

**NATIONAL INSTITUTE OF RURAL DEVELOPMENT & PANCHAYATI
RAJ (Ministry of Rural Development, Government of India)
Rajendranagar – Hyderabad 500 030**

E- TENDER FOR

Supply, Installation, Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@ NIRDPR Campus, Hyderabad.

1. Online bids are invited by the EXECUTIVE ENGINEER- NIRDPR, National Institute of Rural Development, RajendraNagar, Hyderabad 500 030 on behalf of Director General, NIRDPR from approved and eligible contractors of CPWD (or) Manufacturers of SPV crystalline module (or) Approved MNRE Channel partner with valid accreditation along with firm Registration(in both cases) issued by Registrar of firms

Bidding document No: EE/CMU/17-18/236	EMD for Rs. 5.00 lakhs
Bid document download/sale start date &	Bid submission due date and time
Publishing date: 01.11.2019 (12.00 PM)	11/11/2019 3.00 PM

2. The detailed Nit along with qualification criteria, EMD bidding document etc can be viewed /Downloaded from any of the given website: <http://eprocure.gov.in/eprocure/app>. Bidders are required to upload and submit their E-bid on Central Public Procurement Portal only. All amendments, time extension, clarification etc., will be uploaded in the website only and will not be published in newspapers. Bidders should regularly visit website to keep themselves updated.

F.No: EE/CMU/17-18/236

Sd/-
EXECUTIVE ENGINEER
NIRD&PR, Hyderabad-30

**NATIONAL INSTITUTE OF RURAL DEVELOPMENT & PANCHAYATI
RAJ (Ministry of Rural Development, Government of India)
Rajendranagar – Hyderabad 500 030**

E-Tender for

Supply, Installation, Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@ NIRDPR Campus, Hyderabad.

Online bids are invited under stage two bid system for the Supply, Installation, of 260 Testing, Commissioning kwp grid interactive Solar Photovoltaic Power Plant with Net System on the Roof Top metering facility of NIRD&PR Buildings, Hyderabad

1. Tender documents may be downloaded from NIRD&PR website <http://eprocure.gov.in/eprocure/app>. as per the schedule as given in Critical date sheet as under:

CRITICAL DATE SHEET

Published date	01/11/2019	12.00 PM
Bid document download/ sale start Date	01/11/2019	12.00 PM
Clarification start date	01/11/2019	12.00 PM
Clarification end date	11/11/2019	02.00 PM
Bid submission start date	01/11/2019	12.00 PM
Bid submission end date	11/11/2019	03.00 PM
Technical Bid opening date	13/11/2019	03.30 PM

2. Bids shall be submitted online only at CPPP website <http://eprocure.gov.in/eprocure/app>.

3. Not more than one tender shall be submitted by one contractor or contractors having business relationship. Under no circumstance will father and his son(s) or other close relations who have business relationship with one another (i.e. when one or more partner(s) / director(s) are common be allowed to tender for the same contract as separate competitors. A breach of this condition will render the tenders of both parties liable to rejection.

4. **Applicant contractor must provide demand draft for Rs. 5.00 lakhs (Rupees Five Lakhs rupees only) (to be purchased on or after publication date of this tender) in favour of NIRD, RajendraNagar, Hyderabad 500 030 and payable at Hyderabad obtained from any Nationalized/ scheduled bank with their application/ downloaded tenders towards Earnest Money Deposit. All applicable bank charges shall be borne by the applicant and he shall not have any claim what so ever on this account on government.**

5. The Hard Copy of original instruments i.e. Demand Draft in respect of earnest money deposit, other documents must be delivered to the EXECUTIVE ENGINEER- NIRDPR/, NIRD, RajendraNagar, Hyderabad 500 030 on or before bid opening date/ time as mentioned in critical date sheet Tenderer shall likely to be liable for legal action for non-submission of original payment instrument like DD etc. against the submitted bid.

6. Bids will be opened online as per date/ time as mentioned in the Notice Inviting Tender at Central Public Procurement Portal (<http://eprocure.gov.in/eprocure/app.>) after online opening of Technical-Bid the results of their qualification as well price bid opening will be intimated later.

Submission of Tender:

The tender shall be submitted online in two parts viz., technical bid and financial bid. The offers submitted by telegram/ Fax/ email shall not be considered. No correspondence will be entertained in this matter.

Instructions for Online Bid Submission:

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

More information useful for submitting online bids on the CPP Portal may be obtained at: <http://eprocure.gov.in/eprocure/app.>

Registration:

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

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Searching for Tender Documents:

1. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date value etc. there is also an option of advanced search for tenders wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date other keywords etc to search for a tender published on the CCP Portal.
2. Once the bidders have selected the tenders they are interested in they may download the required documents / tender schedules. These tenders can be moved to the respective “My Tenders” folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3. The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the helpdesk

Preparation of Bids

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

Submission of Bids:

1. Bidder should log into the site well in advance for bid submission so that he / she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. Bidder as to select the payment option as “offline” to pay the tender fee / EMD as applicable and enter details of the instrument

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4. Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/ couriered/ given in person to the Tender Processing section, latest by the last date of bid submission. The details of the DD/ any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
5. A standard price bid format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the file and quote the amount on hard copy. Once the details have been completed, the bidder should submit it online in form of soft copy, if the file is found to be modified by the bidder, the bid will be rejected.
6. The server time (which is displayed on the bidders dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should flow this time during bid submission.
7. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive field is done.
8. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
9. Upon the successful and timely submission of bids, the portal will give a successful bid submission message and a bid summary will be displayed with the bid no and the data and time of the bid with all other relevant details.
10. The bid summary has to be printed and kept at an acknowledgement of the submission of the bid opening meetings.

Assistance to Bidders:

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person contact details for tender related queries: Executive Engineer CMU.,NIRD&PR in office hours from 10:30 am to 5:30 pm on PH:040-24008555 ,Hyderabad.
2. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24 x 7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 73

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Part 1 : (Technical Bid)

The following documents are to be furnished by the Contactor in 1st Cover as per the tender document.

Scanned copies of the following

1. i. Scanned Copy Of approved and eligible contractors of CPWD/ Manufacturers of SPV crystalline module and having facilities and capacity and procedures including quality control who must have designed, manufactured and type tested and supplied 1 MW such modules (or)
 - ii. Approved MNRE Channel partner with valid accreditation along with firm Registration(in both cases) issued by Registrar of firms
2. Scanned Copy Of Bidders must submit the organization chart of the company clearly showing the details of Technical Personnel, Installation, Commissioning & COM capability, training set up etc
3. Scanned Copy Of The bidder should have experience of operation and maintenance of solar power stations cumulative capacity of 500 kW in India (Supported by client's AMC orders/ performance certificates .with Satisfactorily completed as prime contractor in similar nature of Three works of value not less 1.00 crore and Two works of value not less 1.50 crore One work of value not less 2.00 crore in last five financial year and submit a Certificate it has to be issued by Engineer-in-Charge of Government Department / undertaking not below the rank of EXECUTIVE ENGINEER or equivalent and counter signed by the rank of Superintending Engineer or equivalent and attested by Gazetted Officer .
Sub Contractors / GPA holders experience shall not be taken in to account
4. Scanned Copy of Availability of key personnel in statement VI.
5. Scanned Copy of Information regarding any litigation, with Government during the last five years, in which the Tenderer is involved in (Statement - VII)

Contractor

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6. Scanned Copy Of The tenderers shall be required to furnish **Checklist and declaration in**

Online starting that the soft copies uploaded by them are genuine. Any incorrectness / deviations noticed will be viewed seriously and apart from cancelling the work duly forfeiting the EMD, Criminal action will be initiated including suspension of business

7. Scanned Copy Of The bidder should produce the copy of Service Tax registration along with bid. To be attested by Gazetted officer

8. Scanned Copy Of Income Tax/ Pan card

9. Scanned Copy Of TIN No. Certificate/GST Registration

10. Scanned Copy Of The Demand Draft for Rs.5.00 lakhs towards Earnest Money Deposit (EMD).

11. Scanned copies of experience certificates issued by previous clients. (Optional)
The original demand draft towards Earnest Money Deposit and hard copy of the

above documents should be submitted on or before bid submission closing date and time to **Executive Engineer, NIRD&PR, Hyderabad.**

12. **BID CAPACITY:** The tenderer who meets the above qualification criteria and whose available bid capacity is more than ECV value will be qualified for opening of price bid. i.e $2AN-B > ECV$ Available bid capacity : $2AN-B$ where as "A" = Annual turn over in any one financial year during the last five financial years (updated to current price level) will be considered. "B" = Updated value (at current price level) of all Existing commitments i.,e ongoing works, Works likely to be awarded , works to be executed during the next 12 Months (Period of completion for which the tenders are invited.) "N" = No. of years prescribed for completion of work for which tender are invited (Period of completion / 12 Months).

13. Scanned Copy Of Annual turnover certificate issued by Executive Authority or certified by CA alongWith Saral form and , Profit & Loss Account in any one financial year during theLast five financial years . To be attested by Gazetted Officer

14. Scanned Copy Of CERTIFICATES IN SUPPORT OF EXISTING COMMITMENTS. To be attested by

Gazetted Officer

Contractor

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SCHEDULED OF QUANTITIES

Name of work: Supply, Installation , Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@ NIRDPRCampus,Hyderabad

1. Name of

a) Give brief description and : **Supply,Installation, Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System with Net metering facility on the Roof Top of NIRD&PR Buildings ,Hyderabad.**
location of work:

b) ECV put to tender : **Rs. 1.38 crores**

c) Period of completion : **4 months**

d) Details of provisions included in the ECV put to Tender

- (i) LA & LI at: Not applicable
- (ii) Seigniorage charges: Not Applicable
- (iii) Store shed: Nil
- (iv) Bore wells: Nil

e) Reimbursable Provisions.

Technical Personnel :

The EXECUTIVE ENGINEER- NIRDPR NIRD, Hyderabad invites tenders for the above work vide

NIT NO. _____ **Dated :**

To pay EMD in the shape of Demand Draft only for **Rs. 5.00 lakhs** issued by any Nationalised Bank/Scheduled Commercial bank in favour NRD **Hyderabad** to be valid for 3 months from the date of NIT along with bid and the Performance guarantee of 5% of tendered value and Security Deposit of 5% will be deducted from the successful bidder.

The tenderer shall invariably furnish the original DD towards EMD to the tender inviting authority at the time of concluding agreement either personally or through courier or by post and the receipt of the same within the stipulated time shall be the responsibility of the bidder. Department will not take any responsibility for any delay or non-receipt.

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- 1.1 The successful tenderer is expected to complete the work within the time period specified in the NIT.
- 1.2 The successful (L1) tenderer shall furnish the original hard copies of all the documents / certificates / statements uploaded by them before concluding the Agreement.

2. Firms Eligible to Tender:

- 2.1 The Firms who
 - i) Possess the valid registration in the class and category mentioned in the NIT and satisfy all the conditions therein.
 - ii) Are not blacklisted or debarred or suspended by the Government for whatever the reason, prohibiting them not to continue in the contracting business.
 - iii) Have complied with the eligibility criteria specified in the NIT are the eligible tenderers.

2.2 Firms Ineligible to Tender:

- i) A retired officer of the Govt. of AP/Telangana and any other states of India or Govt. of India executing works is disqualified from tendering for a period of two years from the date of retirement without the prior permission of the Government.
- ii) The Tenderer who has employed any retired officer as mentioned above shall be considered as an ineligible tenderer.
- iii) The contractor himself or any of his employees is found to be Gazetted Officer who retired from Government Service and had not obtained permission from the Government for accepting the contractor's employment within a period of 2 years from the date of his retirement.
- iv) The Contractor or any of his employees is found at any time after award of contract, to be such a person who had not obtained the permission of the Government as aforesaid before submission of the tender or engagement in the Contractor's service.
- v) Contractor shall not be eligible to tender for works in the division / circle where any of his near relatives are employed in the rank of Assistant Engineer or Assistant EXECUTIVE ENGINEER and above on the Engineering side and Divisional Accounts Officer and above on the administrative side. The Contractor shall intimate the names of persons who are working with him in any capacity or are subsequently employed. He shall also furnish a list of Gazetted /Non-Gazetted, State Government Employees related to him. Failure to furnish such information tenderer is liable to be removed from the list of approved contractors and his contract is liable for cancellation

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Note: Near relatives include

1. Sons, step sons, daughters, and step daughters.
2. Son-in-law, and daughter-in-law.
3. Brother-in-law, and sister-in-law.
4. Brothers and Sisters.
5. Father and Mother.
6. Wife / Husband.
7. Father-in-law and Mother-in-law
8. Nephews, nieces, uncle and aunts
9. Cousins and
10. Any person residing with or dependent on the contractor.

