



**ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY  
BHUBANESWAR**

**Invites Tender**

**For**

Supply, Installation (Erection), Testing, Commissioning, Warranty and Comprehensive Maintenance Contract for a period of 5 years of various types of Solar Water Pumping System in the state under Off-Grid and Decentralized Solar PV Programme of MNRE on Rate Contract

**Tender Call Notice-2646 Dt-21.07.2017**

**S-3/59, MANCHESWAR INDUSTRIAL ESTATE, BHUBANESWAR-751010**

**Phone : (0674) 2585898,2581552,2580554. Fax:2586368**

**Website: [www.oredaorissa.com](http://www.oredaorissa.com),**

**Email: [ceoreda@oredaorissa.com](mailto:ceoreda@oredaorissa.com)**

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## **Disclaimer**

Kindly Note:

1. This document is not transferable
2. Though adequate care has been taken for preparation of this document, the bidder shall satisfy himself that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any bidder on the pre bid meeting or within ten days from the date of issue of the bid document, it shall be considered that bid document is complete in all respects and has been received by the bidder.
3. The Odisha Renewable Energy Development Agency (OREDA) reserves the right to modify, amend or supplement this bid document keeping in view the necessity in implementation of the scheme at any time before date of submission of bid.
4. While the bid document has been prepared in good faith, neither OREDA nor their employees or advisors make any representation, warranty, express or implied or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability and completeness of this bid document, even if any loss or damage is caused by any act or omission on their part.

**ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY**

**S-3/59, MANCHESWAR INDUSTRIAL ESTATE, BHUBANESWAR-751010**

**Phone : (0674) 2588260,2586398,2580554. Fax:2586368**

**Website: [www.oredaorissa.com](http://www.oredaorissa.com),**

**Email: [ceoreda@oredaorissa.com](mailto:ceoreda@oredaorissa.com)**

**NOTICE INVITING E-TENDER**

**E-TENDER NOTICE NO:2646 /OREDA**

**DTD-21/07/2017**

ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY invites sealed e-tenders **in two part bidding system** from manufacturer, system integrator, EPC firms for Supply, Installation (Erection), Testing, Commissioning, Warranty and Comprehensive Maintenance Contract for a period of 5 years of various types of Solar Pumping System under Off-Grid and Decentralized Solar PV Programme of MNRE in the state of Odisha on rate contract.

Date of release of bid	23.7.2017
Pre-bid meeting to be held	5.08.2017
Revised & final online bid document hoisting	08.08.2017
Date and time of last submission online	22.08.2017 at 5.00 PM
Date and time of submission of hard copy of documents.	24.08.2017 at 1-00 PM
Opening of Techno-commercial bid (Part-I)	24.08.2017 at 3.00 PM
Date of opening of the price bid(part-II)	To be informed to the qualified bidders.

Interested prospective bidders may visit OREDA's website [www.oredaorissa.com](http://www.oredaorissa.com) and [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) for details relating bidding process and all other terms and conditions. The bidders can view the tender documents from [www.oredaorissa.com](http://www.oredaorissa.com) website free of cost. Amendments if any will be published in the OREDA website only. No further notification will be made in the news paper.

Sd/-Dt.20.7.2017

**Chief Executive, OREDA**

## DETAIL OF NOTICE INVITING TENDER

ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY invites sealed e-tenders **in two part bidding system** from manufacturer, system integrator, EPC firms for Supply, Installation (Erection), Testing, Commissioning, Warranty and Comprehensive Maintenance Contract for a period of 5 years of various types of Solar Pumping System under Off-Grid and Decentralized Solar PV Programme of MNRE in the state of Odisha on rate contract.

Particulars	Estimated Cost (Rs. )	Earnest Money Deposit (Rs.)	Tender processing fee Non refundable (in Rs.)	Non refundable Cost of Bid document	Last date/time for submission of bids	Date and time of opening of Technical bid
Supply, installation, commissioning including warranty and Comprehensive Maintenance Contract for a period of 5 year of solar water pumping systems of various capacity complete in all respect as per the technical specification(MNRE/ IEC /BIS), schedule of materials and terms and condition of the of the work award from time to time on the basis of the lowest price arrived at within a period of minimum one year of the valid tender under the scope of work	2000 project likely to enhance <b>Rs.100,00,00,000</b>	<b>Rs 10,00,000</b>	2300 or as admissible	<b>Rs. 10500/-</b>	<b>Online – 22.08.2017 at 5.00 PM Hard copy – 24.08.2017 at 1.00 PM</b>	<b>24.08.2017 at 3.00 PM</b>

Interested prospective bidders may visit OREDA's website [www.oredaorissa.com](http://www.oredaorissa.com) and [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) for details relating bidding process and all other terms and conditions. **The bidders can view the tender documents from [www.oredaorissa.com](http://www.oredaorissa.com) website free of cost. The authority reserves the right to accept / reject any part thereof or all the bids without assigning any reason.**

Sd/- dt-20.7.17

Chief Executive, OREDA

## ONLINE SUBMISSION OF BID

### **General Information**

- i) Interested bidders may visit OREDA's website [www.oredaorissa.com](http://www.oredaorissa.com) or [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) for details. **Tender documents can be viewed free of cost.**
- ii) Bidders who want to submit bid shall have to pay the **tender cost**. The tender cost is required to be paid in shape of **Demand draft** only, drawn in **favour of Chief Executive, OREDA payable at Bhubaneswar**. The tender cost is inclusive of VAT @ 5% and is non refundable.
- ii) The bidders shall have to submit the non-refundable tender processing fee in e-payment mode only. The processing is inclusive of service tax.  
*(NOTE: For tender processing fee to K.S.E.D.C. Ltd. Bangalore, the bidder can use various modes of e-payment facility available through Tender wizard Portal, i.e. by Credit Card, Debit Card, Net Banking).*
- iv) The bidders shall have to scan the Demand Draft / Bank guarantee towards **EMD, Tender Cost, Signed copy of** unconditional acceptance of all terms and conditions of the tender, **Signed copy of** Confirmation to Technical Specifications and all **other documents as required in the tender** and upload the same in the prescribed form in .pdf or .jpg format in addition to sending the originals.
- v) The bidders are advised to register their user ID, Password, company ID on website [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) by clicking on hyper link "**Register Me**".
- (v) Any clarifications regarding the scope of work and technical features of the project can be had from the undersigned during office hours

**NB:** All subsequent addendum/Corrigendum to the tender shall be hoisted in OREDA's official web site [www.oredaorissa.com](http://www.oredaorissa.com) and [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) only.

**For and on behalf of OREDA**

#### **A. MODE OF SUBMISSION OF BID:-**

- i) The bidder shall submit the bid in Electronic Mode only i.e. in [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) portal. The bidder must ensure that the bids are received in the specified website of the OREDA by the date and time indicated in the Tender notice.
- ii) Bids submitted by telex/telegram will not be accepted.
- iii) The OREDA reserves the right to reject any bid, which is not submitted in electronic mode and according to the instruction, stipulated above.

## **(A-1) PARTICIPATION IN e-TENDER:-**

### **ACQUISITION OF DIGITAL SIGNATURE CERTIFICATE**

- i) For all the users it is mandatory to procure the Digital Signatures of **Class III only**.
- ii) Contractors / Vendors / Bidders / Suppliers are requested to follow the following steps for registration.

### **(A-2) REGISTRATION IN TENDER WIZARD PORTAL**

- i) Log in [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) Click "Register", fill the online registration Form.
- ii) Payment shall be made to KSEDCL, Bangalore for vendor registration in tender wizard portal in **e-payment** mode only.
- iii) As soon as the verification is done the e-tender user ID will be enabled/provided.

### **(A-3) ON-LINE REQUEST FOR e-TENDER DOCUMENTS.**

After viewing Tender Notification in [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) if bidder intends to participate in tender, he has to use his e-tendering User ID and Password which has been received after registration and acquisition of DSCs (Digital signature certificate). If any Bidder wants to participate in the tender he has to follow the instructions given below.

1. Insert the PKI (which consists of your Digital Signature Certificate) in your System.  
**(Note: Make sure that necessary software of PKI be installed in your system)**
2. Click / Double Click to open the Microsoft Internet Explorer
3. (This icon will be located on the Desktop of the computer).
4. Go to Start > Programs > Internet Explorer. Type [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) in the address bar, to access the Login Screen.
5. Enter e-tender User Id and Password, click on "Go". Click on "Click here to login" for selecting the Digital Signature Certificate. Select the Certificate and enter DSC Password. Re-enter the e- Procurement User Id Password
6. Click "Un Applied" to view / apply for new tenders.
7. Click on Request icon for online request. After making the request, bidder has to pay the requisite tender processing fee (as indicated in tender notice) through **e-payment** facility only available in the portal. Bidders will receive the Tender Documents which can be checked and downloaded by following the below steps.
8. Click to view the tender documents which are received by the user. Tender document screen appears.
9. Click "Click here to download" to download the documents.

