not less than Rs. 20.00 Lakhs. **OR** b) Two similar completed works costing not less than Rs. 25.00 Lakhs. **OR** c) One similar completed works costing not less than Rs. 40.00 Lakhs.
4	Bidders should have submitted the Tender Cost Fees And EMD well before the specified date.

Note: Similar work shall mean "Design, Supply, Construction, Installation, Testing & Commissioning Grid Connected Roof Top Solar Photovoltaic (PV) System".

1. The intending bidder must read the terms and conditions of the tender carefully before submitting.They should only submit their bid if they consider them-self eligible and are in possession of all the documents required.

2. Information and Instructions for bidders posted on website shall form of bid document.

3. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website www.eprocure.gov.in or www.dredge-india.com.

4. But the bid can only be submitted after deposition of EMD online in DCI account as per the details given below or Bank Guarantee of any Scheduled Bank towards EMD in favour of Dredging Corporation of India Limited, Visakhapatnam-01, as per the details enclosed in the annexure.

5. The intending bidder must have valid class-III digital signature to submit the bid.

6. On opening date, the contractor can login and see the bid opening process.

7. Contractor can upload documents in the form of JPG format and PDF format.

8. **Certificate of Financial Turn over:** At the time of submission of bid contractor may upload Affidavit/Certificate from CA mentioning Financial Turnover of last 3 years or for the period as specified in the bid document and further details if required may be asked from contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

9. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue.
   In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).
   However, if a tenderer quotes nil rates against each item in item rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

10. The Technical bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the prequalification bid shall be communicated to them at a later date.

11. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

12. If it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the bid submitted earlier shall become invalid.

13. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/registrations or proof of applying for obtaining labour licenses, etc.

    The letter of award shall be issued to the lowest contractor only on receipt of applicable labour licenses, etc or on submitting the proof of applying thereof. No Running Account Bill shall be paid for the work till the applicable labour licenses, etc are received from the contractor by the Engineer-in-Charge.

14. The following authorization from manufacturer shall be made available by the bidder along with submission of the performance guarantee:-

    i) Authorization for providing service support for PV panels and Power Units during the defect liability period of one year and after one year on chargeable basis.

    ii) They will provide the technical support / service for PV panels and Power Units.

    iii) Certificate from manufacturer that the models quoted are in regular production and will not become obsolete for at least next five years.

DREDGING CORPORATION OF INDIA LIMITED
E- TENDER NO. DCI/HR/06/E/SOLAR/2019, DT: 06/01/2020

Dredging Corporation of India Limited, Dredge House, Port Area, Visakhapatnam- 530001, invites online e-tenders in two bid system i.e. Technical Bid and Price Bid from the specialized firms in the field of SITC of Grid-Interactive Solar PV System for the following work:-

NAME OF WORK: DESIGN, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING & COMMISSIONING OF 100 KWP GRID CONNECTED ROOF TOP SOLAR PHOTOVOLTAIC (PV) SYSTEM IN RCC AT DREDGE HOUSE, PORT AREA, VISAKHAPATNAM- 01

Intending bidders are eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-

Criteria of eligibility for submission of bid documents Conditions.

As per INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING

To become eligible to participate in the bid, the bidders shall have to furnish an affidavit as under:-

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

1. The time allowed for carrying out the work will be 3 Months from the date of handing over of the site, indicated in the tender documents.

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

3. Dredging Corporation of India Limited does not bind itself to accept the lowest or any Other bid and reserves to itself the authority to reject any or all the tenders received without the assigning any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

4. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

5. This notice inviting Tender and complete tender documents shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of :-

6. The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

7. In case any discrepancy is noticed between the documents as uploaded at the time of submission of the bid online and hard copies as submitted physically, then the bid submitted shall become invalid and DCI shall, without prejudice to any other right or remedy, be at liberty to forfeit earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

SECTION I

GENERAL AND COMMERCIAL CONDITIONS FOR SOLAR PV

1.0 GENERAL

This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation of Interactive Grid Solar PV System consisting of all cabling, earthling and final testing etc.

Location: The proposed Grid Provision of grid connected roof top solar photovoltaic (PV) System shall be installed at DCI Ltd., Dredge House, Port Area, Visakhapatnam - 01.

The work shall be executed as per General Specifications for Electrical Works as per relevant I.E. Rules, BIS/IEC and as per directions of Engineer- in-charge. These specifications/ conditions are to be read in conjunction with above and in case of variations; specifications given in the in the contract shall apply. However, nothing extra shall be paid on account of these additional specifications and conditions, as the same are to be read along with schedule of quantities for the work. In case of discrepancy between the BOQ, List of Makes, Tech. Specifications, Drawings etc the following order of preference shall be observed :-

1. BOQ
2. List of Makes
3. Technical Specifications
4. Drawings
5. DCI specifications
6. IS/ IEC/International Codes

The tenderer should, visit the site and get familiarized with the site conditions before tendering, on their account.

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

2.0 TERMS OF PAYMENTS

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

S.NO.	STAGE	AMOUNT IN PERCENT
1	On supply of material at site along with test certificates, guarantee of manufacturer against defect, performance and availability of spare parts for required number of years as per tender document, insurance till handover to DCIL.	50% of quoted rates
2	On installation at site	15 % of quoted rates
3	On successful testing and commissioning	15 % of quoted rates
4	On successful synchronization with grid	20 % of quoted rates
5	On successful assured power generation for first year (defect liability period) till completion of 10th year from date of handover.	**a)** Security Deposit will be released after 1year or same will be released on submission of BG for equal amount.
		b) 0.5% quoted value BG to be submitted every year for a period of 10 years towards performance guarantee

3.0 Works to be carried out by DCI

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

Space for accommodating all the equipments and components involved in the work. However, watch and ward shall be responsibility of the contractor till completion & final handing over to DCIL.

4.0 Works to be done by the contractor

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

i) Tools and tackles required for handling and installation of equipments.

ii) Protection required for the equipments from rain, dust storm etc. during transportation i.e. polythene cover and tarpaulin till completion & handing over to department.

iii) Necessary equipments for commissioning/site testing.

iv) Supplying & Laying of suitable size copper conductor armoured for control and power cable from SPV modules, main power cable to PCU units etc. i/c S&F of PVC channel steel conduit etc.

v) Making arrangement of electricity and water required for installation.

vi) Providing cement & concrete foundation as per manufacturer standard and approved drawing by the department.

vii) Minor building work i/c repairing/ closing of all holes for cable entry etc. complete as reqd.

5.0 RATES

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

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

6.0 COMPLETENESS OF TENDER

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

7.0 STORAGE AND CUSTODY OF MATERIALS

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

8.0 CARE OF THE BUILDING

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

9.0 COMPLETION PERIOD

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

10.0 GUARANTEE

All equipments shall be guaranteed for a period of 12 months, from the date of taking over the installation by DCI, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in- Charge. In case it is felt by DCI that undue delay is being caused by the contractor in doing this, the same will be got done by other source at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

The tenderer shall guarantee among other things, the following:

(a) Quality, strength and performance of the materials used as per manufacturers standards.

(b) Safe mechanical and electrical stress on all parts under all specified conditions of operation.

(c) Satisfactory operation during the maintenance period.

11.0 POWER SUPPLY/ WATER SUPPLY

Power and water supply will be arranged by DCI at the site at free of cost for installation, testing purpose Contractor will take due care to ensure safety of electrical installation during execution of work.

12.0 ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS

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

13.0 DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER

After award of work the tenderer shall furnish detailed technical literature, pamphlets and performance data for appraisal.