C to G --- Deleted

- h) Availability of key personnel for administration / site management and execution viz., technical personnel required for the work (Statement VI)

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- i) Information regarding any litigation, with Government during the last five years, in which the Tenderer is involved in (Statement - VII)
- j) -----Deleted -----
- k) The proposed methodology and program of construction, backed with equipment planning and deployment, duly supported with broad calculations, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.
- l) The particulars of quality control testing Lab owned, OR tie up with established quality control testing laboratories.

2.3 Tenders from Joint Ventures are not acceptable unless specifically stated otherwise.

2.4 QUALIFICATION CRITERIA FOR OPENING OF THE BID.

- a) i. approved and eligible contractors of CPWD/ Manufacturers of SPV crystalline module and having facilities and capacity and procedures including quality control who must have designed, manufactured and type tested and supplied 1 MW such modules. (or)
 - ii. Approved MNRE Channel partner with valid accreditation along with firm Registration(in both cases) issued by Registrar of firms.
- b) Bidders must submit the organization chart of the company clearly showing the details of Technical Personnel, Installation, Commissioning & COM capability, training set up etc.
- c) The bidder shall be an established agency having adequate experience in executing similar grid supported solar power projects in India on turnkey basis in the last Five years. (Evidence supported by Purchase Orders and Project completion certificates).
- d) e bidder should have experience of having set-up at least 0.5 MW solar power plants
- e) The bidder should be a manufacturer of SPV systems OR having an established tie up with a PV system manufacturing company for the past three years having capacity of manufacturing PV modules not less than 2 MWp (Supported by OEM certificates).
 - The bidder should have experience of operation and maintenance of solar power stations cumulative capacity of 500 kW in India (Supported by client"s AMC orders/performance certificates).
- f) To furnish copy of PAN card. To be attested by Gazetted officer.
- g) Copy of latest income tax returns for the assessment year 2016-2017 submitted along with proof of receipt. To be attested by Gazetted officer.

- h) The bidder should produce the copy of G S T registration with commercial tax department along with bid. To be attested by Gazetted officer.
- i) The bidder should produce the Latest GST Clearance Certificate (OR) Latest Monthly Return for GST. To be attested by Gazetted officer.
- j) Availability of key personnel in statement VI.
- k) Information regarding any litigation, with Government during the last five years, in which the Tenderer is involved in (Statement - VII)
- l) The tenderers shall be required to furnish **Checklist and declaration in online** stating that the soft copies uploaded by them are genuine. Any incorrectness / deviations noticed will be viewed seriously and apart from cancelling the work duly forfeiting the EMD, Criminal action will be initiated including suspension of business
- m) The tenders will be opened by the EXECUTIVE ENGINEER- NIRDPR NIRD, Hyderabad or his nominee at his office in the presence of tenderers / or their authorised representatives, on the date mentioned above
- n) The bidder should produce the copy of Service tax registration with along with bid. To be attested by Gazetted officer.
- o) **Experience :**
- i) • Satisfactorily completed as prime contractor in similar nature of Three works of value not less 1.00 crore and Two works of value not less 1.50 crore One work of value not less 2.00 crore in last five financial year and submit a Certificate it has to be issued by Engineer-in-Charge of Government Department / undertaking not below the rank of EXECUTIVE ENGINEER or equivalent and counter signed by the rank of Superintending Engineer or equivalent and attested by Gazetted Officer .Sub Contractors / GPA holders experience shall not be taken in to account
- ii) The firm must have designed ,manufactured , tested, supplied , erected, commissioned minimum plant capacity of **0.5 MW** (Cumulative over the period of last three years) in the range of 10 KW and above and which is / are in successful operation on the date of bid opening . The Copies of PO"s and satisfactory report from pervious installations in support of the same must be attached and has to be attested by Gazetted Officer .Sub

Contractors / GPA holders experience shall not be taken in to account

- iii) The firm must have set up at least one solar power plant of 10KW or above capacity in the premises of reputed Government building like Secretariat, State Assemblies, Raj Bhavans , Rashtrapathi Bhavan, Parliament House, State or central universities and such other government buildings. The copy of brief write-up backed with adequate data , explaining the available capacity and experience (both technical and commercial) for the manufacture and supply of the required system and equipment within the specified time of completion after meeting all their current commitments)
- iv) The bidder should have experience of operation and maintenance of solar power stations cumulative capacity of 500 KW in India (Supported by client"s AMC orders/ performance certificates)
- s) Annual turnover certificate issued by Executive Authority or certified by CA along with Saral form and , Profit & Loss Account in any one financial year during the last five financial years . To be attested by Gazetted Officer
- t) CERTIFICATES IN SUPPORT OF EXISTING COMMITMENTS. To be attested by Gazetted Officer

If any Successful bidder fails to submit the original DD towards EMD within the stipulated time, the tenderer will be suspended/disqualified from participating in the tenders on "e-procurement platform for a period of 3 Years from the date of bid submission. The suspension of tenderer shall be automatically enforced by the e-procurement system." as per the guidelines in vogue GO Ms No 174 I&CAD (PW. Reforms) Department dated 1.09.2008.

No relaxation will be given to any of the qualification criteria.

2.5 Even though the tenderers meet the above qualifying criteria, they are liable to be disqualified / debarred / suspended / blacklisted if they have

- Furnished false / fabricated particulars in the forms, statements and /annexures submitted in proof of the qualification requirements and/or
- Not turned up for entering into agreement, when called upon.

- Record of poor progress such as abandoning the work, not properly completing the contract, inordinate delays in completion, litigation history or financial failures etc. and/or

- Participated in the previous bidding for the same work and had quoted unreasonably high tender percentage and

- Even while execution of the work, if found that the work was awarded to the Contractor based on false / fake certificates of experience, the Contractor will be blacklisted and work will be taken over invoking clause 61 of PS to APSS.

2.6 deleted.

55210/2019/CMU

- 2.7 For tenders up to 25% less than the estimated contract value of work, no additional security deposit is required. But for tenders less than 25% of the estimated Contract Value of work, the difference between the tendered amount and 75% of the estimated contract value, shall be paid by the successful tenderer at the time of concluding agreement as an additional security to fulfil the contract through a Demand Draft in a Nationalized / Scheduled Commercial Bank in the prescribed format valid till completion of the work in all respects
- 2.8 a) If the percentage quoted by a tenderer is found to be either abnormally high or with in the permissible ceiling limits prescribed but under collusion or due to unethical practices adopted at the time of tendering process, such tenders shall be rejected.
- a) A tenderer submitting a Tender which the tender accepting authority considers excessive and or indicative of insufficient knowledge of current prices or definite attempt of profiteering will render him liable to be debarred permanently from tendering or for such period as the tender accepting authority may decide. The tenderer overall percentage should be based on the controlled prices for the materials, if any, fixed by the Government or the reasonable prices permissible for the tenderer to charge a private purchaser under the provisions of clause-6 of the hoarding and profiteering prevention ordinance of 1943 as amended from time to time and on similar principle in regard to labour supervision on the construction.

B. TENDER DOCUMENT**3. Contents of Tender document.**

- 3.1 One set of Tender document, comprises of the following:

Technical bid

- 1) Notice Inviting Tenders (NIT)
- 2) Instruction to Tenderers
- 3) Forms of Tender and qualification information
- 4) Conditions of Contract.
- 5) Specifications.
- 6) Drawings.
- 7) Forms of Securities. i.e., EMD, Additional Security etc.

Part II Price bid

Name of work: **Supply, Installation, Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@NIRDPR Campus, Hyderabad.**

Bill of Quantities and Price bid.
Estimate

Sno	Qty	Description of item	Rate	Unit	Amount
1	1	Supply, installation, testing and commissioning of solar photo-volatic grid interactive roof top power plant including all necessary components, sub-components, spares, tools, tackles etc, on Turn key basis. Including design and preparation/ supply of drawings/ approval. (Cumulative capacity 260 KWP and PCU/MPPT inverter of 260 KVA) system components with the following specifications: Make: Emmvee photo voltaic power pvt. Ltd/ HBL power systems Ltd/ Agni power and Electronics Ltd/ swelect Energysystems Ltd. Tata power solar systems Ltd or equivalent approved by the MNRE.		Each	
		A. TECHNICAL SPECIFICATION: 1. SPV modules for a total OF 260 kwp, each modules not less than 260 WP should be as per bid document specification - 1 Job of required panels Crystalline silicon terrestrial PV modules certification: IEC61215/ISI 14286, in addition to the modules must conform to IEC 61730 part I-requirement for construction and part-2 requirements for safety qualification. PV modules to be used in highly corrosive atmosphere must qualify salt mist cortrosion testing as per IEC 61701.			
		2. SPV module mounting structure suitable for accommodating 260 KWP capacity SPV modules made out of GI section to withstand wind speed of 180 KMPH & hot dip galvanized 70 microns, including foundation as per specifications on roof top of site building as per BIS (Bidder should submit design of foundation along with document)			
		3. Power conditioning unit (PCU), grid interactive in nature, shall consist of MPPT controller, inverter of rating 260 KWP associates control and protection devices etc. All integrated into PCU. It shall provide necessary protections for Grid synchronization and data logging/ monitoring. PCU should be designed to be completely compatible with the SPV array voltage and Grid supply voltage and DG set voltage and as per following and bid document specifications make: Delta/ power on/ Enertech/ Schneider/ ABB/ Emerson or equivalent make approved by MNRE.			
		4. Series Junction Box: One series junction box for each mounting structure with blocking diode & made out polycarbonate material – 1 set as per the requirement of			

	<p>site.</p> <p>5. Array junction boxes made out of polycarbonate material tyco/Hensel/ spelberg – required nos</p> <p>6. Main junction boxes made out of polycarbonate material tyco / Hensel/ spelberg - required nos</p> <p>7. Data logging system with remote monitoring a per specification – 1 set</p> <p>8. DC Distribution units as per specifications Siemens/ Legrand/ABB/Schnieder/ Legrand/ L & T. required nos.</p> <p>9. AC distribution units as per specifications Seimens/ Legard/ABB/Schnieder/ L&T – 1 set or approved by MNRE</p> <p>10. 3 phase 415 volt static energy meter as per specification for measuring the energy output (minus auxiliary consumption) of the solar PV projects and net energy meter/import and ex meter for interfacing with distribution supply, Apex/ MECO .</p> <p>11. Cables requirement as per design Mtrs. As required at site for full plant commissioning finolex/polycab/Havells.</p>			
	<p>12. Earthing complete set as per specification as per BIS complaint.</p> <p>13. Fuses, transfer switches, printers circuit boards requirement for power plant.</p> <p>14. Providing training to Engineers and site staff for operating maintenance and trouble shooting skills.</p> <p>15. Including operation and maintenance of the SPV power plant for a period of 5 years from date of commissioning of the power plant.</p> <p>16. Engineering, electrical drawings and installation and O & M manuals.</p> <p>17. Any other equipment required to complete the installation.</p>			
	<p>B. Environmental specification: Ambient temperature range 0-50 C Ambient humidity range: 80% within temperature range.</p> <p>C. Protection specification:</p> <ul style="list-style-type: none"> - overload conditions: Control system automatic shutdown/ reset for over load exceeding 1.5 times nominal maximum current per phase during 10 secs. - Short circuit protection: Circuit breaker and electronic protection is used. - Low/ High voltage output protection: Automatic/ reset shutdown when 10% nominal voltage exceed. - Power electronics components protection: Protection by electronics means protected against emission of radio frequency noise. - Installation of required lightening arresters of required Capacity 			
	<p>D. Mechanical specification:</p> <ul style="list-style-type: none"> - Cooling: Temperature controlled, fan forced cooling - Enclosure construction: Power coated metal construction - - Mounting requirements: Floor mounting all circuit board are protected against humidity fungus and dust. 			