**NOTE: For vendor registration and payment of tender processing fee to KESDCL, the bidder can use various modes of e-payment facility available through Tender wizard Portal, i.e. by Credit Card, Debit Card, Net Banking.**

## **(B) ONLINE SUBMISSION OF BID**

The bidders shall have to scan the Demand Draft / Bank guarantee towards **EMD , Tender Cost**

, **signed copy** of “unconditional acceptance of all terms and conditions of the tender”, Signed copy of “confirmation to technical specification” and **other documents** as required for the tender and **upload** the same in the prescribed form in .pdf or .jpg format in addition to sending the original **except bid sheets (.xls)** prior to last date and time of receipt of bids as specified in tender Notice. Tender processing fees is mandatory & to be paid on **e-payment** mode as stated elsewhere in the document. The attachments should be properly renamed before uploading.

### **(B-1) PROPER FILLING UP OF THE PRICE SCHEDULE:**

The bidder should fill up the Techno commercial and price schedule properly in the bid sheets provided in .xls format and up-load the same without changing the file name. The tender may be rejected if the schedule of price is submitted in incomplete form.

**NB: The bid sheets (.xls file) shall be uploaded in [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) portal, prior to online closing of the tender. By no other means (except online) price bid shall be accepted for evaluation of tender.**

- i. After completing all the formalities, Bidders will have to submit the tender as specified in NIT and must take care of all instructions. Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.

**Note down / take a print of bid control number once it displayed on the screen**

- ii. Tender Opening event can be viewed online.
- iii. Competitors bid sheets are available in the website for all participated bidders.

### **NOTES:**

**For any assistant, Contact:**  
**E-Tendering help desk number: 080-**  
**40482000/121/133/140(Bangalore) OREDA Help Desk-**  
**09776823641/09937140591**

## **(C) DEAD LINE FOR SUBMISSION OF BIDS**

- i) Soft copy of the bid shall be uploaded through the portal [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) on or **before the online submission time and date as stipulated in the bidding document.**

**DD towards Tender cost, DD/BG towards Bid Security, tender processing fee acknowledgement & a set of all uploaded documents including uploaded Techno-commercial Bid must be received by OREDA at the address specified not later than the time and date stated in the tender notification.**



- ii) In the event of the specified date for the submission of bids being declared a holiday for OREDA, the bids will be received on the next working day as per the time indicated in tender notification.
- iii) OREDA may, at its discretion, extend this deadline for submission of bids by amending the Bidding Documents in accordance with Instruction to Bidders for the reasons specified therein at any time prior to opening of, in which case all rights and obligations of Employer and bidders will thereafter be subject to the deadline as extended.

**(D) LATE BIDS**

- i) Soft copy of the bid will not be uploaded on the portal after expiry of submission time and the bidder shall not be permitted to submit the same by any other mode. In such case, even if the bidder has submitted the specific documents in hard copy in original (viz., bid security, tender cost & any other document) within the stipulated deadline, its bid shall be considered as late bid. The hard copy submitted [specific documents (viz., bid security, tender cost.)] shall be returned unopened to the bidder.
- i) Hard copy of the bid security i.e EMD in shape of DD/BG if received by OREDA after the last date for submission of the bid the same will be considered as late bid even if the bidder has uploaded the soft copy of the bid within the stipulated deadline. In such a case, the soft part of the bid uploaded on the portal shall be sent unopened to “Archive” and shall not be considered at all any further.

**(E) MODIFICATION AND WITHDRAWAL OF BIDS:-**

- i) Bidder may modify or withdraw their bids through the relevant provisions on the portal [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) up to due date and time of submission of bid indicated in tender notification
- ii) The Bidders may modify and resubmit their bids as per the provisions given in the portal.
- iii) Bidders may withdraw their bids through the relevant provisions of mentioned in the portal.
- iv) **No bid shall be modified/ withdrawn after the dead line for submission of bids. Withdrawal/modification of bid before the expiry of bid validity shall result forfeiture of Bidder’s bid security.**

**SUBMISSION OF HARD COPIES OF THE BIDS AND SEALING AND MARKING:-**

**(A)** Hard copies of the following items should only be submitted to OREDA

All the papers of bid documents as per the check list **except the price bid** duly signed & should be uploaded in **e-tender** portal. Hard copy (i.e EMD, Tender cost & signed e-tender document) shall be submitted OREDA office at S-57, Mancheswar Industrial Estate, Bhubaneswar 751010 before tender closing date and time.

**Submission of any documents other than the asked documents can't be received at any cost. This may lead to the rejection of bid.**

**(B) Technical bid:**

The Electronic Form/Template of the bid for the Techno-Commercial bid, as available on the portal, shall be duly filled and scanned copies of documents in support of meeting the minimum qualifying requirement of the tender shall be given as attachments.

**(C) Financial bid:**

The Electronic Form/Template of the Price bid (as available on the portal) shall be duly filled in.

**Any condition in regards to financial aspects, payments, terms of rebate etc beyond the prescribed financial terms of OREDA will make the bid invalid.**

Therefore it is in the interest of the bidders not to write anything extra in the Price Bid except price.

**ACCEPTANCE/REJECTION:**

OREDA reserves the right to accept / reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:

- i) Bid security is not deposited either in shape of Bank Draft in favor of OREDA payable at Bhubaneswar or in Bank Guarantee.

**Note: Bid security against previous Tenders, if any, will not be adjusted towards Bid security against this Tender.**

- ii) Complete Technical details are not enclosed.
- iii) Tender is received after the last date for what-so-ever reasons.

**PROCEDURE FOR OPENING THE BIDS:**

The procedure of opening of the bid shall be as under

- The TECHNICAL BID shall be opened at the time & date mentioned in the bid notice by OREDA in the presence of bidders, who choose to be present. If necessary, the firms may be called for Technical Presentation the schedule for which will be intimated by OREDA.
- The Price bid shall be opened after evaluation of technical suitability of the offers. The date for opening of Price bid shall be communicated subsequently. The Price Bid of only those bidders shall be opened who qualify in the technical bid.

***\*Contactors/Vendors are advised to upload their tender documents well in advance to avoid last minutes disappointed***

## **Background**

OREDA is the State Nodal Agency for off-grid Renewable energy system in the state. MNRE, Govt of India has sanctioned proposal for Solar PV pumping system under Off-grid and Decentralised PV irrigation and drinking water supply for the year 2017-18.

About 2000 or more irrigation / drinking water supply projects of various capacities will be taken up for all govt depts / other users. There is no specific assignment at this moment nor any feasible sites of projects. This will be covered in incremental manner. In view of the large geographical spread and limited time available for completion of the project it is contemplated to allocate the supply / installation to multiple qualified bidders subject to their acceptance of the L1 price discovered through the tender **subject to condition that qualified L1 bidder in each category shall have the claim of minimum 30% of the allocation on successful phase wise firm work order completion.**

### Check list of documents to be submitted along with the bid

Sl no	Particulars	Complied	Page-no / Flag
1	Bank draft for Rs.10,500/- or or exempt as admissible with proof of exemption	Bank No Dt	Envelope
2	Bank draft / BG for Rs.10,00,000/- towards Earnest Money deposit or exempt as admissible with proof of exemption	Bank No Dt	Envelope
3	Forwarding letter & Undertaking duly signed and stamped by the bidder. Undertaking to unconditionally accept all terms and conditions of the bid document with the endorsement <b>by Board Resolution</b>		
4	Valid document registering the status of the bidder as manufacturer /systems integrator / EPC / MNRE Channel partner		
5	Copy of the PAN card of the bidder's firm		
6	Copy of the TIN card of the bidder's firm		
7	Copies of latest Tax clearance certificate / returns		
8	Document of summerised <b>average annual turnover of 15 crore for last three years</b> duly signed and stamped by a registered chartered accountant on the letter head of the chartered accountant,2014-15,2015-16,2016-17(Prov). No annual report or balance sheet		
9	Proof of supply and installation of 500 pumps (AC / DC / surface / submersible) in the entire country in Govt / PSU / Govt Agencies. <b>Copies of certificates given by the authorised officer of concerned government agencies to be enclosed</b>		
10	Valid Test reports of offered Solar water pumping systems of capacity in the name of the bidder from valid MNRE accredited test lab		
11	Undertaking for Indigenousness (min 30 % domestic content) of the supplied items		
12	A self certificate on not debarred / black listed / default in any govt organization.		
13	<b>Filled in bid document duly signed and stamped at the bottom of each page except the price bid format</b>		

**Forwarding Letter**  
**(To be submitted in the letter head of the bidder)**

To,  
Chief Executive  
Odisha Renewable Energy Development Agency  
S-59, MIE, Bhubaneswar-751010  
Odisha

Subject: Submission of tender for the supply / installation of Design, Manufacturing, Testing, Supply, Installation, Commissioning & Maintenance of **Solar Pumping systems**.