The successful tenderer would be required to submit the following drawings for approval of the department.

a) General arrangement drawing of the equipments.

b) Single line diagram.

c) Schematic drawing including all safety interlocking.

d) Details of foundations for the equipments and the weights of assembled equipments.

e) Equipment details proposed to be procured for the execution of the work for the approval of the Engineer-in- charge.

f) Any other drawings necessary for the job.

i) Detailed technical specification of all the equipments.
ii) Design criteria.
iii) Design calculations.
iv) General arrangement and assembly drawings.
v) Contour plan for the area.
vi) Solar radiation data.
vii) Schematic diagram for entire electric system.
viii) G.A. drawings for all types of structures.
ix) Quality assurance plans.
x) Test report (for type, acceptance and routine tests).
xi) O & M instruction's manuals and its drawings.

g) Electrical contractor license or undertaking that they will either obtain valid electrical license at the time of execution of electrical work or associate contractor having valid electrical license of appropriate class.

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

15.0 EXTENT OF WORK

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

16.0 INSPECTION AND TESTING

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

17.0 COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

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

(i) Factories Act.
(ii) Indian Electricity Rules.
(iii) B.I.S. & other standards as applicable.
(iv) Workmen's compensation Act.
(v) Statutory norms prescribed by local bodies like CEA, Power Supply Co., CPCB as amended up to date. etc.

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

Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs 5000/- (Rs Five Thousand only) for each default. In addition, DCI will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

18.0 INDEMNITY

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

19.0 ERECTION TOOLS

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

20.0 COOPERATION WITH OTHER AGENCIES

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

21.0 The work will be carried out with least disturbance during shifting & shut down taken in consultation with DCIL.

22.0 MOBILIZATION ADVANCE

No mobilization advance shall be paid to the contractor.

23.0 INSURANCE AND STORAGE

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

24.0 VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION

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

25.0 PAINTING

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

26.0 TRAINING

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

27.0 INTERPRETING SPECIFICATIONS

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

(a) Schedule of quantities
(b) Technical specifications
(c) Drawing (If any)
(d) General Specifications
(e) Relevant BIS or other international code in case BIS code is not available

28.0 QUALITY ASSURANCE:

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

All the materials to be used in the work shall be new and of good quality and shall be got approved from the Engineer-in-Charge before use at site. The equipment shall be not older more than 6 months from the date of receipt at site or year of manufacturing should be current. The equipment shall be procured directly from the manufacturer or authorized dealer and delivery challan/invoice/ proof of dispatch of material of the Agency from where the material is purchased in support of genuineness of material shall be submitted along with bill for verification. Manufacturer test certificates of all the equipment and material shall be submitted along with supply.

29. ARBITRATION:

Should any dispute or difference arise between the Corporation and the contractor in connection with this contract, or as to the rights and liabilities of the parties here to, it will be referred to Arbitration by a sole Arbitration, a person to e Appointed by the Chairman-cum-Managing Director, Dredging Corporation of India Ltd., Visakhapatnam and the award of the Arbitrator shall be final and binding upon the parties here to, subject to the provisions of the Arbitration and Conciliation Act, 1996 (Act,26 of 1996). The Arbitrator will give a reasonable award. It will be in Accordance with the provisions of the Arbitration and Conciliation ACT, 1996 of any statutory modification or re-enactment thereof. The Arbitration may from time to time with the consent of the parties enlarge the time for making & publishing the award any interest in the award either for the Pre-reference period of pen dentine life. The venue of the Arbitration will be at Visakhapatnam, and the courts at Visakhapatnam will have exclusive jurisdiction on all matters with reference to this contract.

30.0 The tenderer will furnish a certificate that he is not related to any officer of Dredging Corporation of India Limited or any officer of the rank of asst. Secretary or above in the ministry of Shipping, Government of India. The tender should give a declaration along with their tender about the names Of the relatives, who are employed in Dredging Corporation of India Limited. Pro-forma of declaration attached. (Pro- forma -I).

31.0 The tenderer shall give an undertaking that they have not made any payment or illegal gratification to any person/authority connected with the bid process so as to influence the Bid process and have not committed any offence under Prevention of Corruption Act in connection with the Bid process (Pro-forma-II) The tenderer shall disclose any payments made or proposed to be made to any intermediaries (agents) in connection with the bid (Pro-forma-II)

32.0 In case the tenderer fails to execute and complete the works within the stipulated period, liquidated damages @ 1% per week or part thereof up to a maximum of 10% of the contract value for delay in the completion of work will be levied on the value of the balance work to be completed as per work order for non-completion of the work.

SECTION 2

PART-I: TECHNICAL SPECIFICATIONS FOR GRID INTERACTIVE SOLAR PV SYSTEM

1.0 GENERAL SCHEME & SCOPE

This document contains the requirement of Solar Photo Voltaic (SPV) power supply Grid Tied System for general light/ Air conditioning load. The light/ AC loads are to be used for illumination/ Air conditioning of the DCI AOB. Suitable size of solar photovoltaic system is to be installed at each location and has to feed the electric load of the AOB. The power conditioning unit (PCU) shall be Grid Tied, i.e. with a priority for use of Solar power for light/ AC load and if the solar power becomes inadequate due to sun outage or the fault in solar generation system then Main/grid supply shall be used for light/ AC load.

Terrace of building is available and the same shall be used for Installation of the solar modules/arrays. The PCU shall be installed inside the Building as per the availability of space in the building/terrace.

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

2.0 DEFINITION

A Grid Connected Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Inverter/Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT) and Controls & Protections interconnect cables and switches. PV Array is mounted on a suitable structure. Grid connected SPV power plant is without battery and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, inverters/PCUs etc. should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

3.0 GRID TIED SPV POWER SUPPLY SYSTEM:

Grid tied solar inverters are suited for outdoor use and the ideal solution for small commercial building rooftop and other application. The inverters provide a wide maximum point power tracking (MPPT) voltage range on EU efficiency of 97%.

4.0 SITE LAYOUT DESIGN:

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

5.0 SPV MODULE/ARRAY:

Solar Photo Voltaic Generating Sources: SPV generating sources constituted of following building blocks SPV Module: SPV Module is the basic building block of the SPV power supply, which consists of a number of Solar cells (a Semiconductor Devices which when exposed to sunlight produces DC electricity) connected in series and hermetically sealed with a toughened and highly transparent front glass cover. These modules are connected in series and parallel to get the desired power and voltage. The Rated DC current of One module shall be 330Wp or higher.

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

SPV Array: A number of panels are connected in parallel to get the desired power. This Whole combination is called an array. The SPV array is so designed that, it provides simultaneously meets the load demand, when sufficient Sunshine is available.

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

5.1 SOLAR PHOTOVOLTAIC MODULES:

5.1.1 The efficiency of the PV modules should be minimum 18%.

5.1.2 Test Certificate issued by one of the International Electrotechnical Commission authorized test centres.

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

5.1.4 The module type must be qualified as per IEC 61215 latest edition. Modules must qualify to IEC 61730 Part I and II for construction and safety qualification testing. Certificate for module qualification from IEC or equivalent to be submitted as part of the bid offer.

5.1.5 The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 330 Wp and above wattage. Module capacity less than minimum 330 Watts shall not be accepted.

5.1.6 Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.

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

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

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

5.1.9.1 The rated output power of any supplied module shall have tolerance of ±3%.

5.1.9.2 The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

5.1.9.3 The module shall be provided with a junction box with weather proof lid of sealed type and IP-65 rated.

5.1.10 **WARRANTIES:** The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and not less than 80% at the end of 25 years.