	<ul style="list-style-type: none"> - DC distribution board: for integrating the outputs of sub-arrays and giving a consolidated output - AC distribution board is a cubical serving as a load connection point to the PCU - Installation kit: installation accessories (Screws etc) for interconnection the system components. -Earthing kit: To divert transient current to an earth grounding system. Supplied with locking pin, PVC tape 50 mm wide length 10 mts, buryl rubber 50 mm wide length 1 meter and S/S hardware M6X50 mm 			
	<p>E. 1.1 This contract shall include servicing & replacement guarantee for parts and components (such as electronics, inverters and PV modules) solar photovoltaic power plants for five years from the date of installation.</p> <p>1.2. This contract shall ensure proper functioning of the system as a whole. All preventive/ routine maintenance and break down/ corrective maintenance required for ensuring maximum uptime shall have to be provided by manufacturer.</p> <p>2. Preventive/ routine maintenance shall be done by the company at least once in a every six months and shall include activities such a cleaning and checking the health of the SPV system, cleaning of module surface, tightening of all electrical connections, changing of module mounting structure, cleaning may be requires proper functioning of the Solar photovoltaic power plant as a whole. The maintenance record shall be maintenance properly and to be submitted to the department on half yearly basis.</p> <p>3. Whenever a break sown/ corrective complaint is lodges by the department, the supplier has to attend the same within a reasonable period of time (7 days) and in any case the breakdown shall have to be corrected within a period not exceeding ten days from the date of complaint.</p>			

Note : The bidder are requested to add additional items as per requirement after inspection of the site and the above items quantities are tentative they may increase/Decrease by 10% . Further Actual Payment Will be released after quality control checkup by third party approved by competent Authority.

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STATEMENT – VI.

Availability of Key Personnel :

Qualification and experience of Key Personnel proposed to be deployed for execution of the Contract.

Sl. No	Name	Designation	Qualification	Total Experience	Working with the Tenderer since.
1	2	3	4	5	6

Signature of the Tenderer

STATEMENT - VII

Information on litigation history in which Tenderer is the Petitioner.

Case No. / Year	Court where filed.	Subject Matter / Prayer in the case.	Respondents i.e., SE / CE	Present Stage.
1	2	3	4	5

Signature of the Tenderer

Contractor

EXECUTIVE ENGINEER- NIRDPR

QUALIFICATION INFORMATION**Annexure – I****CHECKLIST TO ACOMPANY THE TENDER**

1	<p>i. Manufacturers of SPV crystalline module and Yes / No having facilities and capacity and procedures including quality control who must have designed, manufactured and type tested and supplied 1 MW such modules (or)</p> <p>ii. Approved MNRE Channel partner with valid accreditation along with firm Registration(in both cases) issued by Registrar of firms.</p>		
2.	Bidders must submit the organization chart of the Yes / No company clearly showing the details of Technical Personnel, Installation, Commissioning & COM capability, training set up etc,		
3	The bidder shall be an established agency having adequate experience in executing similar grid supported solar power projects in India on turnkey basis in the last Five years. (Evidence supported by Purchase Orders and Project completion certificates).	Yes / No	
4	The bidder should have experience of having set-up at least 0.5 MW solar power plants	Yes / No	
5	<p>The bidder should be a manufacturer of SPV systems OR having an established tie up with a PV system manufacturing company for the past Five years having capacity of manufacturing PV modules not less than 2 MWp (Supported by OEM certificates).</p> <p>The bidder should have experience of operation and maintenance of solar power stations cumulative capacity of 500 KW in India (Supported by client"s AMC orders/ performance certificates).</p>	Yes/No	
6	To furnish copy of PAN card. To be attested by Yes / No Gazetted officer.		
7	Copy of latest income tax returns for the assessment year 2016-2017 submitted along with proof of receipt. To be attested by Gazetted officer		
8	The bidder should produce the copy of GST registration with commercial tax department along with bid. To be attested by Gazetted officer.		

9	The bidder should produce the Latest GST Clearance Certificate (OR) Latest Monthly Return for G S T . To be attested by Gazetted officer.	Yes / No	
10	The bidder should produce the copy of Service Tax registration along with bid. To be attested by Gazetted officer	Yes / No	
11	Availability of key personnel in statement VI.	Yes / No	
12	Litigation history in statement –VII	Yes / No	
13	DD towards EMD.	Yes / No	
14	Declaration towards the genuineness of the certificates	Yes / No	
15	List of Certificates enclosed	Yes / No	
16	Experience :	Yes / No	
i)	The firm must have designed ,manufactured , tested, Supplied, erected, commissioned minimum plant capacity of 0.5 MW (Cumulative over the period of last five years) in the range of 10 KW and above and which is / are in successful operation on the date of bid opening . The Copies of PO"s and satisfactory report from pervious installations in support of the same must be attached and has to be attested by Gazetted Officer .Sub Contractors / GPA holders experience shall not be taken in to account (as per experience prescribed		
ii)	The firm must have set up atleast one solar power plant of 10KW or above capacity in the premises of reputed Government building like Secretariat, State Assemblies, Raj Bhavans , Rashtrapathi Bhavan, Parliament House, State or central universities and such other government buildings. The copy of brief write-up backed with adequate data , explaining the available capacity and experience (both technical and commercial) for the manufacture and supply of the required system and equipment within the specified time of completion after meeting all their current commitments)		
iii)	The bidder should have experience of operation and maintenance of solar power stations cumulative capacity of 500 KW in India (Supported by client"s		

	AMC orders/ performance certificates)		
19)	<p>BID CAPACITY: The tenderer who meets the above Yes / No qualification criteria and whose available bid capacity is more than ECV value will be qualified for opening of price bid. i.e $2AN-B > ECV$</p> <p>Available bid capacity : $2AN-B$ where as</p> <p>“A” = Annual turn over in any one financial year during the last five financial years</p> <p>(updated to current price level) will be considered.</p> <p>“B”= Updated value (at current price level) of all Existing commitments i.,e ongoing works, Works likely to be awarded , works to be executed during the next 12 Months (Period of completion for which the tenders are invited.)</p> <p>“N” = No. of years prescribed for completion of work for which tender are invited.</p> <p>(Period of completion / 12 Months)</p>		
20)	Annual turnover certificate issued by Executive Authority or certified by CA along with Saral form and , Profit & Loss Account in any one financial year during the last five financial years . To be attested by Gazetted Officer	Yes / No	
21)	CERTIFICATES IN SUPPORT OF EXISTING COMMITMENTS. To be attested by Gazetted Officer	Yes / No	

Contactor's signature with seal

EXECUTIVE ENGINEER- NIRDPR

National Institute of Rural Development & Panchayati Raj

1) The description of the work is as follows

- i) Supply, Installation, Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@ NIRDPR Campus, Hyderabad**

Copies of other drawings and documents pertaining to the works will be open for inspection by the tenderers at the office of the above mentioned officer.

Tenderers 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 tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer 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 tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work

2) The competent authority on behalf of does not bind himself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all of the tenders received without the assignment of a reason. All tenders, in which any of the prescribed conditions are not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

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

4) The competent authority on behalf of Director General, NIRDPR reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

5) The contractor shall not be permitted to tender for works in the NIRDPR (responsible for ward and execution of contracts) in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted officer in the National Institute of Rural Development or in the Ministry of Rural Development. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.

6) No Engineer of Gazetted rank or other Gazetteer officer employed in Engineering or Administrative duties in an Engineering Department of the is allowed to work as a contractor for a period of two years after his retirement from Government service, without the previous permission of the in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the

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permission of the as aforesaid before submission of the tender or engagement in the contractors service.

7) The tender for the works shall remain open for acceptance for a period of sixty days from the date of opening of tenders. If any tenderer withdraws his tender before the said period or issue of letter of acceptance whichever is earlier or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid.

This Notice Inviting Tender shall form a part of the contract document. The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall, within 60 days from the stipulated date of start of the work sign the contract consisting of: -

- a) The notice inviting tender, all the documents including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
- b) Standard C.P.W.D. Form – 8

9 For composite tenders

1. The tenderer must associate with himself agencies of the appropriate class eligible to tender for the other components individually.

It will be obligatory on the part of the tenderer to sign the tender document for all the components (The schedule of quantities, conditions and special conditions etc.)

After the work is awarded, the contractor will have to enter into separate agreement for each component with the officer concerned.

The EXECUTIVE ENGINEER in charge of the major component will call tenders for the composite work. The cost of tender document and earnest money will be fixed with respect to the combined estimated cost put to tender for the composite tender. Security deposit will be worked out separately for each component corresponding to the estimated cost put to tender for the composite tender. The earnest money will become part of the security deposit of the major component of work.

On acceptance of the composite tender by the competent authority, the letter of award will be issued by the EXECUTIVE ENGINEER- NIRDPR-in-charge of the major component on behalf of the DG, NIRDPR, making it clear in the letter of award that the contractor will have to execute separate agreements for different components of work with the concerned officers of the respective discipline (Designation to be given).

Contractor

EXECUTIVE ENGINEER- NIRDPR

General rules and directions:

1. All work proposed for execution by contract will be notified in a form of invitation to tender pasted in public places and signed by the officer inviting tender or by publication in News papers as the case may be.

This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer, inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorising him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.
3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.
4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation of tender, or in the time allowed for carrying out the work, or which contain any other condition of any sort including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes.
The rate[s] must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paise and considering more than fifty paise as rupee one.
5. The officer inviting tender or his duly authorized assistant, will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money forwarded therewith shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-1. In the event of a tender being rejected, the earnest money forwarded with such unaccepted tender shall thereupon be returned to the contractor remitting the same, without any interest.
6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement or payment to the officer inviting tender and the contractors shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorised Cashier.
8. The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer-

inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.

9. The tenderers shall sign a declaration under the officials Secret Act, 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.
10. In the case of item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount.
11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation such a tender is liable to be disqualified and rejected.
12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word "Rs" should be written before the figure of rupees and word "P" after the decimal figures, e.g. "Rs.2.20P" and in case of words, the word, "Rupees" should precede and the word "Paise" should be written at the end. Unless the rate is in whole rupees and followed by the word "only" it should invariable be up to two decimal places. While quoting the rate in schedule of quantities, the work "only" should be written closely following the amount and it should not be written in the next line.
13. The contractor shall submit an irrevocable performance guarantee of 5% (five percent) of the tendered amount in addition to the other deposits mentioned elsewhere in the contract for proper performance of the agreement (not withstanding and / or without prejudice to any other provisions in the contract) within 60 days of issue of letter of intent. This guarantee shall be in the form of government securities or fixed deposit receipts or guarantee bonds of any scheduled bank or the state bank of India, in accordance with the form annexed hereto.
14. The contractor whose tender is accepted, will be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 5 % of the tendered value of the work. The Security deposit will be collected by deductions from the running bills of the contractor at 10% of the gross amount of each running bill till the sum along with sum already deposited as earnest money will amount to security deposit equal to 5% of the tendered value of the work [Bank Guarantee, is not to be accepted as Security deposit.]
15. On acceptance of the tender, the name of the accredited representative[s] of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge

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16. Sales-tax, purchase tax, turnover tax or any other tax on material in respect of this contract shall be payable by the contractor and Government will not entertain any claim whatsoever in respect of the same.
17. The contractor shall give a list of both gazetted and non-gazetted C.P.W.D.&NIRDPR employees related to him.
18. The tender for the work shall not be witnessed by a contractor or contractors who himself/themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
19. The tender for composite work includes in addition to building work all other works such as sanitary and water supply installations drainage installation, electrical work, horticulture work, roads and paths etc. The tenderer apart from being a registered contractor [B & R] of appropriate class, must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage, electrical and horticulture works in the composite tender.
20. The contractor shall submit list of works, which are in hand [progress] in the following form :-

Name of work	Name & particulars of Division where work is being executed	Value of work	Position of works in progress	Remarks
1	2	3	4	5

21. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Superintending Engineer/EXECUTIVE ENGINEER-NIRDPR may in his discretion without prejudice to any other right for remedy available in law cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

Contractor**EXECUTIVE ENGINEER- NIRDPR**

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**CPWD –
8.**

**National Institute of Rural Development
&Panchayati Raj**

State:Telangana

Division: **EXECUTIVE ENGINEER** CMU, NIRDPR

**Item Rate Tender & Contract for the
work**

Tender for the work of: **Supply, Installation, Testing, Commissioning of 260Kwp grid
interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings
with Net metering facility@ NIRDPR Campus, Hyderabad**

To be submitted by **3.00 PM.** on **11/11/2019** to **EXECUTIVE ENGINEER CMU** - NIRDPR,
Hyderabad.

i) To be opened in presence of tenderers who may be present at **3.30 PM** on
date 13/11/2019 in the office of the **EXECUTIVE ENGINEER CMU** - NIRDPR,Hyd.