Sir,

I/We have also read the various provisions of the Tender and confirm that the same are acceptable to us including the provision of CMC. We further declare that any additional conditions, variations, deviations, if any, found in our Tender offer shall not be given effect to. We further understand that **any deficiency / illegibility in documents shall make our tender liable for rejection**.

I/we submit our tender understanding fully well that

- (a) The bid and other documents submitted along with the same will be subject to verification by appropriate authorities.
- (b) OREDA reserves the right to accept or reject any application or the bid process itself without assigning any reasons thereof and shall not be held liable for any such action.
- (c) Any genuine changes made by the department in the interest of the work with respect to the technical requirement during the course of project implementation will be acceptable.

We hereby declare that all the information and statements made in this proposal are complete, true and correct and also accept that any misinterpretation contained in it may lead to our disqualification.

We hereby declare that our Tender is made in good faith and the information contained is true and correct to the best of our knowledge and belief.

Yours faithfully,

Signature of bidder

**Letter of Authorization**  
**(to be submitted in the letter head of the bidder)**

To,

Chief Executive  
Odisha Renewable Energy Development Agency  
S-59, MIE, Bhubaneswar-751010  
Odisha

Sub: Submission of tender for the supply / installation of Design, Manufacturing, Testing, Supply, Installation, Commissioning & Maintenance of Solar Pumping systems.

Ref: Tender Call Notice No. -----/ OREDA, dtd -----.

Sir,

I/we hereby authorise Ms. /Mr. \_\_\_\_\_, Designation .....of our company to sign all relevant documents on behalf of the company/firm in dealing with the above tender. She / He is also authorized to attend all meetings and submit technical and commercial information as may be required by OREDA in the course of processing of the tender.

We further authorise Ms. /Mr. \_\_\_\_\_ designation..... of our company to make technical presentation on behalf of the company.

Signature of the authorise persons

1. \_\_\_\_\_
2. ....

Signature attested

Name and designation of the attesting officer with stamp.

Yours faithfully

Head of the organization

## **UNDERTAKING BY THE BIDDER**

I/we here by undertake that

1. We have thoroughly read and examined the notice inviting tender and the tender document along with all its schedules, annexure etc.
2. The entire tender document has been discussed in the Board meeting and a resolution has been concurred for participation in the tender (copy enclosed)
3. The rates quoted by us are firm and final and are meant for execution of the allotted supply / installation within the time frame stipulated in the tender/supply / installation order.
4. All terms and conditions of the tender including the rates quoted by us shall remain valid for a period of minimum one year from the date of opening of the technical bids.
5. In case our tender is incomplete in any respect or we violate any of the prescriptions given in the tender for submission of the same OREDA shall , without prejudice to any other right or remedy , be at liberty to forfeit the earnest money deposited by us.
6. In case of award of supply / installation in our favour OREDA shall have the right to convert the EMD deposited by us in to full or part (as the case may be) of the security deposit against award of the supply / installation.
7. In case we fail to commence or complete the supply / installation as per the time schedules or fail to fulfill any of the terms and conditions given in the tender OREDA shall , without prejudice to any other right or remedy , be at liberty to forfeit the security deposit/EMD made by us against the award of the supply / installation.
8. I/We hereby declare that I/We shall treat the tender documents, specifications and other records connected with the supply / installation as secret/confidential and shall not communicate information derived there-from to any person other than a person to whom I/We have authorized to communicate the same or use the information in any manner prejudiced to the safety of OREDA/the State Govt.
9. I/We shall abide by all the laws prevailing at the time of the execution of the supply / installation and shall be responsible for making payments of all the taxes, duties, levies and other Govt. dues etc. to the appropriate Govt. departments.
10. We are not blacklisted / debarred / defaulted in any manner by any Central / State Government / Public Sector Undertaking in India.

11. In case any false documents submitted and found any time in future the firms shall be liable to be proceeded against as per prevailing laws.

12. Our state commercial tax / TIN registration no. is \_\_\_\_\_ and  
CST registration No. \_\_\_\_\_.

The PAN No. under the Income Tax Act is \_\_\_\_\_ and  
Service Tax Registration No. is \_\_\_\_\_.

10. I/We shall be responsible for the payment of the respective taxes to the appropriate authorities and should I/we fail to do so, I/we hereby authorize OREDA to recover the taxes due from us and deposit the same with the appropriate authorities on their demand.

**Signature of bidder with stamp & date**



## 1. SCOPE OF WORKS

The broad scope of the supply / installation includes design, manufacture, supply, installation, testing commissioning, warranty, operation & Maintenance for 5 years for Solar energy based pump for irrigation, drinking water supply comprising providing, installing, testing and commissioning of Solar Photovoltaic pumps sets with all accessories adhering to the standardized norm / BIS / MNRE specification (as per the valid test report issued to the bidder of the authorized test centre ) in the entire state in the current year 2017-18/ 2018-19.

**All tax deductions at source applicable for turnkey / EPC / contract will be made irrespective of Tax clearance documents subject to bifurcation of the price components.**

- a) Collection of the list of site / village including, locations of the bore wells, water discharge feasibility reports, shadow free area etc. from OREDA/authorized officer.
- b) Visit to the site / village and identifying the designated bore well and selection of site for construction
- c) Deciding the location required in site / habitations after discussing with the authorized officer / gram panchayat.
- d) Transportation of all materials to the village and keeping the same in safe own custody within village. OREDA shall not be the consignee to receive the materials supplied/ delivered.
- e) Installation of the solar PV water Pumping systems, BOS, solar PV array and required plumbing material as per the technical specifications and standards provided in the tender and testing the same in the presence of Dept Authorized Officer / gram panchayat . In case of sanitary well the float / pedestal arrangement to provide.
- f) Intimate OREDA, RE Cell Officials and EE / Authorized Officer, Divisions on assignments.
- g) Installation of the water delivery system up to the existing out let / inlet point.
- h) After initial operation and testing of the pumping system handing over the same to the Gram panchayat / Dept Authorised Officer to be maintained by the firm for 5 years under CMC.
- i) Collection of all documents, including geo-tagged photographs, if connected, of the installed systems and preparing the joint commissioning reports.
- j) Submission of all documents as detailed in the tender document including the joint

## Commissioning report to OREDA

- k) Periodic maintenance of the system as detailed in this tender.
- l) Opening of service centre/keeping servicing personnel and making available all essential spares in the vicinity of the solar water pumping system will give the desired performance with least interruption.
- m) Submission of periodic reports and returns as per the MIS prescribed by OREDA from time to time.
- n) Supply of the complete systems, including all necessary components, sub-components, spares, tools, tackles etc. as per technical specifications given or compliant with MNRE, IEC, BIS as relevant, in this document including packing, forwarding, safe storage, handling, commissioning, trial and performance testing and handing over, transit insurance.
- o) The solar panel shall be warranted for ten years with rated performance. Security cum PGF(PBG) for the corresponding amount for the period warranty is to be retained by this office.
- p) Solar PV pumps of respective capacity depending upon the yield of bore well will be utilized for the purpose of water supply in the user / utility as per the requirement of the village.
- r) Comprehensive Maintenance for 5 years and Performance guarantees for the rated delivery / discharge of water as per standard test condition.
- s) All civil structures and site clearances for setting up of the complete job are to be obtained before installation, if not provided in the work order.
- t) All structural drawings to be got approved from OREDA/ any other competent authority, if necessary, unless provided in the work award.
- u) While implementing Solar pumping system in the village the physical condition of the area on shades / water logging during rain should be taken into consideration.
- v) There should not be any damage what so ever in the site / village due to setting up of the solar pumping system and later there is no leakage of any water connection of the said project the in the village.
- w) While cabling the array care must be taken such that no loose / open cables lie anywhere related to the supply / installations.
- x) Adequate training has to be provided to the persons to be designated by OREDA/ pump users in maintenance and upkeep of the installed system. The installed and commissioned systems are to be handed over to the Village Committee / respective

Authorised Officer. The bidder must also provide a detailed operation and maintenance manual specific to the installed systems.

y) Before execution of the supply / installation the yield test of the selected tube well shall be carried out by the agency to ensure the sustainability of the system.

z) Supply/ installation of all essential transparency boards, markers and all essential; and required documents and manuals clearly explaining the operation and maintenance and trouble shooting of various portion of the system in local language.

## 2. ELIGIBILITY CRITERIA

In order to be eligible to participate in the tender, the bidder must fulfill the following eligibility criteria. Any discrepancy or deviation from the same shall make the bidder ineligible for participating in the tender and such tender documents shall be rejected.