6.0 SPV MODULES

a. Each SPV Module to be supplied should have minimum declared output of 330Wp or higher. Number of Modules to be supplied shall be worked out accordingly. Test reports of the modules should be submitted.

b. Stabilized output of the Solar PV Array for the Power Plant should not be less than Calculated Kwp under standard Test Condition. Modules for Power Plant shall be made of poly or mono- crystalline Silicon Solar cells.

c. Peak power point voltage and the peak power point current of any supplied module and/or any module string (series connected module) shall not be more than 3% from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

d. Except otherwise specified, the front module surface shall consist of impact resistant, low iron and high transmission glass.

e. The module frame shall be made of aluminium or corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules.

6.1. SOLAR PV MODULE (ELECTRICAL FEATURES)

i) Crystalline high power cells shall be used in the Solar Photovoltaic module. Solar Module shall be laminated using laminating technology using established polymer (EVA) and Tedlar/Polyester laminate. The solar modules shall have suitable encapsulation and sealing arrangement to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with thermal expansion properties of the Silicon cells of the module framing arrangement/ material. The encapsulation arrangement shall ensure complete moisture proofing during life of solar modules.

ii) SPV Module conversion efficiency should be greater than 18% Module shall be made of high transmissivity glass front surface giving high encapsulation gain.

iii) All materials used shall be having a proven history of reliable and stable operation in external outdoor/indoor applications

iv) Module rating is considered under standard test conditions, however Solar

modules shall be deigned to operate and perform in relative humidity up to 100% with temperature between- 10Deg C and +85 Deg C and withstand guts up to 150Km/h from back side of the panel. The Geological data of Visakhapatnam can be referred for design to meet optimum generation.

v) Sample modules and production processes employed in the manufacture of the offered module shall be in accordance with the requirement of IEC 61730 with appropriate certificate.

vi) Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.

i. Name of the manufacturer of PV module

ii. Name of the manufacturer of Solar cells

iii. Month and year of the manufacturer (Separately for Solar cell and module)

iv. Country of origin (Separately for Solar cell and module)

v. I-V curve for the module

vi. Wattage, Im, Vm and FF for the module

vii. Unique Serial No and Model No of the module

viii. Date and year of obtaining IEC PV module qualification certificate

ix. Name of the test lab issuing IEC certificate

6.2 SOLAR PV MODULE (MECHANICAL FEATURES)

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

a. Toughened, low iron content.

b. High transmissivity front glass.

c. Anodized Aluminium Frame.

d. Ethyl vinyl Acetate (EVA) encapsulant.

e. Silicon edge sealant around laminate.

f. Tedlar/ Polyester trilaminate back surface.

g. Weather-proof DC rated MC connections easier and secure, not allowing for any loose connections, Resistant to water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.

7.0 JUNCTION BOXES (JBs):

a) The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JBs shall be such that input & output termination can be made through suitable cable glands.

b) Copper bus bars/terminal blocks should be housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208. Hinged door should be used with EPDM rubber gasket to prevent water entry.

c) Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs)
/ surge arrestors and suitable Reverse Blocking Diodes etc. The Junction Boxes shall have suitable arrangement for monitoring and disconnection for each of the groups.

8.0 PV ARRAY CONFIGURATION

i) The Solar array shall be configured in multiple No. of sub- arrays, providing optimum DC power. The bidder shall submit their own design indicating configuration of PCU and respective sub arrays.

ii) The PV modules should be mounted on aluminium structures/GI/ MS powder coated of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour.

iii) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels

iv) Regarding civil structures the bidder needs to take care of the load bearing capacity of the roof and to arrange suitable structures based on the quality of roof. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m^2. Suitable civil work for installation of the structure is to be done by the supplier. Civil Structure should be Neat & Clean, with proper alignment and round in shape with emphasis on proper grouting and there should not be leakage, seepage in roof after installation of plant.

9.0 MODULE MOUNTING STRUCTURE

The mounting structure would be designed to sustain wind loading of up to 150Kmph and shall be protected by using Eco friendly anticorrosion on structure. The entire structure including array will be earthed to an independent pit with redundant paths. Mounting Structures with fixed/adjustable tilt has been proposed. The Hardware shall be made of SS material or as per manufacturer standard.

a) The structure design shall be appropriate and innovative and must follow the existing structure and profile
b) Design, drawing with material selected shall be submitted for prior approval of engineer in- charge.
c) The structure shall be designed to allow easy replacement of any module.
d) The structure shall be designed for simple mechanical and electrical installation. It shall support SPV module at a given orientation, absorb and transfer the mechanical loads to the roof properly.
e) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
f) Nut & bolts supporting structure including module Mounting Structures shall have to be adequately protected with atmosphere and weather prevailing in the area; Nut bolts should be especially in SS material.
g) The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings.
h) The drawings along with detailed design shall be submitted in three sets to the engineer- in- charge for approval before starting the execution of work. The work will be carried out as per designs approved by the engineer in-charge.
i) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time and the maximum clearance of the structure from the roof level should be 300 mm.

10.0 POWER CONDITIONING UNIT (PCU)

Power Conditioning Unit (PCU) is critical equipment in Grid Connect SPV Power Plant. This equipment converts DC power generated by SPV array, into single phase/three phase medium voltage AC to be connected to Grid. It also provides necessary protections for Grid Synchronization and Data Logging/Monitoring. The DC energy, thus produced has to be utilized to maximum and supplied to the DC bus for inverting to AC voltage with the help of Power Conditioning Unit using its MPPT (The efficiency of MPPT shall not be less than 97% & shall be designed to meet the Solar PV Array capacity control) to extract maximum energy from solar array and provides 415V AC, 3-ph 50Hz to synchronize with local grid.

a. The PCU shall have protection features such as, over current, short circuit, over temperature to name a few.
b. The PCU shall be of very high quality having high efficiency (>92%) and shall be capable of running in isolated mode.
c. The PCU should be designed to be completely compatible with the SPV array voltage and grid supply voltage.
d. The PCU should be designed for continuous, reliable power supply as per specifications.
e. The PCU shall have internal protection arrangement against any sustained fault.

f. The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the detailed technical specification submitted by contractor within 1st milestone.

g. It should have user friendly LCD display for programming and view on line parameters such as DC power input, DC input voltage, DC current, AC power output, AC voltage and AC current and Power factor.

h. The PCU shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.

i. The Grid connect PCU shall be sourced from internationally reputed firms, which will incorporate latest Technological advances to provide highly reliable and efficient energy conversion from DC to AC. The PCU incorporates a new system design which uses multiple power stacks which work in tandem. The PCU should be Single phase static solid state type power conditioning units/string inverters suitability connected & synchronized to give three phase supply output. Both AC & DC lines shall have suitable fuses/MCBs and contactors to allow safe start up and shut down of the system. Fuses/MCBs used in the DC circuit should be DC rated. The PCU shall have provision for input and output isolation. Each solid-state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.