Issued to _____(Contractor)

**Signature of the issuing
authority**

**EXECUTIVE ENGINEER- NIRDPR
Hyderabad.**

Date of issue:

Contractor

EXECUTIVE ENGINEER- NIRDPR

T E N D E R

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

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

We agree to keep the tender open for Ninety (90) days from the due date of submission thereof and not to make any modifications in its terms and conditions.

A sum of **Rs. 5.00 lakhs /-** demand draft of a scheduled bank as earnest money. If I / we fail to furnish the prescribed performance guarantee within prescribed period, I/we agree that the said Director General , NIRDPR or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further if I/ we fail commence work as specified, I/we agree that the Director General , NIRDPR or his successor in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule „F“ and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

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

Dated:

Signature of Contractor

Postal Address

Witness:

Address:

Occupation:

Contractor

EXECUTIVE ENGINEER- NIRDPR

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Director General, NIRDPR for a sum of Rs.

_____ (Rupees _____)

The letters referred to below shall form part of this contract Agreement: -

i)

ii)

For & on behalf of DG, NIRDPR.

Signature

Designation.....

Dated

Reference to General Conditions of contract.

Name of work: Supply, Installation , Testing, Commissioning of 260 Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top with Net metering facility of NIRD&PR Buildings ,Hyderabad

Estimated cost of work:	Rs.1.38 crore.
Earnest money:	Rs.5.00 lakhs
Performance guarantee: -	5% of tendered value
Security Deposit:	5% of tendered value.

General Rules and Directions:

Officer inviting tender:

EXECUTIVE ENGINEER NIRDPR, Hyderabad.

Definitions:

2 (v)	Engineer-in-Charge	EXECUTIVE ENGINEER- NIRDPR , Hyderabad.
2 (viii)	Accepting Authority	Technical Committee NIRD&PR, Hyderabad
2 (x)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(xi)	Standard Schedule of Rates:	Delhi Schedule of Rates with up to date Correction slips and other

		markets rates.
2 (xii)	Department:	National Institute of Rural Development & Panchayati Raj
9 (ii)	Standard CPWD contract Form:	CPWD form 8 (2005) as notified & corrected up to January, 2008
Clause 1	i) Time allowed for submission of performance guarantee from the date of issue of letter of acceptance, in days	7 days
	ii) Maximum allowable extension beyond the period in i) above, in days	7 Days
Clause 2	(i) Authority for fixing Compensation under clause 2	Technical Committee NIRD&PR, Hyderabad.
Clause 2 A	Whether the clause 2 A shall be applicable	No
Clause 5	No of days from the date of issue of tender acceptance for reckoning the date of start.	10 Days
(ii) Mile stone(s)	As per the table given below.	

Conditions for Cement :

- The contractor shall procure 43 grade (confirming to IS8112) ordinary Portland cement as required in the work from reputed manufacturers of cement having production capacity of one million tone per annum or more such as ACC, L&T, J.P.Rowa, Vikram Shree cement, Birla jute and Cement Corporation India etc, i.e agencies approved by the ministry of Industry, and holding license to use ISI certification mark for their product. The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacture(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially. Supply of cement shall be taken 50 Kg bags bearing manufacturers name and IS marking Samples of cement arranged by the contractor shall be taken by the Engineer – in Charge and got tested in accordance with provisions of relevant BIS Codes. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS Code, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week"s time of written order from the Engineer-in-Charge, to do so.
- The cement shall be brought at site in bulk supply of approximately 10 tones or as decided by the Engineer in Charge.

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- 3 The cement godown of the capacity to store in a minimum of 600 bags of cement shall be constructed by the contractor at site of work for which no extra payment shall be made. Double lock provision shall be made, to the door of cement godown. The keys of one lock shall remain with the Engineer-in Charge or his authorized representative and the key of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of cement godown. The contractor shall facilitate the inspection of the cement go down by the Engineer-in-Charge at any time.
- 4 The contractor shall supply free of charge the cement required for testing. The cost of test will be borne by the contractor/Department in the manner indicated below.
 - (i) By the contractor if the result shows that the cement does not conform to relevant BIS code.
 - (ii) By the Department if the results show that the cement confirms to relevant BIS Code.
- 5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid there in.
- 6 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-Charge.

Conditions for Steel:

1. The contractor shall procure steel reinforcement bars conforming to relevant BIS codes from main producers such as VSP SAIL TATA as approved by the Ministry of Steel. The contractor shall have to obtain and furnish test certificates to the Engineer-in-Charge in respect of all supplies of steel brought by him to the site of work. Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to BIS codes, the same shall stand rejected and shall be removed from the site of work by the contractor at his cost within a week's time from written orders from the Engineer-in-Charge
- 2 The steel reinforcement shall be brought to the site in bulk supply of 10 tones or more or as decided by the Engineer-in-Charge.
- 3 The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent distortion & corrosion and nothing extra shall be paid on this account. Bars of different sizes and length shall be stored separately to facilitate easy counting and checking.
- 4 For checking nominal mass tensile strength bend test, re bend test etc., specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than specified below.

Size of bar	For consignment below 100 tones.	For consignment over 100 tones.
Under 10mm dia	One sample for each 25 tones or Part thereof.	one sample for each 40 tones or Part thereof
10 to 16 mm dia	One sample for each 35 tones or Part thereof.	one sample for each 45tonnes or Part thereof.
Over 16mm dia	One sample for each 45 tones or Part thereof.	one sample for each 50 tones or Part thereof.

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- 5 The contractor shall supply free of charge the steel required for testing. The cost of tests shall be borne by the contractor/Department in the manner indicated below:
By the contractor, if the results show that the steel does not conform to relevant BIS codes.
By the Department, if the results show that the steel conforms to relevant BIS codes.
- 6 The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein.
- 7 Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.

SPECIAL CONDITIONS:

1. Unless otherwise provided in the Schedule of Quantities of CPWD Specifications the rates tendered by the Contractor shall be inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account.
2. The contractors shall make their own arrangements for obtaining electric connections if required and make necessary payments directly to the department concerned.
3. Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall leave such necessary holes, openings etc., for laying/burying in the work pipes, cables, conduits, clamps, boxes, and hooks for fan clamps etc., as may be required for other agencies. Conduits for electrical wiring/cables will be laid in a way that they leave enough space for concreting and do not adversely affect the structural members. Nothing extra over the agreements rates shall be paid for the same.
4. Some restrictions may be imposed by the security staff etc., on the working and for movement of labour, materials etc., the contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on this account.
 - a) The work shall be carried out in a manner complying in all respects with the requirements of relevant by laws of the local body under the jurisdiction of which the work is to be executed and/or as directed by the Engineer –in-Charge. And nothing extra will be paid on this account.
 - b) If as per municipal rules the huts for labour are not to be erected at the site of work by the contractors. The contractors are required to provide such accommodation as is acceptable to local bodies and nothing extra shall be paid on this account.
 - c) The contractor shall comply with proper legal orders and directions of local or public authority or municipality and abide by their rules and regulations and pay all fees and charges, which he may be liable to pay
5. Mines & Quarries recovery of seignior-age charges from the bills of the contractors royalty at the prevalent rates shall be deducted from the bills of the contractor on the material (where royalty is payable on materials like boulders, sand etc.) as per Govt of A.P. G.O. No. 217 dated 29/09/2004 (Copy enclosed) if the contractor fails to produce the documentary evidence having paid the seignior-age charges to the government. The quoted rate of the contractor shall be inclusive of all such royalty and taxes etc. and nothing extra shall be payable on this account.
- 6) The Contractor will have to work according to the program for work approved by the Engineer-in-Charge. The contractor shall construct a sample unit wherever applicable complete in all respect within time specified by the Engineer-in-Charge.7) The contractor shall take instructions from the Engineer-in-Charge for stacking of material in any place. 32

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No excavated earth or building material shall be stacked on areas where other buildings roads, services or compound walls are to be constructed.

- 8) Cement go down shall be provided with a single door with two locks. The keys of one locks shall remain with Engineer-in-Charge of work or his authorized representative and that of the other lock with the authorized agent of the contractor at the site of work so that the cement is removed from the go down according to the daily requirement with the knowledge of both the parties and proper account maintained in standard proforma.
- 9) The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are under double lock system.
- 10) The contractor shall construct suitable godowns yards at the site of work for storing all other materials so as to be safe against damage by sun, rain, fire, theft etc., at his own cost and also employ necessary watch and ward establishments for the purpose at his cost.
- 11) The steel doors windows, ventilators and composite units shall be got fabricated in works shop duly approved by the Engineer-in-Charge.\
- 12) The proof of execution certificate should be signed/countersigned by an officer not below the rank of **EXECUTIVE ENGINEER- NIRDPR**. The tender should be able to arrange steel centering and shuttering with steel propping for an area of up to 800 Sqm at a time for concrete work.
- 13) The contractor has to submit bar chart for the execution of the work duly signed by the contractor so as to complete the work stipulated time period.
- 14) Intending tenderers are advised to visit the site and get acquainted with site conditions before tendering.
- 15) Any delay / failure on the part of the tenderer to arrange for men and materials at required time shall not be considered as valid hindrance.
- 17) The contractor has to furnish monthly progress report indicating both physical and financial status of the work.
- 18) Water charges: Clause 31 A of P W D - 8 for unfiltered water supply is not applicable since the contractor has to arrange water for construction purposes and this water shall be tested from a recognized laboratory periodically as directed by the Engineer-in Charge. Testing charges will be borne by the contractor.
- 19) The contractor shall supply free of charge the steel required for testing. The cost of test shall be borne by the contractor /Department in the manner indicated below:
 - (i) By the contractor if the results show that the steel does not conform to relevant BIS codes.
 - (ii) By the Department if the results show that the steel conforms to relevant BIS codes
- 20) The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein.
- 21) Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.
- 22) The contractor shall furnish to the Department all the purchase invoices both for cement and steel for every consignment.
- 23) Weight being calculated with the help of table-IV in Para 5.3.3. Of CPWD specifications 1996 however for bars M S /cold twisted up to and including 10 mm the following procedure shall be adopted. The average sectional weight for each diameter shall be arrived at from samples for each lot of steel received at site. The actual weight of steel

issued shall be modified to take into account the variation between the actual and the standard co-efficient given in table IV and the contractors accounts will be debited by the cost modified quantity only. The decision to be followed for determining the average sectional weight of each lot Quantity of each diameter of steel received at site of work each lot. Quantity of each diameter of steel received at site if work each day will constitute one single lot for this purpose.

- 24) All materials obtained from Government stores or otherwise shall be got checked by the Junior Engineer in-Charge of the works on receipt of the same at site before use.
- 25) The contractor should also dismantle the entire structure along with the foundations of the existing buildings and refill with earth in the dismantled foundations wherever necessary. The contractor should not use any serviceable /unserviceable materials obtained from the dismantlement in the construction of new buildings.
- 26) The contractor should use factory made round type cover blocks for all R C C works to avoid displacement of bars in any directions and to ensure proper cover.
- 27) Sometimes it shall not be possible to pay monthly bills on account of non-availability of LOC/Budget/Deposit. No claim shall be entertained for slow progress stoppage of work on this account.
- 28) Materials having BIS marking shall be used on work. In case any materials where the BIS marking is not available such materials should be got from the firms approved by the Chief Engineer (SZ) II Where no such approval exists then the shall be got approved from the Engineer in charge. The materials procured without such approval will not be allowed for use in the work.
- 29) All aluminum extruded doors and windows shall be manufactured from standard extruded aluminium section manufactured by JINDAL INDAL or the firms approved by CE SZII.
- 30) Terrazzo tiles to be used shall be got from firm as approved by the CE SZII.
- 31) Before use in work samples of granite and marble slabs, shade of laminated particleboards and samples of manufactured items/fittings have to be got approved from the Engineer in charge.
- 32) Steel windows shall be manufactured in the workshop duly approved by CE SZ II from standard sections having BIS marking from approved manufacturers like Sen Harvicks/Metal Window Corporation/Madhu Industries or from the firms approved by the P&H,CIAT/PD,RTP - NIRDPR., Rajendranagar, Hyderabad.