- a) The bidder must be a company registered under the Indian Companies Act 1956 and a firm registered under statutory tax. The bidder must have valid GST registration certificate. The bidder after getting the work order must be willing to register under SGST if required.
- b) And the bidder must be a manufacturer of any component of solar pumps or a system integrator or EPC of the same or MNRE Channel partner. A copy of the registration certificate (DIC, NSIC, MSME, Register of Companies) to that effect is to be attached.
- c) And the Bidder must have Test Certificate issued in the name of the bidder only **for the offered model of pump** of Solar PV Water Pumping System from a MNRE authorized valid test center.
- d) And the bidder company must have **average annual turnover of Rs.15 crore** in last three years (2014-14,2015-16,2016-17 provisional). **A summerised certificate from Chartered Accountant to that effect is to be attached.**
- e) And the bidder's company/ firm must have designed, manufactured, tested and commissioned minimum 500 nos of solar PV pumps (ac/dc/surface/submersible) in any of government departments/ PSU/ Public Institutions in the country during last 3 years (Copy of the **certificates only and no other documents** from the authorized / designated public officer should be furnished in table below ).

Sl no	Name of govt /public user agency	Name of scheme / year	No of pumps installed	Certificates attached

- f) Max. of 10% of the tendered quantity shall be considered for **local registered small and medium entrepreneurs** subject to their meeting all specifications and terms / conditions (except the experience and turnover) and the respective model matching the L1 price. **The price quoted by the firm less than the L1 price of the main category will not consider.**
- g) The firm must not have been debarred / blacklisted / defaulted by any Govt. Dept, agency, PSUs / institution / agencies / autonomous organisations. A self-certificate by an authorized person of the bidder's company/firm is to be attached.

### 3. INSTRUCTIONS TO BIDDERS

**Intending bidders are requested to carefully study the instructions contained hereunder before preparing their bid documents for submission.**

1. A Bidder shall submit a single offer-bid only. The bidders shall be responsible for properly uploading the relevant documents in the e-tender portal in the specified location and Tender Inviting Authority shall not be held liable for errors or omissions done while uploading the online bid.
2. Bidders must submit their bids for relevant items as stated in this bid document.
3. Demand Drafts towards cost of document and EMD should be submitted in a separate envelop placed inside the envelope containing the technical bid.
4. Bids must be submitted in English language only.
5. Incomplete, telegraphic or conditional bids shall not be accepted.
6. Prices quoted must be firm and fixed. No price variation / escalation shall be allowed during process of completion of the project or for a period of one financial year whichever is earlier except the statutory government revision.
7. The bidders must sign at the bottom of each page of the bid documents at the time of submission in token of unconditional acceptance of the departmental terms and conditions, technical specifications etc.
8. Valid Tax return submission document duly attested must be submitted along with the bid. **All rules and circulars of Govt of Odisha issued from time to time will be applicable during project period from issue of tender to the completion of 5 years CMC period.**
9. Deviations in terms and conditions, Specification of material, Inspection clause etc. will not be accepted under any condition.
10. The bidder shall submit copies of documents defining the constitution or legal status, place of registration and principle place of business of company or firm.
11. The bidder shall furnish a brief write up backed with adequate data, explaining capacity and experience (both technical and commercial) for the

manufacture and supply of the required systems, equipments within the specified time of completion after meeting all their commitments.

12. Hard copies of Bids received late due to postal delay or otherwise will not be considered.

**13. The bidders are required to furnish their offers in the price bid both in words and figure in online only**

14. Since timely execution of supply / installations is of paramount importance, requests for extension of time shall not be ordinarily entertained.

15. Canvassing in any manner shall not be entertained and will be viewed seriously leading to rejection of the bid.

16. Certificate to the effect that the systems to be supplied are indigenous & not fully imported must be furnished.

17. Power of attorney to sign the agreement on behalf of bidders & partnership deed articles, if any, should be enclosed along with original bid documents.

18. Notice inviting Tender, bid documents, prescribed Technical bid, price bid, terms & conditions will form the part of the tender.

19. All pages of the bid documents must be signed & sealed by the authorized person on behalf of the bidders.

20. Bids will be accepted & will be opened as per information mentioned in the notice-inviting tender. No receipt against submission of bid shall be issued by OREDA.

**21. A pre bid meeting will be convened on ----- in the conference hall of OREDA. After discussion, deliberation and written statement / suggestions of the representative, the final tender document revised and approved by the technical committee will be uploaded on the website replacing the previous one. Submission of document shall start thereafter.**

22. Any clarification on the technical specification and commercial terms and conditions may be clarified in writing from OREDA.

23. Deviation of any commercial terms and condition and technical specification shall not be entertained under any circumstances

24. Bidders may in their own interest visit the sites in order to develop a clear understanding of the logistics and other features of the sites before submitting bids and under taking may be attached in the tender document. OREDA will not be responsible for any incidental or consequential losses of the firms while execution and till expiry of the period of maintenance.

25. All the bidders shall essentially indicate the break-up of prices as shown in Price bid.

26.If qualified, the bidder must open a local office at Bhubaneswar before commencement of the supply / installation for coordination of all jobs and service centres fully equipped with technical person and spare parts at cluster level in the district where solar pumps installed. Such facility must have proper mailing address with contact person detail from time to time for all documents. **All supply / installation orders shall be placed with the state local registered office of the qualified empanelled bidders having valid Odisha Tax as per the FD circular no 5439 dtd 25.2.14, if applicable.**

27.On award of contract the qualified bidder shall be termed as executing agency.

29.Opening of the bids:

The procedure of opening of the bid shall be as under

- i) The technical bid opening is ONLINE. The date of opening of the technical bid is only published in advanced. The date of opening of the price bid will be decided after verification of those bidders who qualify in the technical bid evaluation and will be informed in advance.
- ii) The online opening of the technical bid and the price bid shall be done by the Chief Executive / or his authorised representative as per bid schedule. The prospective bidders can access to the online opening by logging in to the e-tender portal with the registered digital signature. Bidders / its authorised representative may not come to this office of OREDA for the opening of the technical or price bids.
- iii) In the event of the specified date for opening of the bids being declared holiday, the bid shall be opened at the appointed time and venue on the next working day.
- iv) In the event of the bid and claims in the online documents are materially missing or of substantial error or want of required qualifications, shall stand disqualified and rejected.

30. Evaluation of Bids

- i) The documents submitted as technical bids shall be scrutinized by a bid evaluation committee duly appointed.
- ii) The bid evaluation committee may also verify the veracity of claims in respect of the known performances of the items offered, the experience and reputation of bidder in the field. The Tender Inviting Authority, if required reserves the right to inspect the facility of the bidder for verification of information furnished in the bid.
- iii) The decisions of the bid evaluation committee is final on whether the bidders are responsive or non responsive as per the eligibility criteria set.
- iv) The verification of the items shall be conducted by the Technical Committee

in which the external experts from the user institutions / funding agency, whenever necessary.

- v) The decision of the technical committee will be intimated to the qualified bidders

### 31. Price bid opening

- i) The opening of the price bid of the technically qualified bidders shall be done online by the Tender Inviting Authority or the authorized representative and only the price bids in the proper format of the those firms qualified in the evaluation of the technical bids shall be opened.
- ii) The lowest rate quoted in each category pump in proper format complete in all respect will be accepted except for those under local category.
- iii) As it will be preferential lowest rate contract with empanelled vendors no price preference is warranted.

### 32. Acceptance/ Rejection of the bid documents:

Chief Executive, OREDA reserves the right to reject or accept any bid or annul the bidding process at any time prior to award of contract, without having prejudice of incurring any liability to the affected bidders or any obligation to inform the bidders

Sd/dt.20.7.2017

**Chief Executive**

I/we have carefully read & understood the above terms & conditions of the bid & agree to abide by them.

**Signature and Seal of bidder**



#### 4. COMMERCIAL TERMS & CONDITIONS

The Chief Executive, OREDA shall award the contract to the successful bidders whose bids shall be qualified after evaluation in terms of the responsiveness and lowest rate determined on the basis of price bids. On receipt of the awarded work the same should be submitted duly signed by the authorised person on each page within 7 days duly endorsed by the respective Authorised Officer / Division and OREDA RE Cell Officials as acceptance of the terms and conditions. In case of non submission of the same duly complied the said award shall stand cancelled.

##### 4.1 **Rate:**

The offer should indicate the unit cost of the system, Installation & Commissioning charges, CMC and taxes & duties separately (Annexure E ). The unit cost must be inclusive of packing, forwarding, loading & unloading charges, cost of insurance and transportation FOR destination in the entire state where the system will be installed as per the supply / installation order.

##### 4.2 **Tax & Duties etc.:**

All statutory deductions applicable for the period of the project shall be effected

##### 4.3. **Earnest Money Deposit:**

4.3.1 Earnest money deposit Rs.10.00 lakh as specified in the Table above is required to be deposited along with the bid without which the bid will not be accepted. No interest will be payable for the EMD amount under any circumstances.