AC side

Nominal AC power	As per Manufacturer design
Output AC Voltage	330V/ 415V with a variation $\pm$ 10% at nominal voltage
Frequency	50 c/s (Hz) $\pm$ 5%
Total Harmonic Distortion	<3%
Under frequency protection	Yes
Under Voltage Protection	Yes
PV Power	As per Manufacturer design
Maximum DC Voltage	As per Manufacturer design
MPPT voltage range	As per Manufacturer design
Maximum DC Current	As per string rating
DC over voltage protection	Yes
DC Voltage ripple	<3%
Minimum Efficiency (CE)	>95%
Ambient temperature range	0-50°C
Humidity (non condensing)	30-95%
Degree of protection	IP21 for internal units and IP 66 for outdoor units
Dimensions approx (HXWXD	As per Manufacturer design
Weight	As per Manufacturer design
Recommended LCD Display on Front Panel	Accurate displays on the front panel:
	DC input voltage
	DC current
	AC Voltage (all3phases, in case of 3 phase)
	AC current (all3phases in case of 3 phase)

	Ambient temperature
	Instantaneous& cumulative output Power
	Daily DC energy produced
	Battery Voltage (in case of Hybrid PCU)
	Solar charge current and ambient temperature,
	Individual power temperature, stage heat sink and cabinet.
	YT
	Solar Radiation (with external pyranometer with in scope)
	- Inverter on
	- Grid on
	- Inverter under voltage/over voltage
	- Inverter over load
	- Inverter over temperature.
Communication interface	RS485/ RS232 PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array to the power conditioning unit/inverter should also be DG set interactive.
Power Factor	> 0.9
Test Certificates	The PCU/ inverters should be tested from the MNRE approved test centres / NABL /BIS /IEC accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

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

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

1 When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode.

2 The PCU control shall prevent excessive cycling of shut down during insufficient solar radiance.

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

i. Neutral voltage displacement
ii. Over current
iii. Earth fault

iv. Reverse power

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

m. PCU / Inverter should be tested from the test centres / NABL / BIS / IEC accredited testing calibration laboratories.

11.0 WIRING

1. All instruments and Panel wiring shall be of heat resisting and self-extinguishing type in compliance with IS. Plastic or porcelain cleats of the limited compression type shall be used for holding wiring runs. All wires shall be suitable for bending to meet the terminal studs at right angles. Metal cases of all apparatus mounted on panels shall be separately earthed.

2. The following colour scheme of the wiring shall be used as per IS: 375.

a) AC three phase circuits:

i) No.1 Phase: Red. No.2 Phase: Yellow. No.3 Phase: Blue
ii) Neutral Conductor: Black
iii) Connection to Earth: Green b) D.C. circuits: Grey

12.0 CABLE ACCESSORIES

a. Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted.
b. Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles. The panels‟ bottoms should be properly sealed to prevent entry of snakes/lizard etc. inside the panel.
c. The terminal end of cables and wires are to be fitted with good quality numbered ferrules of proper sizes so that the cables can be identified easily.

13.0 INTEGRATION OF PV POWER WITH GRID:

a. In this case, Power plant is without battery bank (i.e. with string inverter), the existing uni-directional meter of the user shall be installed for gross metering of solar generation while a Bi- directional meter shall be installed for net-metering purpose or conditions pertaining to Net Metering Policy of CREST.

b. CEA guideline 2013 or latest for interconnecting solar power with Grid shall be followed.

c. Certification of Islanding protection in the inverter/PCU from the manufacturer of the equipment shall be mandatory. This shall be arranged by the supplier from the manufacturer.

d. Verification report/test report shall be issued by the DISCOM or their authorized agency.

14.0 DATA MONITORING OF POWER PLANT:

a. PCU to log the inverter performance data and transmits the same to the Data logger.
b. Data logger shall then gather information and monitor the performance of the inverter. It shall also supports measurements from the external sensors. The data can be acquired remotely via modem.

15.0 LIGHTNING & OVER VOLTAGE PROTECTION

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

The Lightning Conductors shall be made as per applicable Indian Standards in order to protect the entire Array Yard/Shed from Lightning stroke. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to maximum wind speed and maintenance requirement at site in future.

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

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

For each earth pit, necessary Test Point shall have to be provided. The items of lighting protection will be paid as per BOQ item.

16.0 EARTHING SYSTEM

a. Each array structure of the SPV shall be grounded properly. The array structures are to be connected to earth pits as per General Specifications. Junction boxes shall be connected to the main earthing conductor/ electrode.

b. Earthing system installation shall be in strict accordance with IE rules as amended up to date.

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

d. In compliance to Rule 33 and 61 of Indian Electricity Rules, 1956 (as amended up to date) all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

e. Earth resistance of the earth pits shall be tested in presence of the representative of Engineer-in-charge.

17.0 AC DISTRIBUTION BOX (ACDB)

a. All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.

b. The change-over switches, cabling work, Manual isolation of Inverters/Grid should be undertaken by the bidder as part of the project within quoted rates.

18.0 DATA ACQUISITION SYSTEM / PLANT MONITORING

a. Web based remote monitoring which shall also be linked with servers of client / Board or software such as SCADA monitoring system must be provided by Bidder. If needed access to MNRE/CREST shall also be provided.

b. PV array energy production: Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system shall be provided.

c. All instantaneous data shall be shown on the computer screen.

d. The bidder must take approval/NOC from the Concerned DISCOM for the connectivity, technical feasibility, and synchronization of SPV plant with distribution network and submit the same before commissioning of SPV plant. Nothing extra shall be paid on this account.

19.0 PRIORITY FOR POWER CONSUMPTION:

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

20.0 GRID ISLANDING:

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

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

21.0 PAINTING & FINISHING

a. All metal surfaces shall be thoroughly cleaned of rust, scale, oil, grease, dirt etc. Fabricated structures shall be pickled and then rinsed to remove any trace of acid. The under surface shall be made free from all imperfections before undertaking the finishing coat.

b. After Phosphate treatment, two (2) coats of yellow zinc chromate primer shall be applied followed by two (2) coats of epoxy based synthetic enamelled paint. Shade shall be Siemens Grey RAL – 7032. Thickness of paint shall be not less than 75 micron.

c. All unpainted steel parts shall be cadmium plated or suitably treated to prevent rust formation. If these parts are moving elements then they shall be greased.

22.0 STANDARDS FOR SOLAR PHOTOVOLTAIC (PV) POWER PLANTS/SYSTEMS

A. PV MODULES:

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

Crystalline Silicon Terrestrial PV modules

IEC 61215/ISI 14286 Thin Film Terrestrial PV modules
IEC 61646 Concentrator PV Modules & Assemblies
IEC 62108

In addition, the modules must conform to IEC 61730 Part1-requirements for construction & Part 2 – requirements for testing, for safety qualification.

PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) must qualify. Salt Mist Corrosion Testing as per IEC 61701.

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

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

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

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

1.0 TECHNICAL SPECIFICATIONS		
SECTION – IV		
1.1 SPECIFICATION FOR SPV PANEL		
Sl. No	**Description**	**As per NIT**
1	Max. output (Pmax) as per STC	320-330 Wp ± 5%
2	Voc/Isc	45.96V/8.75A
3	MPP Voltage (Vmpp) V	37.65
4	MPP current (imp) A	8.5
5	Open circuit voltage (Voc)V	45.96
6	Normal operating cell temperature	44± 2 °C
7	Module dimensions (LxWxH) Appx.	As per manufacturer
8	PV Module type	Mono/Poly Crystalline
9	No. of PV cells per Module	As per manufacturer
10	Min. efficiency of module	18%
11	Solar module frame material	Aluminium
12	Weather resistant junction	IP65
13	Glass	Toughened
14	Glass iron content	Low Iron
15	glass transmissivity	High transmissivity
16	Frame	Anodized aluminium
17	Encapsulation	Ethyl Vinyl Acetate (EVA)
18	Trilaminate back surface	Tedlar / Polyester
19	By-pass diode	To be provided
20	Standard	IEC 61215 / IS 14286 & IEC 61730 Part 1 & Part 2
21	Performance guarantee	10 years of 90% power output 25 years of 80% power output 10 years against manufacturing defects.