Form Of Performance Security Bank Guarantee Bond

In consideration of the Director General ,NIRD(hereinafter called "The Government") having agreed under the terms and conditions of agreement No._____Dated._____made between

_____ and _____
(hereinafter called "the said contractor(s)") for the work

_____ (herein after called "the said Agreement") having agreed to production of a irrevocable Bank Guarantee for Rs._____(Rupees_ _____

_____ only) as security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement,

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We, _____ hereinafter referred to as "the Bank")

(Indicate the name of the Bank)

hereby undertake to pay to the Government an amount not exceeding Rs. _____
(Rupees _____ Only) on
demand by the Government.

2. We _____ do hereby undertake to pay the
amounts

(Indicate the name of the Bank)

due and payable under this Guarantee without any demure, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only).

3. We, the said Bank further undertake to pay to the Government any money so demanded notwithstanding my dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

4. We _____ further agree that the
guarantee herein

(Indicate the name of the Bank)

contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-charge on behalf of the government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor(s) and accordingly discharges this guarantee.

We _____ further agree with the Government (Indicate the name of the Bank) that the Government shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to for-bear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

6. We _____ lastly undertake not to
revoke this (Indicate the name of the Bank) guarantee except with the previous consent of the Government in writing.

8. This guarantee shall be valid up to _____ unless extended on demand by Government. Notwithstanding any mentioned above, our liability against this guarantee is

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restricted _____ to
Rs. _____ (Rupees _____
only) and unless a claim in writing is lodged with us within six months of the date of expiry or
the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand
discharged.

Dated the _____ day of _____
for _____ (Indicate the name of the Bank)

Contractor

EXECUTIVE ENGINEER- NIRDPR

SCOPE OF WORK**SCOPE OF WORK:-**

Name of work: “Supply, Installation , Testing, Commissioning of 260Kwp grid interactive Solar Photovoltaic Power Plant System on the Roof Top of NIRD&PR Buildings with Net metering facility@NIRDPR Campus,Hyderabad”.

SCOPE OF SUPPLY & WORK:

- 1 Scope of Supply & Work includes all, design, engineering, manufacture, procurement & supply of equipment, and materials, testing at manufacturers works, inspection, packing and forwarding, supply, unloading at site, associated civil works, services, permits, installation and incidentals, insurance at all stages, erection, testing and commissioning of 260 kwp (+/- 5% Grid Interactive Solar PV Power Plant with associated equipments and materials on turnkey basis at roof top of NIRD&PR with its Comprehensive annual Maintenance for 5 years.
2. The equipment and materials for 260 kwp (+/-5%)Grid Interactive Solar PV Power Plant with associated system (Typical) shall include but not be limited to the Supply, Erection, and Testing & Commissioning of the following:
 - Solar PV modules in array including mounting frames, structures, foundation bolts and nuts for holding structures and module inter connection.
 - Array Junction boxes, distribution boxes and fuse boxes. MCBs, Surge Arrestors
 - Power Conditioning Units (PCU) with SCADA, & Weather Monitoring system to check Solar Irradiation, Wind Speed & Ambient Temperature.
 - LT Power Interfacing Panel, Plant Monitoring Desk, D C Distribution board.
 - Digital Voltage Meter and Ammeter, Kwh meters. Metering instrument and protection relays along with battery system.
 - LT Power and Control Cables including end terminations and other required accessories for both AC & DC power.
 - Data acquisition system with remote monitoring facilities.
 - Lighting arrestors.
 - PVC pipes and accessories/trenches.
 - Tool kit and Earthing kit.
 - Metering set and protection /Isolation systems,
 - Earthing system for PV Array, DC power system, Lightning protection system
 - Security equipment such as IP night vision CCTV cameras, IR motion sensors etc.
 - Fire extinguishers , danger plates , name boards etc
 - Trivector Meter (Metering Cubicle) with Main & Check Meter
 - Transportation of equipments from Works to Site.
 - Unloading, Loading of all supplied Equipments on Foundations at their respective places.
 - Training of executive/technician.
 - Control room equipments related to solar system etc
 - Testing, maintenance and condition monitoring equipments.
 - Mandatory spares & spares for 2 years
 - Any other equipment / material required to complete the 260 kwp Solar Power Plant on turnkey Basis. .

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- Receipt, unloading, storage, erection, testing and commissioning of all supplied material.
3. Design of 260 kwp Grid Interactive Solar Power Plant and its associated electrical & mechanical auxiliary systems includes preparation of single line diagrams and installation drawings, electrical lay outs, erection key diagrams, electrical and physical clearance diagrams, design calculations for Earth- mat, Bus Bar & Spacers indoor and outdoor lighting/illumination etc. design memorandum and other relevant drawings and documents required for engineering of all facilities within the fencing to be provided under this contract, are covered under Bidders scope of work.
 4. In addition to above, the Bidder is required to measure the Solar Radiation and other climatic conditions. The major categories of site-specific assessment required are:
 - Global Solar Radiation (§GSR")
 - Diffuse Solar Radiation (§DSR)
 - Sunshine Duration
 - Atmospheric Turbidity
 - Temperature & Humidity
 - Wind Speed
 5. Civil foundation work of for AC Distribution Board, DC distribution Board switchgears.
 6. Erection Work shall be performed with respect to the following but not limited to:
 - Solar PV Array.
 - Power Cables
 - Entire GI cable tray
 - Fabrication, supply & erection of cable trays, support, brackets and accessories in case of site fabrication cable tray.
 - Galvanized steel rigid/flexible conduits and accessories, Hume pipes, ferrules, lugs, glands, terminal blocks, galvanized sheet steel junction boxes, cable fixing clamps, nuts and bolts etc. as required.
 - Supply of necessary steel materials for field fabrication of cable trays, supports, brackets, grounding system etc.
 7. Pre-commissioning & Commissioning of all supplied Equipments. Test running of Grid Connect Solar Power Plant as well as load trials at site, prior to handover and implementation of maintenance contract.
 8. Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the solar power plant are deemed to be included in the scope of the specification unless specifically excluded on turnkey basis.
 9. Obtaining statutory approvals / clearances from Government Department/CEIG.
 10. The Bidder shall arrange deployment of manpower and required consumable during commissioning.
 11. Total Maintenance of Solar Photovoltaic Power Plant for the 5 years period.

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12. All equipment & item which are not specifically mentioned but are required for completion of work including commissioning & maintenance of Solar Photovoltaic Power Plant , in every respect and for safe and efficient operation and guaranteed performance without any extra cost.
13. Submission of following documents drawings data design and engineering information to the department for review and approval in five copies.
 - (i) Detailed technical specification of all the equipments.
 - (ii) Design criteria.
 - (iii) Design calculations.
 - (iv) General arrangement an assembly drawings.
 - (v) Contour plan for the area.
 - (vi) Solar Insolation 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 Instructions manuals and its drawings.
14. All drawings shall be fully corrected to agree with the actual "as built" site conditions and submitted to department after commissioning of the project for record purpose.
15. The contractor shall forward to the department
 - (i) Schedule for various activities in the form of PERT Chart within a week from the date of detailed work order.
 - (ii) Fortnightly site work progress report during construction period and
 - (iii) Monthly Maintenance reports after commissioning of the project.
16. Preparation and supply of detailed Operation, System and Maintenance manual of Power Plant.
17. Establishing a system to maintain an inventory of spare parts and tools, equipment, consumables and supplies for the facilities and operation.
18. Employ and coordinate the training of personnel who will be qualified and experienced to operate and monitor the facility and to coordinate operations of the facility with the grid system.
19. Adequate insurance coverage during EPC.

Contractor**EXECUTIVE ENGINEER- NIRDPR**

SCOPE OF COMPREHENSIVE ANNUAL MAINTENANCE WORK

1. The total maintenance of the 260 kwp Solar Photovoltaic Power Plant to the contractor on turnkey basis for the 5 (five) years.
2. The Turnkey contractor shall be responsible for all the required activities for the successful running, optimum energy generation & maintenance of the Solar Photovoltaic Power Plant covering:
 - a. Deployment of Engineering and supporting personnel and regulation of their Duties.
 - b. Successful running of Solar Power Plant for optimum energy generation.
 - c. Monitoring controlling, troubleshooting maintaining of records, registers.
 - d. Supply of all spares, consumables and fixing / application, replacement of damaged modules, invertors/PCU,s etc. required for a period of 5(five) years.
 - e. Supply & use of consumables throughout the maintenance period as per recommendations of the equipment manufacturers.
 - f. Conducting periodical checking, testing, over hauling and preventive action.
 - g. Regular general upkeeping including cleaning of all equipment.
 - h. Submission of periodical reports to department on the energy generation & operating conditions of the solar plant.
 - i. Taking care of the full security aspects of the Solar Power Plant.
 - j. Replacement of defective Modules., if required.
 - k. Replacement of defective Invertors/PCU.s, if required.
 - l. Insurance covering all risk (Fire & allied perils, earth quake, terrorists, and burglary).
3. Continuous monitoring the performance of the Solar Power Plant and regular maintenance of the whole system including Modules, PCU.s, junction boxes underground cables, outdoor/indoor Distribution Board and all associated equipment etc. necessary for extracting and maintaining the maximum energy output from the Solar Power Plant.
4. Maintenance of the Solar Photovoltaic Power Plant is required for a period of 5(five) years from the date of commissioning of the project which shall be carried out at fixed cost. The period of Maintenance will be deemed to commence from the date of commissioning of solar Photovoltaic Power Plant. For the purpose of maintenance payment, the first year shall be reckoned from the date of commissioning of plant for maintenance purpose till 31st March of that financial year. In subsequent years the payment shall be made for the period from 1st April to 31st March of the financial year. In the last year the payment shall be made for the period from 1st April to the date of expiry of the maintenance period.
- 5) 5.1 The contractor shall carry out the periodical/plant maintenance as given in the manufacturers service manual and perform at least minimum requirement.

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- 52 Regular periodic checks of the Modules, PCU.s shall be carried out as a part of routine preventive maintenance.
- 53 In order to meet the maintenance requirements stock of consumables are to be maintained as well as various spare as recommended by the manufacturer at least for 2 years to be kept for usage.
- 54 Particular care shall be taken for outdoor equipment to prevent corrosion. Cleaning of the junction boxes, cable joints, insulators etc shall also be carried out at every month interval.
- 55 Resistance of the earthing system as well as individual earthing is to be measured and recorded every month. If the earth resistance is more than 3 ohm, suitable action is to be taken to bring down the same.
- 56 According to the recommendations stock of special tools and tackles shall be maintained for Modules, PCU.s and other major electrical equipment.
- 57 A maintenance record is to be maintained by the contractor to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown etc.
- 58 The Schedules will be drawn such that some of the jobs other than breakdown, which may require comparatively long stoppage of the Power Plant, shall be carried out preferably during the non sun period.
- 59 The Contractor shall deploy enough manpower at Solar Photovoltaic Power Plant site to carryout work instructions and preventive maintenance schedules as specified. The contractor shall keep at least one skilled and experienced Engineer, one ITI electrician, at least two persons to clean modules and other equipment at site to supervise and up keeping , Maintenance jobs that are being carried out at plant.
- 5.10 The Contractor will attend to any breakdown jobs immediately for repair/replacement /adjustments and complete at the earliest working round the clock. During breakdowns (not attributable to normal wear and tear) at Maintenance period, the Contractor shall immediately report the accidents, if any, to the Engineer In Charge showing the circumstances under which it happened and the extent of damage and or injury caused.
- 5.11 The Contractor shall comply with the provision of all relevant acts of Central or State Governments including payment of Wages Act 1936, Minimum Wages Act 1948, Employer's Liability Act 1938, Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Maturity Benefit Act 1961, Mines Act 1952, Employees State Insurance Act 1948, Contract Labor (Regulations & Abolishment) Act 1970, Electricity Act 2003, Grid Code, Metering Code, MNRE guide lines or any modification thereof or any other law relating whereto and rules made there under from time to time.
- 5.12 The contractor shall at his own expense provide all amenities to his workmen as per applicable laws and rules.

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- 5.13 The Contractor shall ensure that all safety measures are taken at the site to avoid accidents to his workmen.
- 5.14 If negligence / mall operation of the contractor's operator results in failure of equipment such equipment should be repaired replaced by contractor at free of cost.
- 5.15 If any jobs covered in main Scope are not carried out by the contractor during the maintenance period pro-rata deduction will be made based on the quantum of work from the maintenance contract bills.