**4.3.2 An additional EMD of Rs.10.00 lakh shall have to be deposited in case L1 rate quoted is less than the prevalent MNRE bench mark cost of the respective category.**

4.3.3 Earnest money shall be submitted in shape of a Demand Draft in favour of Chief Executive, OREDA or BG valid for 120 days (Annexure-D1) from any Nationalised Bank Payable at Bhubaneswar and the proof of deposits should be attached to the bid. E.M.D would be refunded to the unsuccessful Bidders after finalization of the bid without any interest.

4.3.4 E. M. D would be forfeited in case of non- compliance of the purchase order by the successful bidders. **EMD submitted shall be returned to successful bidders only after Security cum Performance Bank Guarantee as work award is deposited.**

4.3.5 In case of claim for exemption from deposit of Earnest money sufficient proof in support of claim for exemption of EMD as prescribed in Govt. of India Notification is to be attached with the bid. **All benefits as per the State Govt policies will be applicable for local eligible firms only.**

#### **4.4 Security Deposit/ Performance Guarantee Fees:**

The successful bidders must deposit a **bank guarantee** (Annexure-D1) towards Security cum Performance Guarantee fees with the Chief Executive, OREDA, Bhubaneswar for the **feasible cases only along with acceptance of work order as follows**

**2% of the order value per year** in shape of irrevocable Bank Guarantees up to **5 years validity** from the date of supply, installation and commissioning till the completion of respective warranty and CMC period of the composite system.

The said deposit would be forfeited or BG invoked in part or full depending upon the significance of the performance or deficiency of services, if the supplies are not made and performances are not as per the Terms & Conditions of the purchase order. Every year the validity shall lapse with Warranty and CMC period discharged of the systems after commissioning of each system, subject to satisfactory execution / performance of the systems.

The solar module should be guaranteed on the performance as per the MNRE recommended technical specification. OREDA may at point of time get the performance test checked in any approved manner during period of guarantee. In case of deficiency of the same the whole lot of supply on that said order shall remain liable to be replaced. In case non adherence of quality, the executing agency shall be penalised suitably by the authority, besides, other measures of suspension, de-registration and blacklisting will be invoked.

**All benefits as per the State Govt policies will be applicable for local eligible firms only.**

#### **4.5 Programme Execution Schedule:**

The programme of execution of the supply, installation and commissioning shall be carried out as per the schedule given in the supply / installation order subject to issue of water yield test / layout documents by the respective Nodal Officer / Authorised Officer in phased manner. In case yield test / feasibility report are available at the time of issue of supply / installation order the entire job has to be completed within maximum 3 months of sites clearance reports from User / OREDA.

Execution of supply / installation shall be carried out in an approved manner as outlined in the technical specification or where not outlined, in accordance with the relevant Indian Standard Specification, to the reasonable satisfaction of the Authorized OREDA Officer.

4.5.1 Upon intimation about commissioning of the systems by the executing firm a joint inspection will be carried out by the representatives of the executing firm, OREDA and other officers of user agency /from Govt of Odisha / Govt. of India.

4.5.2 The issuance of a JCC shall, in no way relieve the executing firm of its responsibility for satisfactory operation of the solar pumping systems.

#### **4.6 Validity of offer:**

The price bid offer (Annexure-E ) must be kept valid minimum for a period of one year from the date of opening of the technical bid. No escalation clause except the admissible tax component under the period of consideration would be accepted, if any. The validity can be mutually extended for a suitable period, if situation demands, with all terms and conditions as per the tender.

- (i) If at any time during the said period the empanelled bidders enhance schedule of reduce the price of such offered items or sells such items to any other person / organization at a price lower than the price chargeable under the contract or include additional schedule of supply, the supplier shall forthwith notify such modification to OREDA.
- (ii) Any qualified firm violating to aforesaid conditions whenever noticed shall be delisted from the panel.
- (iii) The lowest price offered less than the latest valid MNRE bench mark cost for the same capacity shall be rejected and such bidder shall be disqualified subject to submission of additional equal EMD (bid security) amount.

#### **4.7 Tax return:**

The bidders must submit attested copy of valid up to date Tax clearance / tax return certificate along with the bid. The bid would not be considered without this document.

The original certificate would be produced at the time of opening of the bid, or, before issue of purchase order, if required.

#### **4.8 Warranty:**

The Supplier warrants that the Goods(as per the test report issued by authorized test centre) supplied under this Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that the Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except when the design and/or is required by the Purchaser's Specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in conditions prevailing in the country of final destination.

This warranty shall remain valid for the period as per MNRE norms after the Goods or any portion thereof as the case may be, have been delivered to and commissioned and accepted at the final destination indicated in the Contract.

The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall repair or replace the defective Goods or parts thereof, without cost to the Purchaser other than, where applicable, the cost of inland delivery of the repaired or replaced Goods or parts from the port of entry to the final destination.

If the Supplier, having been notified, fails to remedy the defect(s), the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

#### **4.9 Penalty and termination of contract:**

The systems shall be supplied, installed and commissioned within the scheduled time as mentioned in the supply / installation order. If the supplier fails to adhere to the schedule, OREDA shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 1% of the delivery price of the delayed goods or unperformed services for each week of delay until actual delivery or installation/commissioning up to a maximum deduction of 5% of the contract price for delayed goods or installation and commissioning. Once the maximum is reached (i.e 5 weeks of delay) OREDA may consider termination of the contract and forfeit the security deposit without prejudice to the other remedies of the contract.

If at any time during the performance of the Contract, the Supplier or its subtle executants(s) should encounter conditions impeding timely delivery of the Goods and performance of the Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of the Contract.

A delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of liquidated damages pursuant, unless an extension of time is agreed upon without the application of liquidated damages.

#### **4.10 Termination for Default**

The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or in part:

- 4.10.1 if the Supplier fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser; or
- 4.10.2 if the Supplier fails to perform any other obligation(s) under the Contract.
- 4.10.3 If the supplier, in the judgement of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

For the purpose of this clause:

“Corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. “fraudulent practice” means a misrepresentation of

facts in order to influence a procurement process or the execution of a contract to the detriment of the borrower, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the borrower of the benefits of free and open competition.

In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.

#### **4.11 Inspection:**

Pre delivery inspection of major components may be carried out by a team of designated officials of OREDA, any other department as may be considered appropriate at the factory site of the vendor / manufacturer. Before despatch of consignment intimation shall be given sufficiently ahead so that no delay occurs for deputing officials and inspection at the premises / test site.

4.11.1 The rest of the tests and inspections shall be made at the place of delivery. Officers authorized by OREDA shall be entitled at all reasonable time to inspect and supervise and test during erection and commissioning. Such inspection will not relieve the executing firm of their obligation in the contract. The water output as per technical specification has to be guaranteed without any controversies of variation of water table.

4.11.2 OREDA shall have the right to have the tests carried out at its own cost by an independent agency at any point of time.

#### **4.12 Payment:**

Payment will be made in installment of solar water pumping system installed out of the total supply / installation order issued against the respective in the following manner

Total value of systems with full taxes / duties will be made after commissioning of the project. The check list of documents to be submitted along with the bills and Security cum Performance Bank Guarantee for release will be as per the purchase order issued.

For processing of the payment the indicative documents are to be submitted like all technical detail of the installed system, location map of the System, GPS based photograph wherever available of the solar PV pumping, System handing over report, Warranty certificate, Joint commissioning certificate or any other documents as may be required as per work award.

#### **4.13 Allocation of award & Execution:**

All supply / installation orders shall be placed with the state local registered office of the qualified empanelled bidders having valid Odisha TIN/ OVAT as per the FD circular no 5439 dtd 25.2.14 as long as applicable.

Minimum 30 % total allocation of work will be awarded to the lowest evaluated responsive bid (L1). However, the firm work order will be placed on availability and feasibility of sites and subsequent performance of the firm.

In case L1 rate being quoted by more than one bidder, the work to be executed shall be equally divided among them.

In case L1 bidder fails to execute the work adhering to conditions of the work order, L2, L3(in that order) may be asked to execute the work if they match the L1 rate with the matching capacity package.

In view of large geographical spread and expeditious completion of the project, it is imperative that there shall be multiple vendors subject to their acceptance to the L1 price discovered in the tender for the bidders other than the local category. **Successful bidders willing to accept the L1 price may be duly empanelled and arranged in order of their quoted price up to 10<sup>th</sup> bidder. Allocation of work award shall be as per the order and the overall execution performance.**

#### **4.14 Comprehensive Maintenance Contract:**

CMC will be applicable during the period of the warranty period of 5 years. The bidder must enter / submit into a Comprehensive maintenance contract for the specified period at the time of execution of the order. Offer without such CMC shall not be considered (sample format of CMC enclosed at Annexure). The scope of CMC must cover supply of all spare parts, services and performance reports during the contract in force. Order shall be placed on bidders who agree to offer such CMC. **No payment for the guarantee & AMC will be paid. This is linked to the performance guarantee fees in shape of BG which will lapse @ 2% each year for 5 years for successful functioning unless otherwise invoked by the authority full or part.**

#### **4.15 Limitation of Liability:**

OREDA, will, in no case be responsible for any accident fatal or non-fatal, caused to any worker or outsider in course of transport or execution of supply / installation. All safety measures as per prevailing norms should be adopted. All the expenditure including treatment or compensation will be entirely borne by the Executants as per statutory Govt policies. The Executants shall also be responsible for any claims of the workers including PF, Gratuity, ESI & other legal obligations. The executants shall take all steps towards the security compliances.