1.1 SPECIFICATION OF SOLAR INVERTER (GRID TIED)		
Sl. No	**Description**	**As per NIT**
1	Type	Grid tied
2	Max. DC Array Input Voltage	1000V
3	DC voltage tolerance	`-20%+15% of the DC array input voltage in Sr. No. 1 above
4	Type of solar charge controller	MPPT based solar charge controller
5	Switching Device	MOSFET / IGBT BASED
6	Continuous inverter output rating	50 KWp
7	Output wave form	Pure Sine wave output
8	total harmonic distortion	< 3% with resistive load
9	Nominal AC output voltage and frequency	415V, 3 phase, 50Hz
10	Output frequency	50 Hz + 0.5 Hz
11	Grid frequency tolerance	`+3%
12	Grid frequency synchronization range	`+ 3Hz
13	No-Load losses	<1%
14	Power factor	> 0.9
15	PCU efficiency	>97 % at nominal voltage & power
16	Noise level	< 57 db
17	Certifications	IEC 61727, CE, IEC 62109-1, IEC 62109-2
18	Idle current	< 4 % of rated capacity
19	Regulation	Line regulation and load regulation -2%
20	Over load features	150% for one minute'
21	Cooling	Forced air cooling with temperature controlled cooling
22	Operating Temperature	(-)20°C to 50°C
23	Relative Humidity	95% Maximum
24	LED/LCD display	Indications display shall indicate system functional parameters and protection functional indicators.
25	Data Monitor and display controls	RS 485, Ethernet or RS 232 connectivity
26	Protections	1) Input over Voltage 2) Low/High frequency 3) Short Circuit 4) Under/over output voltage 5) Over Temperature 6) Grid input under voltage/over voltage with auto recovery 7) DC disconnect device 8) DC reverse polarity 9) Anti Islanding protection as per the standard
27	Enclosure Protection Safety	IP 65 (for outdoor) Galvanic isolation at input & output through transformer
28	Warranty	10 years.

1.2 SPECIFICATIONS FOR PV PANEL SUPPORT STRUCTURE		
Sl. No	**Description**	**As per NIT**
1	Material	Hot dip galvanized steel
2	Thickness of member	4mm
3	Over all dimensions	As per manufacturer standard
4	Wind rating	150Km / hour
5	Tilt angle and adjustment	25° Portrait
6	Peach of structure	Max. 7 Mtr or as per manufacturer standard
7	Hard wears & fastener	SS 304
8	Foundation	CC 1:2:4

1.3 TECHNICAL PARTICULARS OF ENERGY METERS		
Sl. No	**Description**	**As per NIT**
1	Applicable IS	IS 13779 or IS 14679 depending upon accuracy of meters.
2	Accuracy Class Index	0.5 or better up to 650 V
3	Display	LCD
4	Power factor range	Zero lag –unity- zero lead
5	Display parameters	Display parameters : LCD test, KWH import, KWH export, MD in KW export, MD in KW import, Date & Time, AC current and voltages and power factor (Cumulative KWH will be indicated continuously by default & other parameters through push-button)
6	Power Consumption	Less than 1 Watt & 4VA in Voltage circuit and 2 VA for Current circuit.
7	Frequency	50 Hz with + / - 5% variation
8	MD Registration	a) Meter shall store MD in every 30 min. period along with date & time. At the end of every 30 min, new MD shall be compared with previous MD and store whichever is higher and the same shall be displayed. b) It should be possible to reset MD automatically at the defined date (or period) or through MRI. c) Manual MD resetting using sealable push button is an optional.
9	Memory	Non-volatile memory independent of battery backup, memory Should be retained up to 10 year in case of power failure.
10	Climatic conditions	a) As per IS: 13779 or IS: 14697 for climatic conditions. b) Thermometer should function satisfactorily in India with high end temperature as 50oC and humidity up to 95%.
11	Insulation	A meter shall withstand an insulation test of 4 KV and impulse test at 8 KV
12	Battery	Lithium with guaranteed life of 15 Years

(ANNEXURE-I)

TECHNICAL SPECIFICATIONS

1.1 SPECIFICATION FOR SPV PANEL		
Sl. No	**Description**	**To be filled bidder**
1	Make	
2	Max. output (Pmax) as per STC	
3	Voc/Isc	
4	MPP Voltage (Vmpp) V	
5	MPP current (imp) A	
6	Open circuit voltage (Voc)V	
7	Normal operating cell temprature	
8	Module dimensions (LxWxH) Appx.	
9	PV Module type	
10	No. of PV cells per Module	
11	Min. efficiency of solar cell	
12	Solar module frame material	
13	Weather resistant junction	
14	Glass	
15	Glass iron content	
16	glass transmissivity	
17	Frame	
18	Encapsulation	
19	Trilaminate back surface	
20	By-pass diode	
21	Standard	
22	Performance guarantee	

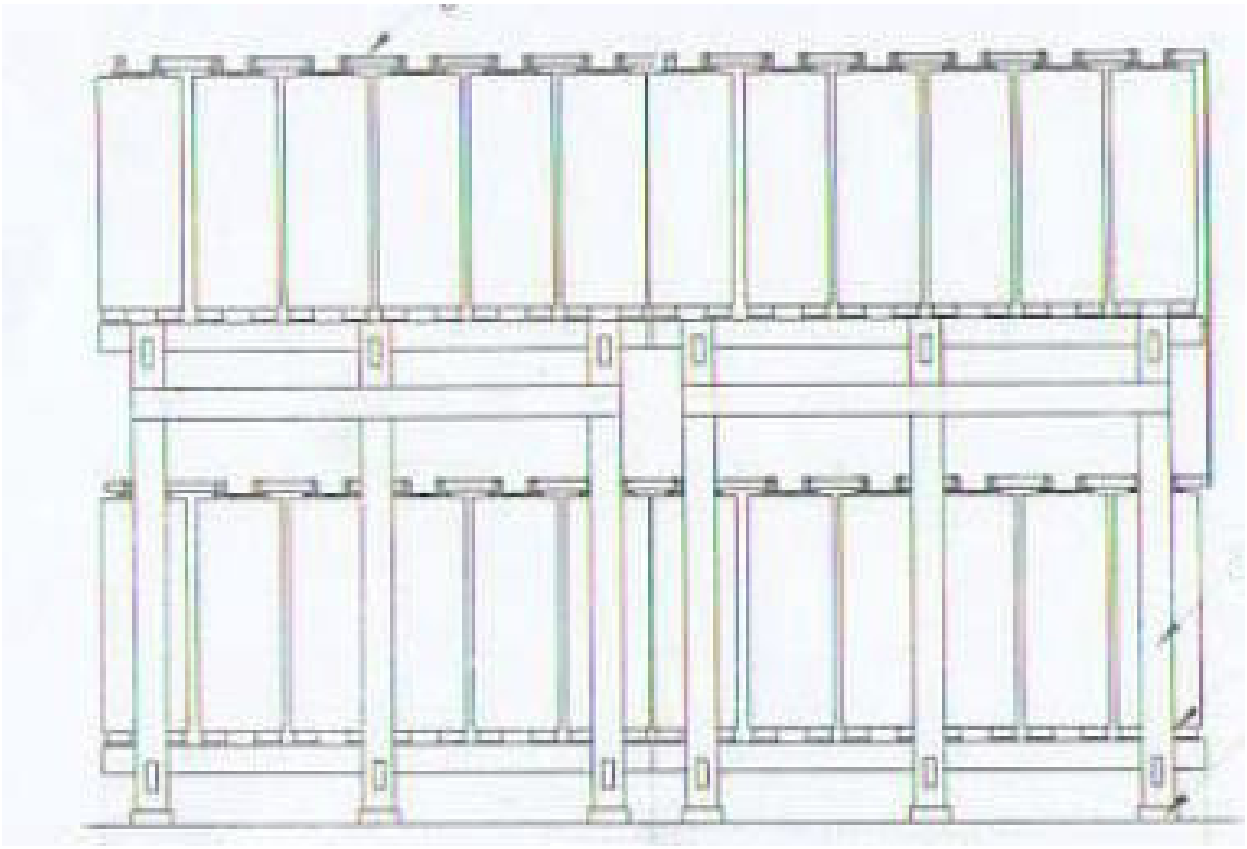
SPECIFICATION OF SOLAR INVERTER (GRID TIED)