6. QUALITY SPARES & CONSUMABLES

In order to ensure longevity & safety of the core equipment and optimum performance of the system the contractor should use only genuine spares of high quality standards.

7. TOOLS AND TACKLES

The Contractor shall arrange for all the necessary tools and tackles for carrying out all the maintenance work covered under this contract. List of such tools and tackles has to be furnished by the bidder

8. Procurement for spares parts, overhaul parts, tools, equipments, consumables, etc. required to operate and maintain the project in accordance with the prudent utility practices and having regarded to warranty recommendations.
9. Hand over the system to maintain an inventory of spare parts, tools, equipment, consumables and supplies for the facilities operation along-with required inventory to maintain the facility for two year on the basis of average requirement at the time of conclusion of maintenance period.

SYSTEM PHILOSOPHY & TECHNICAL SPECIFICATION**A. SYSTEM PHILOSOPHY****1) SOLAR SYSTEM AND COORDINATION WITH EXISTING SYSTEM**

- 1.1 The SPV array generally consisting of number of SPV modules that directly produces DC electricity power on receipt of solar irradiation. **This DC power is converted to AC power by PCUs.** The AC output of 260kw solar plant at 230V/415 V level will work in combination with Discom feed existing LT System of NIRD&PR which is of capacity 200-260 kW. These modules usually are made up of SPV cells, forming the basic building block of a solar array. Modules may be connected in series or parallel to increase the voltage and current, and thus achieve the required solar array characteristics that will match the load.
- 1.2 The bidder shall design the system in such a way that System controller of PSU should have ability to harvest the maximum possible Solar Power generation to be utilized for energy requirement of NIRD&PR. During holidays/Sunday/Saturday when the consumption may be low in office, the part of generated energy will be fed to Discom L T Grid.

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1.3 The bidder shall incorporate in their scope LT panel system which will incorporate control system of Discom supply and D G Set along with any modification/ redistribution required in the electrical distribution system of NIRD&PR

2 The main objective is the high availability and reliability of the plant. In order to achieve the main objective, the following principles shall be adopted while designing system.

a) Technology: Solar PV Mono / Poly crystalline cells of high efficiency and the modules should be manufactured in India so as to meet MNRE Guidelines. To avail subsidy for solar plant from MNRE as such bidder should use the modules and other material which is eligible for such subsidy.

b) The Stabilized output of solar Power plant shall be 260 kwp (+ 5%) after one year (measured at standard test conditions of solar radiation as per standards).

- The bidder shall demonstrate the capacity of plant after one year from date of commissioning of plant.
- The bidder shall use adequate capacity of SPV module, PCUs, Junction boxes etc to ensure generation of power as per design estimates. This is to be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of PCUs, transformers, etc
- The output at Invertors (s) will be considered for verification purpose. Bidder should indicate procedure and details of software or formula for demonstration of capacity of plant For other purpose the meter reading will be considered

c) Use of equipment and systems with proven design and performance that have a high availability track record under similar service conditions.

d) Selection of the equipment and adoption of a plant layout to ensure ease of maintenance.

e) Strict compliance with the approved and proven quality assurance norms and procedures during the different phases of the project.

f) Proper monitoring in the synchronizations which ensures the availability of power to the grid. Generation voltage of 230/415V has to fed to grid voltage at the point of interconnection.

g) The injection of DC power in to Grid shall be avoided by using suitable isolation transformer etc at output of inverter.

h) Ripple content must not exceed 3% on DC side

i) Limits for harmonics as per CEA technical standard on Grid connectivity are as follows
 : Total voltage harmonics distortion not more than 5%
 Individual voltage harmonics distortion not more than 3 %
 Total current harmonics distortion not more than 8%

- j) The power plant has to operate in parallel with the grid system which is infinite electrical system. Any faults not taken care will result in damage of only SPV power plant without effecting DISCOMS infinite system. Thus the Solar Power Plant has to protect its equipment against any of possible fault or other disturbances from the grid.
- k) Very fast microprocessor based Directional and Reverse power flow protection should be provided to insure isolation of the solar power plant from the grid at the time of any fault or/and any additional suitable protection.
3. The basic and detailed engineering of the plant will aim at achieving high standards of operational performance especially considering following:
- a. Optimum availability of modules during the day time
 - b. Ensuring module layout to prevent shading.
 - c. Selection of PCUs with high track record and readily availability of requisite spares.
 - d. Careful logging of operation data / historical information from the Data Monitoring Systems, and periodically processing it to determine abnormal or slowly deteriorating conditions.
 - e. SPV power plant should be designed to operate satisfactorily in parallel with the Discom Grid and/ or D G Set within permissible limits of high voltage and frequency fluctuation conditions, so as to export the maximum possible units to the grid.
 - f. Flat plate arrays are held fixed at a tilted angle and face towards the equator, are most common. The angle of tilt should be approximately equal to the angle of latitude for the site. A steeper angle increases the output in winter; while a shallower angle more output in summer. It should be arranged in such a manner that optimize generation is achieved.
 - g. Based on the Solar Insolation data, the solar PV system should be so designed that it shall take into account the mean energy output after allowing for various losses, temperature corrections, on an average day for each month of the year.
 - h. Bidder should use the modules and other material which are eligible as per MNRE norms/guidelines.
 - i. The offered Grid Connected Solar Power Plant should be able to generate power through solar energy and supply clean and green electricity to the grid.
- 4 The specification provided with this bid document is a functional one; the design provided in this document is only meant as an example. The Bidder/ must submit a proposal based upon their own design. In order to win the Contract the Bidder/ must optimize their own design for Solar Photovoltaic (SPV) proven technology so that it best meets the evaluation criteria given in this bid document. The bidders are advised to visit the site before designing the plant and offer their bid. The bidders are also required to incorporate all the system

required for efficient operation of 260 kw solar Plant in parallel with Discom supply and D G set.

- 5 The supplier/manufacturer shall submit the detail design of the complete solar generating system by using their software to optimize the combination of modules considering the specific location, isolation, nature of load etc.

B. TECHNICAL SPECIFICATION:-

6. EQUIPMENT AND MATERIAL

The equipment and material for 260Kwp (+5) Solar Photovoltaic Power Plant with associate system (typical) shall include following but not be limited to the following: (Only The technical features of major equipment's are described here under).

7 SPV Modules:

- 7.1. SPV Poly / Mono crystalline modules (Manufactured in India as Per MNRE Guide Lines) to be supplied should have minimum declared output of 260 Watt peak or more. Number of modules to be supplied shall be worked out accordingly.
- 7.2. Stabilized output of the Solar Power Plant should not be less than 260 kwp under Standard Test Condition after one year of operation from date of Commissioning of solar plant.
- 7.3. 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.
- 7.4. Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture & provide high voltage electrical insulation.
- 7.5. 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.
- 7.6. Solar modules offered shall be certified as per IEC 61215 and qualify IEC 61730 and IEC61701 amended up to date or equivalent Standard.
- 7.7. SPV module shall contain mono/poly crystalline high power silicon solar cells. The solar cell shall have surface anti-reflective coating to help to absorb more light in all weather conditions.
- 7.8. Solar PV module array shall consist of high efficiency Solar Modules utilizing mono/Poly Crystalline Silicon Solar PV cells. Power output Guarantee offered for the SPV Module shall not be less than 25 years. Individual Solar Module rating shall not be less than 260 W at Standard test conditions. Bigger watt size Solar PV module will be preferred (≥ 200 W) as such Lowest bidder may be requested to supply higher size modules if already not offered.
- 7.9. Solar module shall be laminated using lamination technology using established polymer (EVA) and Pedlar/Polyester laminate.
- 7.10. 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

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cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing during life of the solar modules.

- 7.11. Photo conversion efficiency of SPV Module should be greater than 14%. Module shall be made of high transmittance glass front surface giving high encapsulation gain.
- 7.12. Cell used in offered module should of reputed make. The bidder should specify the make in Bid itself cell to be used and before supply same should be got approved from the department.
- 7.13. Module rating is considered under standard test conditions, however Solar Modules shall be designed to operate and perform under site condition including high temperature & dust (sometimes).
- 7.14. 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 more than 25 years.
- 7.15. Solar PV Module design shall conform to following requirement:
 - a. 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.
 - b. Resistant of water, abrasion, hail impact, humidity & other environment factor for the worst situation at site.
- 7.16. The offered module shall have a Power warranty of 25 years with degradation of power generated not exceeding 20% of the minimum rated power over the 25 years period and not more than 10% after ten years period.
- 7.17. The fill factor of module shall not be less than 0.70 (typical).
- 7.18. The V-I curve of each PV module with Sl. Nos. should be submitted along with Modules meeting the required specifications.
- 7.19. Identification and Traceability: 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, I_m , V_m 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
 - x. Other relevant information on traceability of Solar cell and module as per ISO 9000 series.
- 7.20. Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition).
- 7.21. Entire drawings, detailed test reports of the offered modules should be submitted for approval of department within 15 days from the date of placement of detailed order or 21 days from Letter of Award whichever is less and supply should start thereafter.

8 PV ARRAY CONFIGURATIONS:

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

9 MODULE MOUNTING STRUCTURE (FIXED):

- 9.1 The structure design shall be appropriate and innovative and must follow the existing structure and profile. The bidder may choose to offer module mounting structure as per their design/ economics.
- 9.2 The module alignment & tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided based on the location of array installation.
- 9.3 The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement
- 9.4 The mounting steel structure shall be as per latest BIS 2062 (amended up to date) and galvanisation of mounting structure shall be in compliance of BIS 4759 (amended up to date) .
- 9.5 The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- 9.6 Nut & bolts, supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.
- 9.7 All fasteners shall be of stainless steel of grade SS 304.
- 9.8 The array structure shall be grounded properly using maintenance free earthing kit.
- 9.9. The support structure & foundation shall be so designed to withstand speed for wind zone of the location as given in relevant Indian wind load codes/ standards.
- 9.10. IS 800-2007 shall be followed for structural design. Contractor shall submit the DBR and STADD calculations along with the structural design within 10 days for approval of the department.
- 9.11. SPV module mounting structure
 - a. Type: Fixed
 - b. Azimuth: 0 degree True south
 - c. Tilt Angle: At altitude or as per site requirement.
- 9.12 Hot dipped Galvanized Steel Structural must be considered for all type of structural steel proposed for the power plant.
- 9.13 Design drawings with material selected shall be submitted for prior approval of department within 10 days of detailed order. The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings. The drawings along with detailed structure design and material selected and their standards shall be submitted in four sets to the department for approval before starting the execution work. The work will be carried out as per design approved by the department.

10 STRING COMBINER BOX OR ARRAY JUNCTION BOXES:

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

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- 10.3 Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- 10.4 The junction box shall be with protection class IP 65 for mounting outside in Open weather condition.
- 10.5 Each Array junction Box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600 V with suitable arrangement for its connecting.
- 10.6 The Array junction Box will also have suitable surge protection device.
- 10.7 The junction Boxes shall have suitable arrangement for the followings (typical):-
 - Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
 - Provide arrangement for disconnection for each of the groups
 - Provide a test point for each sub-group for quick fault location
 - To provide group array isolation
- 10.8 The current carrying ratings of the junction Boxes shall be suitable with adequate safety factor, to inter connect the Solar PV system corresponding to 260 kwp.