#### **4.16 Force Majeure:**

In no event shall either Party have any liability for failure to comply with this Agreement, if such failure results directly from the occurrence of any contingency beyond the reasonable control of the Party, including, without limitation, strike or other labor disturbance, riot, major power failure, war, natural calamities including but not limited to floods, earthquakes, fire, volcanic eruptions, epidemics, National Emergency, interference by any government or governmental agency, embargo, seizure, or enactment or abolition of any law, statute, ordinance, rule, or regulation (each a " Force Majeure Event"). In the event that either Party is unable to perform any of its obligations under this Agreement because of a Force Majeure Event, the Party who has been so affected shall as soon as may be, after coming to know of the Force Majeure Event, inform the other Party and shall take reasonable steps to resume performance as soon as may be after the cessation of the Force Majeure Event. If the period of nonperformance due to a Force Majeure Event exceeds thirty (30) days, the Party whose ability to perform has been so affected may, by giving written notice, terminate this Agreement.

#### **4.17 Dispute:**

If any dispute of any kind whatsoever arise between Nodal Agency and the vendor in connection with or arising out of the work award including without prejudice to the generality of foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent.

For adjudication of any dispute between OREDA and the bidders arising in this case, reference can be made to any Law courts under the jurisdiction of Odisha High court only.

The Chief Executive, OREDA reserves the right to accept or reject any or all bids without assigning any reason thereof.

Sd/dt.20.7.2017

**Chief Executive**

I/We have carefully read and understood the above terms and conditions of the bid and agree to abide by them.

**Signature of the bidder with Seal**

**TECHNICAL SPECIFICATION**

**SOLAR PHOTOVOLTAIC WATER PUMPING SYSTEMS**

**For MICRO PUMPING Applications (0.5 HP)**

**I. INTRODUCTION:**

A Solar Photovoltaic (SPV) Water Pumping System consists of:

- PV Array :  
Capacity of **500Wp**.

*These ranges of Solar Photovoltaic (SPV) Water Pumping Systems are basically for “MICRO PUMPING” applications. However, these may also be used for “Drinking Water Applications wherever such capacities are required”.*

PV Array should be mounted on a suitable structure with a provision for manual tracking.

- Motor Pump Set (Surface or submersible) :

It could be installed on a suitable bore-well, open well, Water Reservoir, Water stream, etc. It could be:

- D.C. Motor Pump Set (with Brushes or Brush less D.C.)  
OR
- A.C. Induction Motor Pump Set with a suitable Inverter

- Electronics :

- Inverter for A.C. Motors (Appropriate Electronic Controller in case of B.L.D.C. motors)
- Electronic Protections.

- Interconnect Cables and
- “On-Off” switch.

**II. PERFORMANCE SPECIFICATIONS AND REQUIREMENTS**

Solar PV Water Pumps with PV Panel capacity of 500 Wp may be installed on a suitable bore-well / open well / Water Reservoir / Water stream etc.



## **FOR 0.5 hp Motor Pump Set and 500 Wp Solar Panel:**

Under the “Average Daily Solar Radiation” condition of 7.15 KWh / sq.m. on the surface of PV array (i.e. coplanar with the PV Modules), the minimum water output from a Solar PV Water Pumping System at different “Total Dynamic Heads” should be as specified below :

- (i) Minimum 20, 000 liters of water per day from a Total Dynamic Head of 10 metres and the shut off head being at least 12 metres.
- (ii) Minimum 10, 000 liters of water per day from a Total Dynamic Head of 20 metres and the shut off head being at least 30 metres.
- (iii) Minimum 6000 liters of water per day from a Total Dynamic Head of 30 metres and the shut off head being at least 45 metres.

The actual duration of pumping of water on a particular day and the quantity of water pumped could vary depending on the solar intensity, location, season, etc.

Indicative performance specifications for the Shallow and Deep well SPV Water Pumping Systems are given in the Annexure II.

### **III. PV ARRAY**

The SPV water pumping system should be operated with a PV array capacity of **500 Watts peak**, measured under Standard Test Conditions (STC). Sufficient number of modules in series and parallel could be used to obtain the required PV array power output. The power output of individual PV modules used in the PV array, under STC, should be a minimum of 75 Watts peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred.

Indigenously produced PV module (s) containing mono/ multi crystalline silicon solar cells should be used in the PV array for the SPV Water Pumping systems.

- Modules supplied with the SPV water pumping systems should have certificate as per IEC 61215 specifications or equivalent National or International/ Standards.
- Modules must qualify to IEC 61730 Part I and II for safety qualification testing.
- The efficiency of the PV modules should be minimum 14% and fill factor should be more than 70%.
- The terminal box on the module should have a provision for

- “Opening” for replacing the cable, if required.
- There should be a Name Plate fixed inside the module which will give:
  - a. **Name of the Manufacturer or Distinctive Logo.**
  - b. **Model Number**
  - c. **Serial Number**
  - d. **Year of manufacture**
  - e. **Made in India (Subscribe in**

#### words) IV **MOTOR PUMP-SET**

- The SPV water pumping systems may use any of the following types of motor pump sets:
  - a. Surface mounted motor pump-set
  - b. Submersible motor pump set
  - c. Floating motor pump set
  - d. Pressure booster pumps
  - e. Any other type of motor pump set after approval from Test Centers of the Ministry.
- The “Motor Pump Set” should have a capacity of **0.5 hp and** should have the following features:
  - The mono block DC/ AC centrifugal motor pump set with the impeller mounted directly on the motor shaft and with appropriate mechanical seals which ensures zero leakage.
  - The motor of the capacity of 0.5 hp should be AC, DC BLDC type. The suction and delivery head will depend on the site specific condition of the field.
  - Submersible pumps or Surface pumps could also be used according to the dynamic head of the site at which the pump is to be used.
- It is recommended that all parts of the pump and the motor of the submersible pumps should be made of stainless steel or suitable grade of plastic. The impellers and other internal parts can be of suitable grade of modified PPE resins (example Noryl) or Polycarbonate or equivalent.
  - The manufacturers of pumps should self-certify that, the pump and **all external parts of motor used in submersible pump which are in contact with water, are of stainless steel or suitable grade of plastic.** The pumps used for solar application should have a 5 years warranty so it is essential that the construction of the pump be made using parts which have a

much higher durability and do not need replacement or corrode for at least 5 years.

- The following details should be marked indelibly on the motor pump set
  - a) Name of the Manufacturer or Distinctive Logo.
  - b) Model Number.
  - c) Serial Number.
- The suction/ delivery pipe (GI/HDPE), electric cables, floating assembly, civil work and other fittings required to install the Motor Pump set.

## V. MOUNTING STRUCTURES.

The PV modules should be mounted on metallic structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 200 km per hour. The support structure used in the pumping system should be hot dip galvanized iron with minimum 80 micron thickness.

To enhance the performance of SPV water pumping systems, manual or passive or auto tracking system **must** be used. For manual tracking, arrangement for seasonal tilt angle adjustment and three times manual tracking in a day should be provided.

## VI. ELECTRONICS AND PROTECTIONS

- Inverter could be used, if required, to operate an A.C. Pump. The inverter must have IP 54 protection or must be housed in a cabinet having at least **IP54** protection.
- Controller for BLDC motor driven pumps, if required may be used. The controller must have **IP 54** protection or must be housed in a cabinet having
- at least IP 54 protection.
- Adequate protections should be incorporated against dry operation of motor pump set, lightning, hails and storms.
- Full protection against open circuit, accidental short circuit and reverse polarity should be provided.

## VII. ON/OFF SWITCH

A good reliable switch suitable for DC use is to be provided. Sufficient length of cable should be provided for inter-connection of the PV array, Controller / Inverter and the motor pump set.

## VIII. WARRANTY

The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. The whole system including submersible/ surface pumps shall be warranted for 5 years. Required Spares for trouble free operation during the Warrantee period should be provided along with the system.

## IX. OPERATION AND MAINTENANCE MANUAL

An Operation and Maintenance Manual, in English and the local language, should be provided with the solar PV pumping system. The Manual should have information about solar energy, photovoltaic, modules, DC/AC motor pump set, tracking system, mounting structures, electronics and switches. It should also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Name and address of the person or Centre to be contacted in case of failure or complaint should also be provided. A warranty card for the modules and the motor pump set should also be provided to the beneficiary.