Sl.No.	Description	To be filled bidder
1	Make	
2	Type	
3	Max. DC Array Input Voltage	
4	DC voltage tolerance	
5	Type of solar charge controller	
6	Switching Device	
7	Continuous inverter output rating	
8	Output wave form	
9	total harmonic distortion	
10	Nominal AC output voltage and frequency	
11	Output frequency	
12	Grid frequency tolerance	
13	Grid frequency synchronization range	
14	No-Load losses	
15	Power factor	
16	PCU efficiency	
17	Noise level	
18	Certifications	
19	Idle current	
20	Regulation	
21	Over load features	
22	Cooling	
23	Operating Temperature	
24	Relative Humidity	
25	LED/LCD display	
26	Data Monitor and display controls	
27	Protections	1)
		2)
		3)
		4)
		5)
		6)
		7)
		8)
		9)
28	Enclosure Protection Safety	

SECTION – V

SPECIAL CONDITIONS (MAINTENANCE & OPERATION)

TYPICAL MODULE MOUNTING STRUCTURE



1.0 TYPICAL MODULE MOUNTING STRUCTURE

a. MS Galvanized mounting structure is to be used as per requirements of this project and maximum nos. of modules is to be installed in min. area.

b. The proposed structure should be designed in such a manner that modules can be installed, replaced & Service easily in future. The offered Module Mounting Structures should be in line with site requirements.

c. Proposed Mounting Structure will support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly and will not have any requirement of welding or complex machinery at site.

d. The structure is designed in such a way that it will take less space and will withstand wind load up to 150kM/hr or may be designed as per site requirement (whichever is more).

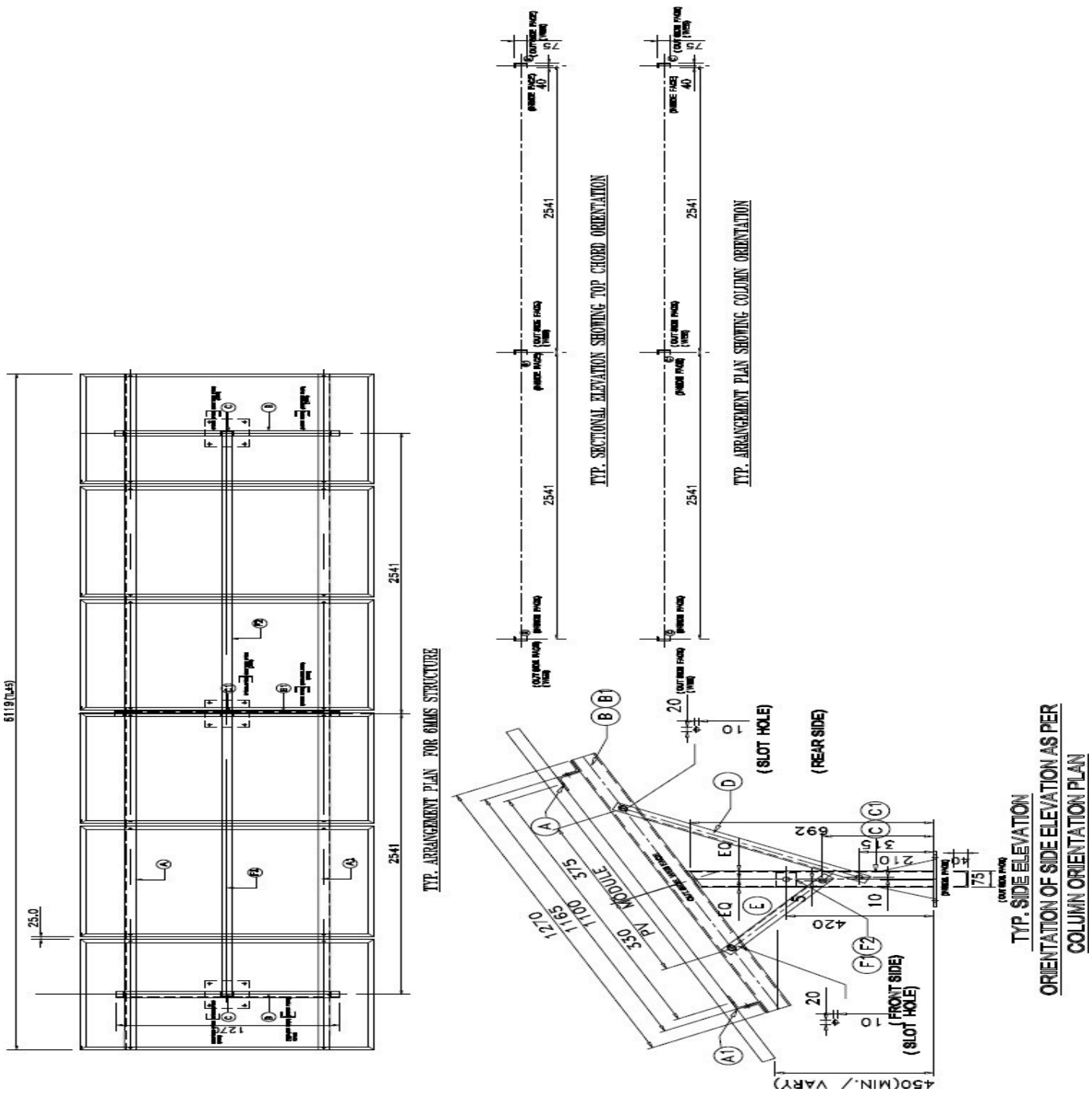
e. Adequate spacing shall be provided between any two modules secured on PV panel for Improved wind resistance.

f. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.

g. PV modules shall be secured to support structure using screw fasteners and/or metal clamps. Module fasteners/clamps shall be adequately treated to resist corrosion.

h. All fasteners, nut and bolts are made of Stainless steel - SS 304.

GENERAL DESIGN FOR 6 MODULE MOUNTING STRUCTURE IS SHOWN BELOW (FOR REFERENCE ONLY).