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11 POWER CONDITIONING UNIT (PCU)

- 11.1 Power Conditioning Unit (PUC), grid interactive in nature, shall consist of MPPT controller, inverter of rating 260 kw, associated control and protection devices etc. all integrated into PCU. It shall provide necessary protections for Grid Synchronization and Data Logging/Monitoring. The PCU should convert DC power produced by SPV modules in to AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid. The bidder may choose the inverter as string/Central as per their Design/ Project Philosophy.
- 11.2 The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides 3-ph, 415V AC/ (+15% to – 10%), 50+/-1.5 Hz with total harmonic voltage distortion less than 3% to synchronize with local grid . DC voltage ripple content shall be not more than 3%.
- 11.3 The PCU shall be of very high quality having efficiency not less than 97% and shall be capable of running in integrated mode.
- 11.4 Degree of protection of the indoor PCU shall be at least IP-31 and that of outdoor at least IP-55.
- 11.5 Built in with data logging to remotely monitor plant performance through external PC shall be provided (PC shall be provided along with SPV Plant).
- 11.6 The PCU shall be designed for continuous, reliable power supply as per specification.
- 11.7 The PCU should be designed to be completely compatible with the SPV array voltage and Grid supply voltage and D G set Voltage.
- 11.8 The dimension, weight, foundation details etc. of the PCU shall be clearly indicated in the detailed technical specification.
- 11.9 The system should be capable of providing all the data including that of meter and PCU to the central software on IEC-104 protocol. All the equipments /hardware /software for complying to the same will be in the bidder"s scope.
- 11.10 The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently& automatically.
- 11.11 Both AC & DC lines shall have suitable fuses, Metal Oxide Arrestors/surge arrestors and contactors to allow safe start up and shut down of the system. Fuses used in the DC circuit should be DC rated.
- 11.12 PCU shall operate in sleeping mode when there will no power connected.
- 11.13 Protections:
- Over voltage both at input & output.
 - Over current both at input & output.
 - Over/under grid frequency.
 - Heat sink over temperature.
 - Short circuit.
 - Protection against lightening.
 - Surge arrestors to protect against Surge voltage induced at output due to external source.
 - Any other protection in view of D G set.
 - Anti- Islanding Protection
- 11.14 It should have user friendly LED/LCD display for programming and view on line parameters such as:

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- Inverter per phase Voltage, current, kW, kVA and frequency,
- Grid Voltage and frequency,
- Inverter (Grid) on Line status,
- PV panel voltage,
- Solar charge current and ambient temperature,
- Individual power stage heat sink and cabinet temperature,
- Solar Radiation (with external pyranometer with in scope)
- Inverter Import export kWh summation
- Solar kWh summation
- Inverter on
- Grid on
- D G set on
- D G set voltage, current, power output
- Inverter under voltage/over voltage
- Inverter over load
- Inverter over temperature.

- 11.15 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.
- 11.16 The 3 phase PCU shall be from internationally reputed firms, which will incorporate latest Technological advance to provide highly reliable and efficient energy conversion from DC to AC.
- 11.17 PCU shall be capable to synchronize independently & automatically with Discom grid power line frequency to attain synchronization and export power generated by solar plant to grid and D G set (when it is operating).
- 11.18 The PCU shall be capable of complete automatic operation, including wake-up, synchronization & shut down.
- 11.19 Typical failure analysis report of PCUs and recommended list of critical components shall be provided by the bidder while submitting their offer.
- 11.20 The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line fault currents and line to ground fault currents.
- 11.21 The PCU shall be able to withstand an unbalanced load conforming to IEC standard and relevant 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.
- 11.22 The PCU shall go to shutdown/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay.
- When the power available from the PV array is insufficient to supply the losses of the PCU, the PCU shall go to standby/shutdown mode
 - The PCU control shall prevent excessive cycling of shut down during insufficient solar radiance

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11.23 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

- i. Neutral voltage displacement
- ii. Over current
- iii. Earth fault
- iv. And reverse power

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

11.24 Detailed technical description of the complete unit of offered PCU should be furnished with bid document Following Technical documents of PCU shall be supplied for approval after placement of order.

- Detailed technical description of the complete unit
- Instructions for installation and operation
- Electrical diagrams of all internal cabling, necessary for installation, maintenance and fault finding
- Description of electrical and mechanical characteristics of units.
- Maintenance and fault finding procedures.
- Safety precautions
- Software for data monitoring with detailed description
- Details of data acquisition
- Details of Telemetry linking
- Factory test reports in details on various parameters
- Trouble shooting procedures
- All maintenance requirements and their schedules, including detailed instructions on how to perform each task.
- 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 alt components and subsystems.
- A detailed bill of materials which shall list components model numbers, quantities and manufacturer of each supplied item.
- All documents and write ups shall be in English. They shall be clean and legible, and must be checked, signed, approved and dated by a competent representative of the contractor

11.25 The PCU should be installed indoor.

11.26 The Bidder shall provide data sheet for Power Conditioning Unit

12. DC DISTRIBUTION BOARD (DCDB)

DC distribution board shall be provided in between solar array and PCU. It shall have MCCB of suitable rating for connection and disconnection of array section. It shall have meters for measuring the array voltage and array current. DCDB can also be integrated into PCU for space saving.

13. AC DISTRIBUTION BOARD (ACDB)

- 13.1. Power conditioning unit installed in a control room converts DC energy produced by the solar array to AC energy. The AC power output of the inverter shall be fed to the ACDB (metering panel & isolation panel) which also houses energy meter. The 415V AC output of the isolation panel shall be fed to the grid. AC energy is then synchronized with the grid and power is consumed by load or may export to the grid.
- 13.2. ACDB shall be floor mounted type and shall have all the measuring instruments such as voltmeter, ammeter, frequency meter, Energy Meter {for measuring the deliverable units {kWh} for sale, selector switches and Mimic panel.
- 13.3. All the power cables shall be taken through top/ Bottom of the panel as per site requirement.
- 13.4. The ACDB shall fitted with suitable rating & size copper bus, MCCB, HRC fuses/circuit breaker/isolator, indicators for all incomer and outgoing terminals, LED voltmeter & Ammeter with suitable selector switches to monitor & measure the power to be evacuated.
- 13.5. Nut & bolts including metallic shall have to be adequately protected against atmosphere and weather prevailing in the area.
- 13.6. The overall dimension, weight, sheet thickness, painting etc. should be indicated by the Contractor.
- 13.7. Modifications/ addition if any, in existing L T panel and D G set panel of NIRD&PR shall be done at site and covered in scope of Bidder. Also required size cable and other equipment between existing panel to solar AC distribution panel is covered in scope of Bidder,

14 PLANT MONITORING DESK

- 14.1. Computer aided data acquisition unit shall have features for simultaneous monitoring and recording of various parameters of different sub-systems, power supply of the Power Plant at the DC side and AC side.
- 14.2. Computer Aided Data Acquisition Unit shall be a separate & Individual system comprising of different transducers to read the different variable parameters, A/D converter, Multiplexer, De-multiplexors, Interfacing Hardware & Software, Industrial Type PC, which will be robust & rugged suitable to operate in the Control Room environment.
- 14.3. Reliable sensors for solar Radiation, Temperature & other electrical Parameters are to be supplied with the data logger unit.
- 14.4. The computer and printers required will be supplied separately or made to use the existing ones.
- 14.5. The data acquisition system shall perform but not limited to the following operations
 - Inverter per phase Voltage, current, kW, kVA and frequency
 - Grid Voltage and frequency
 - D G set voltage, current, power output.
 - Inverter (Grid) on Line status
 - PV panel voltage
 - Solar charge current and ambient temperature
 - Heat sink and cabinet temperature

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- Solar Radiation (with external pyranometer with in scope)
 - System summation
 - Inverter Import export kWh
 - Solar kWh summation
 - Hours Run
 - Ambient air temperature near array field
 - Control room ambient air temperature
 - Module back surface temperature
 - Wind speed at the level of array plane
 - Solar irradiation incidental to array plane
 - Inverter efficiency
 - Solar system efficiency
 - Display of I-V curve of solar system dc bus output
 - DC injection (one time measurement) in to Grid shall be also made at the time of installation
- 14.6. All data shall be recorded chronologically date wise. The data file should be MS Excel compatible. The data logger shall have internal reliable battery backup to record all sorts of data simultaneously round the clock. All data shall be stored in a common work sheet chronologically. Representation of monitored data shall be in graphics mode and/or in tabulation form. All instantaneous data can be shown in the Computer Screen.
- 14.7. The Bill of Materials associated with the equipment must clearly indicate especially the detail about the PC, Modems, etc.
- 14.8 The data acquisition system should be housed in a desk made of sheet steel.
- 14.9 The performance and generation data shall be required to be recorded using an existing Computer. The monitoring system shall comprise of the following main components:
- ☐ PCU to log the inverter performance data and transmits the same to the Computer.
 - ☐ PC Data logging software should enable automatic long-time storage of measured data form PV- Plant. It should allow visualization, monitoring, commissioning and service of the installation.
 - ☐ Communication interface the entire system can be operated and monitored via various interface viz.(RS232, RS485, MPI, Profit-bus, Telephone modem), in addition to the information indicated on the operator panel.
 - ☐ Communication interface shall be an integral part of inverter and shall be suitable to be connected to local computer and also remotely via the web using WIFI modem.
- 14.10. Full fledge SCADA system for solar PV plant shall be provided.

15 METERING AND DATA MONITORING OF POWER PLANT:

- 15.1** The bidder shall install metering arrangement in accordance with the provisions of the Discom Practices & RERC order dated 30-05.2012 in the matter of determination of generic tariff for sale of electricity in the state to the distribution licenses from solar power plants, including roof top SPV systems. The installation of metering scheme shall be as per net metering scheme in force in Telangana and appended . The meter used for the purpose of import/ export shall be of accuracy class 0.2S as per relevant IS/IEC.

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- 16.1 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 by means of copper wire or strips.
- 16.2 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

17. CABLES AND ACCESSORIES**17.1 LT CABLES:**

1.1KV Grade, Al. Conductor PVC Armoured Cables in AC SIDE shall be used for all LT Power Cables between Power & Motor Control Cubicles, MCC, Respective feeders, etc. These cables shall be laid on structural supports and using Galvanized Cable trays of adequate strength. The cable shall be terminated using Al. Lugs of adequate cross section area. The PMCC"s and the MCC"s shall be located in the Basement with cable entry on top.

17.2 CONTROL CABLES AND DC SIDE CABLES:

1.1KV Grade, Cu. Conductor, PVC Armoured Cables shall be used for all control cables required for the Solar Power Plant. These cables shall be laid on structural supports and using Galvanized Cable trays of adequate strength. The cable shall be terminated using Cu. Lugs of adequate cross section area.

- a. Cu. Conductor, PVC Armored with miller insulation between each pair and tinned copper screening. All cables shall be PVC insulated with appropriate grade conforming to IS.
- b. Only copper conductor cables of reputed make shall be used in DC side of plants between interconnection of MODULES, JUNCTION BOX, PCU, LT Interfacing panel/ Dc panel and other associated equipments.
- c. The wiring for module inters connection shall be with hard PVC conduit of approved make. All Tees, Bends etc., shall be approved make. Before procurement, approval for materials should be obtained from the department.

17.3 Cables of appropriate size to be used in the system shall have the following characteristics:

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- Will meet IS 694/1554 standards
- Temp. Range –10 degree centigrade to +80 degree centigrade
- Voltage rating 660/1000V
- Excellent resistance to Heat, Fire, oil, cold, water, abrasion, UV radiation
- Flexible Cabling on DC side of the system shall be as short as possible to minimize the voltage drop in the wiring. Components and hardware shall be vandal and theft resistant. All parts shall be corrosion resistant. The system description, general/technical requirements etc. are given for general guidance only.

17.4 CABLE ACCESSORIES

- Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted..
- Cables inside the control room shall be laid in suitable Cable Trays of approved type.
- 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.
- The terminal end of cables and wires are to be fitted with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.

18 EARTHING

- a. Each array structure of the SPV Yard/shed shall be grounded properly. The array structure are to be connected to earth pits as per IS standards. Junction boxes, lighting conduits shall be connected to the main earthing conductor/ electrode.
- b. Earthing system installation shall be in strict accordance with the latest editions of Indian Electricity Rules, relevant Indian Standards and code of practices and the local statutory authority regulations.
- c. Neutral points of system metallic enclosures and frame works, not forming part of electric supply shall be connected to main earthing system.
- d. Necessary Test Point provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- e. 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.
- f. Earth resistance of the earth pits shall be tested in presence of the representative of the department
- g. Earthing Layout: The contractor shall submit to the department earthing drawings showing the location of earthing conductors, for their approval.

19 LIGHTNING & OVER VOLTAGE PROTECTION

- a. The SPV Power Plant should be provided with Lightning and over voltage protection connected to proper earth mats. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.

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- b. The bidder shall ensure adequate lightning and over voltage protection to provide and acceptable degree of protection as per IS for the array yard/Shed.
- c. The lightning Masts / Conductors shall be made as per applicable Indian Standard/International Standard in order to protect the entire Array Yard/ Shed from Lightning stroke.
- d. 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.
- e. The lightning masts / conductor shall be earthed through flats and connected to the Earth mats 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.
- f. Design calculations and detailed explanations (in 4 sets) shall be provided for approval of **department** within 15 days of order.