## X. NOTES

- The type of pump set used must match the total dynamic head requirement of the site (i.e. the location at which it is installed).
- There should not be any compulsion to use only one or the other type of Motor-pump set. The beneficiary may select an appropriate Model (i. e. Capacity of PV Array and Type of Motor Pump Set) as per site requirement.
- Solar Photovoltaic Water Pumping Systems should be tested and certified by an authorized test centre of the Ministry to meet the performance and water discharge norms specified in section II above.
- Variation in the modules wattage in the PV Array should be within + or - 3 % so as to minimize the mismatch losses in the PV Array.
- The capacity (i.e. overall wattage) of the PV Array submitted to the Test Centers should be within - 3% or + 5 % of the specified value. However, the capacity of the PV Array, supplied in the field could be more than the 5 % of the specified value (but not less than 3% of the specified value).

### **Indicative Technical Specifications of Solar ‘MICRO’ Pumping Systems:**

	Model-I	Model-II
PV array	500 Wp	500 Wp
Motor capacity	0.5 hp	0.5 hp
Shut Off Dynamic Head	12 metres	30 metres
Water output *	20,000 litres per day from a total head of 10 metres	10,000 litres per day from a total head of 20 metres
Type of Pump	Surface Pump	Submersible pump

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of **7.15 KWh/ sq.m. on the surface of PV array (i.e. coplanar with the PV Modules)**.

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
2. In case of a surface pump, the suction head to be limited to **6 metres**.

# **SOLAR PHOTOVOLTAIC WATER PUMPING SYSTEMS (1HP to 10HP)**

Ministry of New and Renewable Energy Jawaharlal Nehru  
National Solar Mission SOLAR PHOTOVOLTAIC WATER  
PUMPING SYSTEMS (2015-16)

## **I. INTRODUCTION**

A Solar Photovoltaic (SPV) Water Pumping System consists of:

Ñ PV Array :

*Capacity in the range of 200 Wp to 10 KWp. These ranges of Solar Photovoltaic (SPV) Water Pumping Systems are basically for “Irrigation” applications. However, these may also be used for “Drinking Water Applications wherever such capacities are required”.*

PV Array should be mounted on a suitable structure with a provision of tracking the sun.

- Motor Pump Set (Surface or submersible) :
  - D.C. Motor Pump Set (with Brushes or Brush less D.C.)
  - Or
  - A.C. Induction Motor Pump Set with a suitable Inverter
- Electronics :
  - Maximum Power Point Tracker (MPPT)
  - Inverter for A.C. Motors (Appropriate Electronic Controller in case of B.L.D.C.)
  - Electronic Protections.
- Interconnect Cables
- “On-Off” switch.

## **II. PERFORMANCE SPECIFICATIONS AND REQUIREMENTS**

Solar PV Water Pumps with PV module capacity in the range of 900 Watt to 9 KWp may be installed on a suitable bore-well / open well / Water Reservoir / Water stream etc.

Under the “Average Daily Solar Radiation” condition of 7.15 KWh / sq.m. on the surface of PV array (i.e. coplanar with the PV Modules), the minimum water output from a Solar PV Water Pumping System at different “Total Dynamic Heads” should be as specified below :

**For D.C. Motor Pump Set with Brush Less D.C.(B.L.D.C. ) :**

- (i) 100 liters of water per watt peak of PV array, from a Total Dynamic Head of 10 metres (Suction head, if applicable, minimum of 7 metres) and with the shut off head being at least 12 metres.
- (ii) **50** liters of water per watt peak of PV array, from a Total Dynamic Head of 20 metres (Suction head, if applicable, up to a maximum of 7 metres) and with the shut off head being at least 25 metres.
- (iii) 35 liters of water per watt peak of PV array, from a Total Dynamic Head of 30 metres and the shut off head being at least 45 metres.
- (iv) 21 liters of water per watt peak of PV array, from a Total Dynamic Head of 50 metres and the shut off head being at least 70 metres.
- (v) 14 liters of water per watt peak of PV array, from a Total Dynamic Head of 70 metres and the shut off head being at least 100 metres.
- (vi) 9.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 100 metres and the shut off head being at least 150 metres.

The actual duration of pumping of water on a particular day and the quantity of water pumped could vary depending on the solar intensity, location, season, etc.

Indicative performance specifications for the Shallow and Deep well SPV Water Pumping Systems are given in the Annexure I.

For A.C. Induction Motor Pump Set with a suitable Inverter:

- (i) 90 liters of water per watt peak of PV array, from a Total Dynamic Head of 10 meters (Suction head, if applicable, minimum of 7 meters) and with the shut off head being at least 12 meters.
- (ii) 45 liters of water per watt peak of PV array, from a Total Dynamic Head of 20 meters (Suction head, if applicable, up to a maximum of 7 meters) and with the shut off head being at least 25 meters.
- (iii) 32 liters of water per watt peak of PV array, from a Total Dynamic Head of 30 meters and the shut off head being at least 45 meters.\
- (iv) 19 liters of water per watt peak of PV array, from a Total Dynamic Head of 50 meters and the shut off head being at least 70 meters.
- (v) 13 liters of water per watt peak of PV array, from a Total Dynamic Head of 70 meters and the shut off head being at least 100 meters.
- (vi) 8.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 100 meters and the shut off head being at least 150 meters.

The actual duration of pumping of water on a particular day and the quantity of water pumped could vary depending on the solar intensity, location, season, etc. Indicative performance specifications for the Shallow and Deep well SPV Water Pumping Systems are given in the Annexure II (Part of Annexure).

### **III. PV ARRAY**

The SPV water pumping system should be operated with a PV array capacity in the range of **200 Watts peak to 10000 Watts peak**, measured under Standard Test Conditions (STC). Sufficient number of modules in series and parallel could be used to obtain the required PV array power output. The power output of individual PV modules used in the PV array, under STC, should be a minimum of 125 Watts peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred.

Indigenously produced PV module (s) containing mono/ multi crystalline silicon solar cells should be used in the PV array for the SPV Water Pumping systems.



- Modules supplied with the SPV water pumping systems should have certificate as per IEC 61215 specifications or equivalent National or International/ Standards.
- Modules must qualify to IEC 61730 Part I and II for safety qualification testing.
- The efficiency of the PV modules should be minimum 14% and fill factor should be more than 70%.
- The terminal box on the module should have a provision for “Opening” for replacing the cable, if required.
- There should be a Name Plate fixed inside the module which will give:
  - a. Name of the Manufacturer or Distinctive Logo.
  - b. Model Number
  - c. Serial Number
  - d. Year of manufacture

#### IV **MOTOR PUMP-SET**

- The SPV water pumping systems may use any of the following types of motor pump sets:
  - a. Surface mounted motor pump-set
  - b. Submersible motor pump set
- The “Motor Pump Set” should have a capacity in the range of ***0.2 hp to 10 hp and*** should have the following features:
  - The mono block DC/ AC centrifugal motor pump set with the impeller mounted directly on the motor shaft and with appropriate mechanical seals which ensures zero leakage.
  - The motor of the capacity ranging from 0.2 hp to 10 hp should be only AC/ BLDC type. The suction and delivery head will depend on the site specific condition of the field.
  - Submersible pumps could also be used according to the dynamic head of the site at which the pump is to be used.

- It is recommended that all parts of the pump and the motor of the submersible pumps should be made of stainless steel.
  - The manufacturers of pumps should self certify that, the pump and **all external parts of motor used in submersible pump which are in contact with water, are of stainless steel.** The pumps used for solar application should have a 5 years warranty so it is essential that the construction of the pump be made using parts which have a much higher durability and do not need replacement or corrode for at least 5 years.
- ***Provision for remote monitoring of the installed pumps must be made in the controllers or the inverters either through an integral arrangement or through an externally fitted arrangement. It should be possible to ascertain the daily water output, the power generated by the PV array, the UP TIME of the pump during the year, Number of days the pump was unused or under breakdown/repairs.***
- The following details should be marked indelibly on the motor pump set
  - a) Name of the Manufacturer or Distinctive Logo.
  - b) Model Number.
  - c) Serial Number.
- The suction/ delivery pipe (GI/HDPE), electric cables, floating assembly, civil work and other fittings required to install the Motor Pump set.

## **V. MOUNTING STRUCTURES and TRACKING SYSTEM.**

The PV modules should be mounted on metallic structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 200 km per hour. The support structure used in the pumping system should be hot dip galvanized iron with minimum 80 micron thickness.

To enhance the performance of SPV water pumping systems, manual or passive or auto tracking system **must** be used. For manual tracking, arrangement for seasonal tilt angle adjustment and three times manual tracking in a day should be provided.