LIST OF APPROVED MAKES FOR EQUIPMENT & MATERIALS

S.NO.	DETAILS OF MATERIALS/ EQUIPMENT	MANUFACTURER'S NAME
A.	**SOLAR EQUIPMENT**	
1.	SPV Modules	Schneider Moser Baer Tata BP Solar CEL BEL Reliance/GE/Solar/Sanyo
2.	Power Control Unit(PCU)String PCU	EMERSON MITSHUBISHI SCHNEIDER Delta SMA (America)
B.	**MEDIUM VOLTAGE EQUIPMENT**	
1.	Power Distribution Panel	Local Fabrication approved by Engineer In- Charge
2.	Moulded Case Circuit Breaker (MCCB) 3&4 Pole With rotary operating mechanism	Schneider Electric (Compact NX) ABB (T-Max) Larsen & Toubro (D-Sine) Siemens (Sentron-VL)
3.	Miniature Circuit Breaker (MCB)	Schneider Electric (MG)-Multi-9 ABB GE Power Controls Hager (L&T) Legrand Siemens
4.	Residual Circuit Breaker (RCCB/ RCBO's)	Schneider Electric (MG)-Multi-9 ABB GE Power Controls Hager (L& T) Legrand Seimens
5.	Power/ Aux. Contractor 3 / 4 Pole	Schneider Electric (Telemechanique) ABB GE Power Controls Larsen & Toubro Siemens
6.	Indicating Lamps LED type, Push Button	Schneider Electric (MG) Vaishno Electricals Larsen & Toubro (ESBEE) Siemens
7.	Electronic Digital Meters (A/V/PF/HZ/KW/KWII) Conzerv (Networkable)	L & T Schneider Electric Secure

8.	XLPE insulated PVC sheathed copper conductor Armoured power cable of 1.1 KV grade	Polycab KEI Havells Grandley
9.	LT Jointing Kit/Termination	Raychem M Seal
10.	Cable Glands Double Compression with Earthing Links	Comet Cosmos
11.	Bimetallic/ Copper/ Aluminium Cable Lug	Comet Dowell's (Biller India Pvt. Ltd.) Hax Brass (Copper Alloy India Ltd.)
12.	PVC insulated copper conductor stranded flexible FRLS wire (pre twisted)	Finolex KEI Polycab
13.	DC Cables and Wires	KEI/ LAPP/Siechaem /Top Solar/ Nexans
14.	Polycarbonate Junction Boxes	Hensel Clipsal Sintex ABB
15.	Selector Switch, Toggle Switch	Salzer (L & T) Siemens Kaycee/
16.	Timer	GE Siemens L & T Schneider Electric-TE
17.	Material for Structure	TATA/JINDAL/SAIL
18.	SCADA	Siemens/ Honey Well/ Rock Well/ GE/ Schneider
19.	Weather Monitoring Station	KIPS & ZONEN/ SIVARA/ AEON/ Tran slab

SCOPE OF WORK:

SL.No.	Description of items
1	Supply, Installation, Testing and Commissioning of 100 KWp Mono/ Poly Crystalline silicon solar cells confirming to MNRE specification on grid with net metering facility mounted on aluminium/GI structure of suitable strength Solar PV power plant generating system complete with supply and installation of following components including supply and fixing of SPV Module as required: -
a.	Solar Photo Voltaic Module 330Wp or more modules confirming to IEC 61215-1, IEC 61730-1, IEC 61730-2 -1 Sets of 50 KW
b.	Power Conditioning Unit (PCU) of 350-1000 VDC Input Volt Range and 400V AC, three phase 4 wires, 50Hz, output voltage suitable to generate 100 KW AC Power. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency- 1 Nos.
c.	Data Monitoring System complete with accessories – 1Lot
d.	DC Array junction box & Main junction box with IP 65 protection, and termination arrangement for incoming and outgoing cable along with gland, lugs and other accessories etc. as reqd. -1 Lot
e.	Lightning and surge voltage protection – 1 Nos.
f.	Connection & Interconnection by supplying & fixing all XLPE insulated copper conductor 1.1. KV grade armoured power and control cables between solar modules, main power cable to grid supply PCU units along with supplying & fixing of necessary PVC channel/ conduit lugs and other accessories etc. as reqd. – 1 Lot
2	Supply, Installation, Testing & Commissioning of Floor mounted Power Distribution Panel suitable for 440V, 3 phase, 4 wire, 50 Hz AC supply system, TPN aluminium bus bar with DMC / SMC support, with short circuit withstand capacity of 31 MVA for 1 sec, fabricated, in compartmentalized design (Form-4b) having IP-54 rating, fabricated as per DCI specifications, made out of CRCA sheet steel of 2 mm thick duly powder coated in approved shade after cleaning & finishing with 7 tank process for following rating Incomer Switch, following depth, following rating bus bar and for any number of outgoing feeders, control wiring for metering , BMS monitoring of input parameters including supplying & fixing of MFM of 96 mmsq with suitable rating CT for measuring V,A,KVA,KWAH, KVARH etc and LED type indicating lamps for RYB,ON/OFF with protective MCBs for incomer, rotary handles for incomer &outgoing MCCBs, i/c base channel of M.S. Section not less than 100mm x 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common GI earth bar of size 50mm x 5 mm at the rear with 2 no's earth stud, cable glands plates in two halves , fixing of switchgears with solid connections from main bus bar to switchgears with required size of Al. bus bars and aluminium bus bar/copper wire between switchgear and connecter in cable alley complete with earthing ,labelling etc as reqd. **(Note:- cost includes all fabrication material and Switchgears like MCB/MCCB)** **(Note:- Front face area of panel shall be 1- sq.mtr .)**
a.	Incomer MCCB- 200Amp, Bus bar rating - 300 amps, Depth of panel- 300 mm, Outgoing MCB/MCCB- as per design)

3	Supply following rating MCCB Confirms to IS/IEC 60947-1, IS/IEC 60947-2, IS/IEC 60947-3, IS/IEC 60947-4with thermal-Magnetic Release for fixing in Cubical panel complete as reqd. **(Note:- Cost of labour for installation included in cost of fabrication of panel)**
a.	250 Amps,25KA (icu=ics) Triple Pole
4	Supply of 1.1 KV grade XLPE insulated PVC sheathed armoured Aluminium cable of following sizes and core, conforming to IS 1554 Part I complete as reqd.
b.	3.5 Core x 70 sq.mm
5	Laying and fixing of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1 kV grade of following size on wall surface as required.
a.	Above 35 Sq.mm and up to 95 sq.mm (clamped with25x3mm MS flat clamp)
6	Supplying & making end termination with brass compression gland and copper lugs for following size PVC insulated & PVC sheathed/ XLPE armoured 1.1 KV grade power cable etc. as reqd.
a.	3½ x 70 sq.mm
7	Earthing with GI earth plate 600mmx600mmx6mm thick i/c accessories and providing masonry enclosure with cover plate including locking arrangement and watering pipe of 2.70 mtrs long etc. with charcoal/coke and salt as reqd.
8	Providing & fixing 25mmx5mm GI strip in 40mm dia GI pipe from earth electrode i/c connection with GI nut, bolt, spring washer excavation & re-filling, repairing the damages etc. as reqd.
9	Providing fixing 25mmx5mm GI strip on surface or in recess for connection etc. as reqd.
10	Providing & fixing of lighting conductor finial made of 25mm dia 300mm long GI tube having single prong at top with 85mm dia, 6mm thick GI base plate i/c holes etc. complete as reqd.
11	Providing & fixing GI tape 20mmx3mm thick on parapet or surface of wall for lightning conductor complete as reqd.
a.	Vertical run
b.	Horizontal run
12	Providing & fixing 6 SWG dia GI wire on surface or in recess for loop earthing along with existing surface/recessed conduit/ submain wiring/cable as reqd.

FORM OF BANK GUARANTEE BOND FOR SECURITY DEPOSIT.