20 MINIMAL TECHNICAL REQUIREMENTS/ STANDARDS FOR SOLAR PHOTOVOLTAIC (PV) POWER PLANTS/ SYSTEMS TO BE DEPLOYED UNDER THE NATIONAL SOLAR MISSION (As per MNRE letter no 5/23/2009-P&C/SE dated 8th June 2012)

20.1 PV MODULES:

20.1.1 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 / IS14286
Concentrator PV Modules & Assemblies IEC 62108

20.1.2 In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 requirements for testing, for safety qualification. 20.1.3 PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) must qualify Salt Mist Corrosion Testing as per IEC 61701.

20.2 BALANCE OF SYSTEM (BoS) ITEMS/ COMPONENTS:

20.2.1 The BoS items / components of the SPV power plants/ systems deployed under the Mission must conform to the latest edition of IEC/ equivalent BIS

Standards as specified below**:

BoS item/component	Applicable IEC/equivalent BIS Standard	Standard Number
Standard Description		
Power Conditioners/ Inverters*	Efficiency Measurements	IEC 61683
	Environmental Testing	IEC 60068 2 (6,21,27,30,75,78)
Charge controller/ MPPT units*	Design Qualification Environmental Testing	IEC 62093 IEC 60068 2 (6,21,27,30,75,78)

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Storage Batteries	General Requirements & Methods of Test Tubular Lead Acid	IEC 61427 IS 1651/IS 133369
Cables	General Test and Measuring Methods PVC insulated cables for working Voltages up to and including 1100 V-Do-, UV resistant for outdoor installation	IEC 60189 IS 694/ IS 1554 IS/IEC 69947
Switches/ Circuit Breakers/Connectors	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 System design verification	IEC 62124
Installation Practices	Electrical installation of buildings Requirements for SPV power supply systems	IEC 60364-7-712

20.3. AUTHORIZED TESTING LABORATORIES/ CENTERS

- 20.3.1 The PV modules must be tested and approved by one of the IEC authorized test centres. Test certificates can be from any of the NABL/ BIS Accredited Testing /Calibration Laboratories. Qualification test certificate as per IEC standard, issued by the Solar Energy Centre for small capacity modules up to 37Wp capacity will also be valid.
- 20.3.2 Test certificates for the BoS items/ components can be from any of the NABL/BIS Accredited Testing-Calibration Laboratories/ MNRE approved test centres. The list of MNRE approved test centres will be reviewed and updated from time to time.

20.4. WARRANTY

- 20.4.1. The mechanical structures, electrical works including power conditioners/ inverters /charge controllers/ maximum power point tracker units/ distribution boards/digital meters/ switchgear/ storage batteries, etc. and overall workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years.
- 20.4.2. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

20.5. IDENTIFICATION AND TRACEABILITY

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

MNRE No.5/23/2009-P&C Dated 16.06.2010

- (i) Name of the manufacturer of PV Module
- (ii) Name of the Manufacturer of Solar cells
- (iii) Month and year of the manufacture (separately for solar cells and module)
- (iv) Country of origin (separately for solar cells and module)
- (v) I-V curve for the module
- (vi) Peak Wattage, I_m , V_m 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
- (x) Other relevant information on traceability of solar cells and module as per ISO 9000 series.

21 ERECTION, TESTING & COMMISSIONING

- a. The installation shall be carried out by an electrical contractor holding a valid license as required by the State Government Authorities.
- b. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection. It shall be the sole responsibility of the contractor in obtaining safety certificate / approval from local statutory authorities.
- c. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost
- d. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the department, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract.
- e. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- f. Clearing the site after completion, of erection as well as regular clearance of unwanted materials from site, shall also be included under this scope of work.
- g. All equipment and instruments, indoor and outdoor, shall be marked with Numbers and provided with suitable danger boards as per Indian electricity Rules/code etc before commissioning.
- h. The contractor shall touch up the surface with paint of same shade for equipments, which are scratched and / or damaged during transportation and erection before commissioning.
- i. The contractor shall employ skilled and semi-skilled labourers for erection, testing and commissioning as required. All the electricians, cable jointers, wiremen, welders and

others employed shall possess valid certificates / license recognized by competent authorities.

- j. The contractor shall set up his own facilities at site at allocated place to undertake fabrication/assembly jobs etc.
- k. The Contractor shall carry out civil engineering works as called for in scope of work pertaining to electrical equipment's like foundation for modules structures as per the latest relevant drawings. For this they may carry out minor civil works such as foundation bolts, cutting holes in walls, chipping of floor and ceiling etc. making good the same after installation of the equipment and any other minor civil works required for completion of the work has to be carried out without any extra charges.
- l. During erection, care is to be taken to see that painting does not peel off at any place and if so, it has to be given a 'Touch-up' after erection by the contract.

22 SPECIFICATION FOR TESTING & COMMISSIONING

The testing and commissioning for all electrical equipment at site shall be according to the procedures listed below:

- a) All electrical equipment shall be tested, installed and commissioned in accordance with the latest relevant standards and code of practices published by Indian Standards Institution wherever applicable and stipulations made in relevant general specifications.
- b) The testing of all electrical equipment as well as the system as a whole shall be carried out to ensure that the equipment and its components are in satisfactory condition and will successfully perform its functional operations. The inspection of the equipment shall be carried out to ensure that all materials, workmanship and installations conform to the accepted design, engineering and construction standards, as well as accepted code of practices and stipulations made in the relevant general specifications.
- c) The contractor in the presence of representative of the department shall carry out all tests using his own calibrated instruments, testing equipment as well as qualified testing personnel.
- d) The results of all tests shall conform to the specification requirements as well as any specific performance data, guaranteed during finalization of the contract.

23 PREPARATION OF THE EQUIPMENT FOR COMMISSIONING;

- a) After completion of the installation at site and for the preparation of plant commissioning, the contractor shall check all the equipment and installation in accordance with the agreed standards, latest relevant code of practices of Indian Standards and specific instructions furnished by the particular equipment suppliers as well as purchaser.
- b) Checking required to be made on all equipment and installations at site shall comprise, but not limited to, the following:
 - Physical inspection Modules for removal of any foreign bodies, external defects, such as damaged, loose connection in Junction Boxes & PCU etc . loose foundation bolts etc.
 - Check for the free movement of mechanism for the circuit – breaker, rotating parts of the rotating machines and devices

- Check for tightness of all cable joints and busbar termination ends as well as earth connections in the main earthing network.
 - Check for clearance of live bus bars and connectors from the metal enclosure
 - Check for proper alignment of all the modules etc
 - Continuity checks in case of power and control cables
 - Checking of all mechanical and electrical interlocks including tripping of breakers using manual operation of relay.
 - Checking of alarm and annunciation circuits by manual actuation of relevant relays
 - Check and calibrate devices requiring field adjustment/calibration like adjustment of relay setting etc.
 - Check for proper connection to earth network of all non-current carrying parts of the equipment and installation
- c) The relevant tests shall be carried out in accordance with relevant IS of latest issue. The tests which are to be carried out on the equipment shall include, but not be limited to, the following:
- i) Check for completeness of installation.
 - ii) Each pole to earth insulation resistance test.
- d) Cables**
- i) Insulation resistance test shall be conducted by Magger for cables rated up to 1.1kV grade.
 - ii) All 1.1 kV cables shall be subjected to high voltage test after joining and terminating but before commissioning as per relevant standards.
 - iii) In each test, the metallic sheath / screen / armour should be connected to earth.
 - iv) Continuity of all the cores, correctness of all connections as per wiring diagram, correctness of polarity and phasing of power cables and proper earth connection of cable glands, cable boxes, armour and metallic sheath, shall be checked.
- e) Earthing**
- i) Tests to ensure continuity of all earth connections.
 - ii) Tests to obtain earth resistance of the complete network by using earth tester. The test values obtained shall be within the limits (less than 3 ohms).

TECHNICAL SPECIFICATIONS

[TO BE INCORPORATED AS PER REQUIREMENT OF THE WORK PUT TO TENDER DULY QUOTING THE RELEVANT SPECIFICATION NUMBER OF APSS. BSI Code No. ,MOST, etc. STANDARD SPECIFICATION NO.]

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DRAWINGS

1.0 DRAWINGS:

- 1.1 The plans enclosed with the tender are liable to be altered during execution of work as per necessity of site conditions. The premium quoted by the contractor for various items shall hold good for execution of work even with altered plans.
- 1.2 One set of drawings, on the basis of which actual execution of the work is to proceed shall be furnished free of cost to the contractor by the Superintending Engineer / EXECUTIVE ENGINEER- NIRDPR progressively according to the work program submitted by the contractor and accepted by the Superintending Engineer / EXECUTIVE ENGINEER- NIRDPR. Drawings for any particular activity shall be issued to the contractor at least 30 days in advance of the scheduled date of the start of the activity. However, no extra claims by the contractor toward any delay in issue of drawing or issue of any revision / change to the drawings issued earlier shall be admissible. The Superintending Engineer shall intimate the contractor 7 days in advance regarding any delay to issue of drawings, for any particular stage of works. If work gets effected due to delay to issue of drawings, for any particular stage of work the contractor shall be granted extension of time in terms of condition 14.7 of tender notice.
- 1.3 Signed drawings above shall not be deemed to be an order for work unless they entered in the agreement or schedule of drawings under proper alterations of the contractor and EXECUTIVE ENGINEER- NIRDPR or unless they have been sent of the contractor by the EXECUTIVE ENGINEER- NIRDPR with a covering letter confirming that the drawing in and authority for work in contract.

2.0 DISCREPANCIES:

- 2.1 In case of discrepancies between documents the following order of procedure shall apply:-
- 2.1.1 Between the written description of written dimensions in the drawings and the corresponding one in the specifications, the latter shall apply.
- 2.1.2 Figured dimensions shall supersede scaled dimensions. The drawings on a larger scale shall take precedence over those on a smaller scale.
- 2.1.3 Drawings issued as construction drawings from time to time shall supersede tender drawings and also the correspondence drawings previously issued.

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Note: The contractor should not execute any component of work without obtaining the working drawings. Any work done without drawings shall be at the contractor's responsibility only. Acceptance for such work will be at the discretion of the EXECUTIVE ENGINEER- NIRDPR.

3.0 SECRECY CLAUSE

The drawings and specifications made available to the tenderer shall exclusively be used on the work and they are retained from passing on each plan to any unauthorized hand either in parts or in full under the provisions of Section-3 and 5 of the official secrets Act 1923. Any violation in this regard will entail suitable action under appropriate clause or official secret Act 1923.

GENERAL TERMS AND CONDITIONS:

1. The work in general shall conform to CPWD specifications Vol.-I, Vol.-VI/ electrical specifications with up to date correction slips and as directed by the Engineer-in-charge.
2. The rate shall be mentioned both in figures and words, the rates mentioned in words will be taken as correct rates.
3. The rates are net and inclusive of all taxes transport royalty, GST ., octroi etc., and nothing extra to be paid on any account.
4. No T & P will be issued by NIRD.
5. A variation of 10% is allowed in quantities for all the times.
6. The contractor should make his own arrangements for all the materials including cement, steel etc., and shall be kept under the control of the EXECUTIVE ENGINEER- NIRDPR, ISI., approved products only shall be used.
7. The water is to be arranged by the contractor at his own cost, if any time the water is supplied by NIRDPR a deduction of 1% of the bill amount will be deducted from the bill.
8. The payment will be made as per actual measurements.
9. Any damage to the adjacent structure shall be made good by the contractor at his own cost.
10. The right to reject any or all the tenders reserve with the EXECUTIVE ENGINEER- NIRDPR
11. The contractor shall clear the site properly after completion of the work.
12. The income tax and other statutory recoveries will be recovered from the gross amount of the bills as per rules.
13. The time limit for the completion of the work is as mentioned in tender notice and any delay beyond the stipulated time period compensation will be levied from the contractor as per CPWD rules.
14. No labour will be allowed to stay in the campus in nights however the chowkidar who looks after the materials of the contractor will be allowed to stay.
15. The contractor should procure cement (OPC) from the reputed companies such as CORAMANDEL, KCP. ACC., AMBUJA, ULTRA TEK etc., as directed by Engineer-in-charge.
16. The contractor should procure steel from the reputed firms.
17. The contractor has to submit the GST Registration certificate before recording Ist Running Account bill..

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