(To be executed on Rs. 100/- Non-judicial stamp paper)

In consideration of dredging Corporation of India Limited, a Company incorporated under the company Act 1956 and having its registered office at Core-2, Floor, Scope miner, plotNo.2A & 28, Laxmi Nagar District centre, Delhi-110091 (herein after called the DCI having agreed to exempt. M/s. ---------- (indicate name & full address of the tenderer) (hereinafter called the said "Tenderer")From payment under the terms and conditions of the tender dated.----------No.----------made between the DCI. And the tender for ----------(here in after called the said "tender") of earnest money deposit in cash for the due fulfilment by the said tenderer of the terms and conditions contained in the said tender on production of a bank Guarantee for Rs.----------(Rupees.----------Only).

1.We ----------(indicate the name of bank) (here in after referred as the bank) at the request of M/s.---------- the said tenderer do here by undertaking to pay to the DCI an amount not exceeding Rs.---------- against any loss or damage caused to or suffered or would be caused to or suffered by the DCI by reason of any breach by the said tenderer of any of the terms of conditions contained the said tender.

2. We ---------- do here by undertaking to pay the amounts due and (indicate the name of Bank)----------Payable under this guarantee without any demur, merely on a demand from the DCI stating that the amount claimed is due by way of loss or damage caused to or damage caused to or said tenderer of any of the terms or conditions contained in the said tender. Any such demand made on the bank shall be conclusive as regards the mounts due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs,

3. We undertaking to pay to the DCI any money so demanded not withstanding any dispute or disputes raised by the said tenderer in any suit or proceeding pending before any course or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment made by us under this bond shall be valid discharged of our liability for payment there under mind the said tenderer shall have no claim against us for making such payment.

4. We----------(indicate the name of bank) Further agree that the guarantee here in contained, 1 all remain in full force and effect during the period that would be taken for the performance of the said tender and that it shall continue to be enforceable ill all the dues of the performance of the OCI under off by virtue of the said tender have been fully paid and its claim satisfied or discharged for till the DCI certifies that the terms and conditions of the said tender have been fully and properly carried out by tile said tender and accordingly discharged this guarantee. Unless a demand of claim under this guarantee is made on I/s in written on or before ----------, we shall be discharged from nil liability under this guarantee thereafter.

5. We ----------(indicate the further agree that the DCI shall have the fullest liberty without our consent and with our affecting in any manner our obligations here under to vary any of the terms and conditions of the said tender or to extend time to time any of the terms and conditions relating to the said tender by the DCI against to the said tenderer and to forbear or enforce any of the terms and reason of any such variation or extension being granted to the said tenderer of for any forbearance, act or omission on the pan the DCI or any indulgence by the DCI to the said tenderer or by any such matter or thing whatsoever which under the law relating to sureties would, but (or this provision, have effect of so relieving us.

6. This guarantee will not be discharged to the change in the condition of the bank or the tenderer.

7. We,---------- (indicate the name of bank) lastly undertake not to revoke this guarantee during its currency expect with the previous consent of the DCI in writing.

Date the ---------- day of ---------- 2020

For ---------- (indicate the name of bank)

PROFORMA FOR BANK GUARANTEE FOR EARNEST MONEY DEPOSIT

(TO BE EXECUTED ON NON-JUDICIAL STAMP PAPER WORTH OF. Rs 100/.)

To,

The Dredging Corporation of India Ltd,
"Dredge House ", Port Area,
Visakhapatnam /530001

Whereas ----------(indicate name &full address of the tenderer) (here in after called the "tenderer ") has submitted its tender dated ---------- for the Execution of (Name of work) In favour of DREDGING CORPORATION IF INDIA LIMITED, Dredge House, Port Area, Visakhapatnam-530001 (here in after called the "corporation").
Know all men by these present that we,
(Bankers full address)(here after called "bank") are bound unto the corporation for the sum of Rs. xxxxxxxxx(Rupees only) for which payment will and truly to be made to the said corporation, the bank binds itself its successors and assigns by these present.

THE CONDITIONS of this obligation are:

If the tenderer withdraws his tender

(a)During the period of validity of me tender specified in me tender (or)

(b) After having been notified of the acceptance of his tender by the corporation during me period of tender Validity.

2. Fails or refuses to execute the Agreement, if required. Or do not commence the work as per the letter of Intent or work order.

We undertake to pay to the Corporation up to the above amount upon receipt of their first written demand without the corporation having to substantiate their demand, provided mat in their demand the Corporation will note that the amount claimed is due 10 him owing to the occurrence of one or more of the above conditions, specifying the occurred condition or conditions.

Notwithstanding anything here in contained our liability under this guarantee is limited to Rs.----------(Rupees ----------only) and will remain in force up to 90 days from the date of opening of tender and any demand in respect thereof must reach the bank not later than me date of expiry of this guarantee failing which all the rights of the Corporation under the guarantee shall be forfeited and the bank shall be deemed to be relieved or discharged from all liabilities here under.

PROFORMA- I

Date:

To
M/s. Dredging Corporation of India Ltd.,
"Dredge House ". Port Area,
VISAKHAPATNAM-530001.

Sir,

Sub: Tender for Roof Top Solar Power Plant –Reg.

– – –

With reference to your Tender No. DCI/HR/06/E/Solar/2019 Dated. / /2020 and as per CI. No. 29 of general & Special conditions of the contract, we here by certify that we are not related to ay officer of Dredging Corporation of India Ltd., or any officer of the rank of the Asst. Secretary or above in the Ministry of Shipping, Government of India and also certify that we do not have any relatives employed in the Dredging Corporation of India Ltd.,

Thanking you,

Yours faithfully,

PROFORMA-II

Date:

To
M/s. Dredging Corporation of India Ltd.,
"Dredge House", Port Area,
Visakhapatnam -530001.

Dear Sirs,

Sub: Tender for Roof Top Solar Power Plant -Reg.

With reference to your tender No. DCI/HR/06/E/Solar/2019 DT / /2020 And as per clause No 30 of general & special conditions of the contract, we here by certify that we have not made any payment of illegal gratification to any person /authority connected with the bid process so as to influence the bid process and have not committed any offence under the
prevention of Corruption Act in connection with the bid.

Thanking you,

Yours faithfully,

BILL OF QUANTITY:

SL NO	DESCRIPTION	QTY	HSN/SAC (to be filled by supplier)
1	TOTAL COST FOR SITC OF SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 100 KWP SOLAR PV POWER PLANT GENERATING SYSTEM AT DCI, AOB AS PER STANDARDS MENTIONED IN THE SCOPE OF WORK AND OTHER TENDER TERMS.	01 LUMPSUM	

NOTE:

The items mentioned are required for installation of 100 KWp capacity grid connected roof top solar power plant at DCI, AOB, Dredge House, Port Area, Visakhapatnam- 01. The roof top area available in two different blocks.

Block A consists of Ground +5 upper floors

Block B consists of Ground+ 1 upper floor

The main panel board and other electrical equipment are housed in Block-A

All the cables, other electrical items required to complete the 100KWp solar plant are to be assessed accordingly by visiting the site. The tenderer should take in to consideration of the above before submitting their quote

The tenderer should take into consideration the equipment/ materials required for 100KWp roof top solar power plant and its related works/ materials required to complete the project in all respects other than the items mentioned in this SCOPE OF WORK also, if any.

Keeping the position of PCU, PDB and other equipment in the site as per the site conditions, etc, the tenderer after inspection of site may arrive the quantities in respect of cables, etc as mentioned in the SCOPE OF WORK and quote accordingly as lump sum amount for the complete project.

The tenderer has to follow the specifications mentioned in the SCOPE OF WORK and also the make/ brands mentioned in the tender documents strictly. If tenderer quotes for brands/ make other than mentioned in the tender documents will not be considered.