## **VI. ELECTRONICS AND PROTECTIONS**

- Maximum Power Point Tracker (**MPPT**) should be included to optimally use the Solar panel and maximize the water discharge.
- Inverter could be used, if required, to operate an A.C. Pump. The inverter must have IP 54 protection or must be housed in a cabinet having at least **IP54** protection.
- Controller for BLDC motor driven pumps, if required be used. The controller must have **IP 54** protection or must be housed in a cabinet having at least IP 54 protection.
- Adequate protections should be incorporated against dry operation of motor pump set, lightning, hails and storms.
- Full protection against open circuit, accidental short circuit and reverse polarity should be provided.

## **VII. ON/OFF SWITCH**

A good reliable switch suitable for DC use is to be provided. Sufficient length of cable should be provided for inter-connection of the PV array, Controller / Inverter and the motor pump set.

## **VIII. WARRANTY**

The PV Modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. The whole system including submersible/ surface pumps shall be warranted for 5 years. Required Spares for trouble free operation during the Warrantee period should be provided along with the system.

## **IX. OPERATION AND MAINTENANCE MANUAL**

An Operation and Maintenance Manual, in English and the local language, should be provided with the solar PV pumping system. The Manual should have information about solar energy, photovoltaic, modules, DC/AC motor pump set, tracking system, mounting structures,

electronics and switches. It should also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Name and address of the person or Centre to be contacted in case of failure or complaint should also be provided. A warranty card for the modules and the motor pump set should also be provided to the beneficiary.

## ANNEXURE – I

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems , With D.C. Motor Pump Set with Brushes or Brush Less D.C.(B.L.D.C.)

Description	Model-I	Model-II	Model-III
PV array	900 W <sub>p</sub>	1800 W <sub>p</sub>	2700 W <sub>p</sub>
Motor capacity	1 hp	2 hp	3 hp
Shut Off Dynamic Head	12 metres	12 metres	25 metres
Water output *	90,000 litres per day from a total head of 10 metres	180,000 litres per day from a total head of 10 metres	135,000 litres per day from a total head of 20 metres

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of **7.15 KWh/ sq.m. on the surface of PV array (i.e. coplanar with the PV Modules).**

Notes:

1. Suction head, if applicable, minimum 7 metres.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
3. If submersible pumps are used in lieu of surface pumps, the water output must match that of the surface pumps as specified in this table.
4. Module mounting structure shall be MS hot dipped galvanised, with a facility of manual tracking at least three times a day.

## ANNEXURE – I (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems:

With D.C. Motor Pump Set with Brushes or Brush Less D.C.(B.L.D.C.)

Description	Model-I	Model-II	Model-III	Model-IV	Model-V	Model-VI	Model-VII	Model-VIII
PV array	1200 Wp	1800 Wp	3000 Wp	3000 Wp	3000 Wp	4800 Wp	4800 Wp	4800 Wp
Motor Capacity	1 hp submersible with controller	2 hp submersible with controller	3 hp submersible with controller	3 hp submersible with controller	3 hp submersible with controller	5 hp Submersible with controller	5 hp Submersible with controller	5 hp Submersible with controller
Shut Off Dynamic Head	45 metres	45 metres	45 metres	75 metres	100 metres	70 metres	100 metres	150 metres
Water output*	42,000 litres per day from a total head of 30 metres	63,000 litres per day from a total head of 30 metres	105,000 litres per day from a total head of 30 metres	63,000 litres per day from a total head of 50 metres	42,000 litres per day from a total head of 70 metres	100,800 litres per day from a total head of 50 metres	67,200 litres per day from a total head of 70 metres	45,600 litres per day from a total head of 100 metres

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of **7.15 KWh/ sq.m. on the surface of PV array (i.e. coplanar with the PV Modules).**

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause-II. (i.e. performance specifications and requirements) specified earlier.
2. If surface pumps are used in lieu of submersible pumps, the water output must match that of the submersible pumps as specified in this table.
3. Module mounting structure shall be MS hot dipped galvanised, with a facility of manual tracking at least three times a day.

## ANNEXURE – I (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping

Systems:

With D.C. Motor Pump Set with Brushes or Brush Less D.C.(B.L.D.C.) (Contd.):

Description	Model-IX	Model-X	Model-XI	Model-XII	Model-XIII	Model-XIV
PV array (minimum)	6750 Wp	6750 Wp	6750 Wp	9,000 Wp	9,000 Wp	9,000 Wp
Motor capacity	7.5 hp Submersible with controller	7.5 hp Submersible with controller	7.5 hp Submersible with controller	10 hp Submersible with controller	10 hp Submersible with controller	10 hp Submersible with controller
Shut Off Dynamic Head	70 metres	100 metres	150 metres	70 metres	100 metres	150 metres
Water output*	141,750 litres per day from a total head of 50 metres	94,500 litres per day from a total head of 70 metres	64,125 litres per day from a total head of 100 metres	189,000litres per day from a total head of 50 metres	126,000 litres per day from a total head of 70 metres	85,500 litres per day from a total head of 100 metres

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of **7.15 KWh/ sq.m. on the surface of PV array (i.e. coplanar with the PV Modules)**.

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
2. If surface pumps are used in lieu of submersible pumps, the water output must match that of the submersible pumps as specified in this table.
3. Module mounting structure shall be MS hot dipped galvanised, with a facility of manual tracking at least three times a day.

## ANNEXURE – II

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems, With A.C. Induction Motor Pump Set and a suitable Inverter:

Description	Model-I	Model-II	Model-III	Model-IV	Model-V	Model-VI
PV array	900 Wp	1800 Wp	2700 Wp	2700 Wp	4800 Wp	4800 Wp
Motor capacity	1 hp	2 hp	3 hp	3 hp	5 hp	5 hp
Shut Off Dynamic Head	12 meters	15 meters	15metres	25 meters	15metres	30 meters
Water output *	81,000 liters per day from a total head of 10 meters	162,000 liters per day from a total head of 10 meters	243,000 liters per day from a total head of 10 meters	121,500 liters per day from a total head of 20 meters	432,000 liters per day from a total head of 10 meters	216,000 liters per day from a total head of 20 meters

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of 7.15 KWh/ sq.m. on the surface of PV array (i.e. coplanar with the PV Modules).

Notes:

1. Suction head, if applicable, minimum 7 meters.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
3. If submersible pumps are used in lieu of surface pumps, the water output must match that of the surface pumps as specified in this table.
4. Module mounting structure shall be MS hot dipped galvanized, with a facility of manual tracking at least three times a day.



## ANNEXURE – II(CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems:

With A.C. Induction Motor Pump Set and a suitable Inverter:

Description	Model-I	Model-II	Model-III	Model-IV	Model-V	Model-VI	Model-VII	Model-VIII
PV array	1200 Wp	1800 Wp	3000 Wp	3000 Wp	3000 Wp	4800 Wp	4800 Wp	4800 Wp
Motor capacity	1 hp submersible with controller	2 hp submersible with controller	3 hp submersible with controller	3 hp submersible with controller	3 hp submersible with controller	5 hp submersible with controller	5 hp submersible with controller	5 hp submersible with controller
Shut Off Dynamic Head	45 meters	45 meters	45 meters	75 meters	100 meters	70 meters	100 meters	150 meters
Water output*	38,400 liters per day from a total head of 30 meters	57,600 liters per day from a total head of 30 meters	96,000 liters per day from a total head of 30 meters	57,000 liters per day from a total head of 50 meters	39,000 liters per day from a total head of 70 meters	91,200 liters per day from a total head of 50 meters	62,400 liters per day from a total head of 70 meters	40,800 liters per day from a total head of 100 meters

\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of 7.15 KWh/ Esq. on the surface of PV array (i.e. coplanar with the PV Modules).

Notes

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
2. If surface pumps are used in lieu of submersible pumps, the water output must match that of the submersible pumps as specified in this table.
3. Module mounting structure shall be MS hot dipped galvanized, with a facility of manual tracking at least three times a day.

## ANNEXURE –II (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping

Systems: With A.C. Induction Motor Pump Set and a suitable Inverter (Contd.):

Description	Model-IX	Model-X	Model-XI	Model-XII	Model-XIII	Model-XIV
PV array(minimum)	6750 Wp	6750 Wp	6750 Wp	9,000 Wp	9,000 Wp	9,000 Wp
Motor capacity	7.5 hp	7.5 hp	7.5 hp	10 hp	10 hp	10 hp
Shut Off Dynamic Head	70 meters	100 meters	150 meters	70 meters	100 meters	150 meters
Water output*	128,250 liters per day from a total head of 50 meters	87,750 liters per day from a total head of 70 meters	57,375 liters per day from a total head of 100 meters	171,000 liters per day from a total head of 50 meters	117,000 liters per day from a total head of 70 meters	76,500 liters per day from a total head of 100 meters

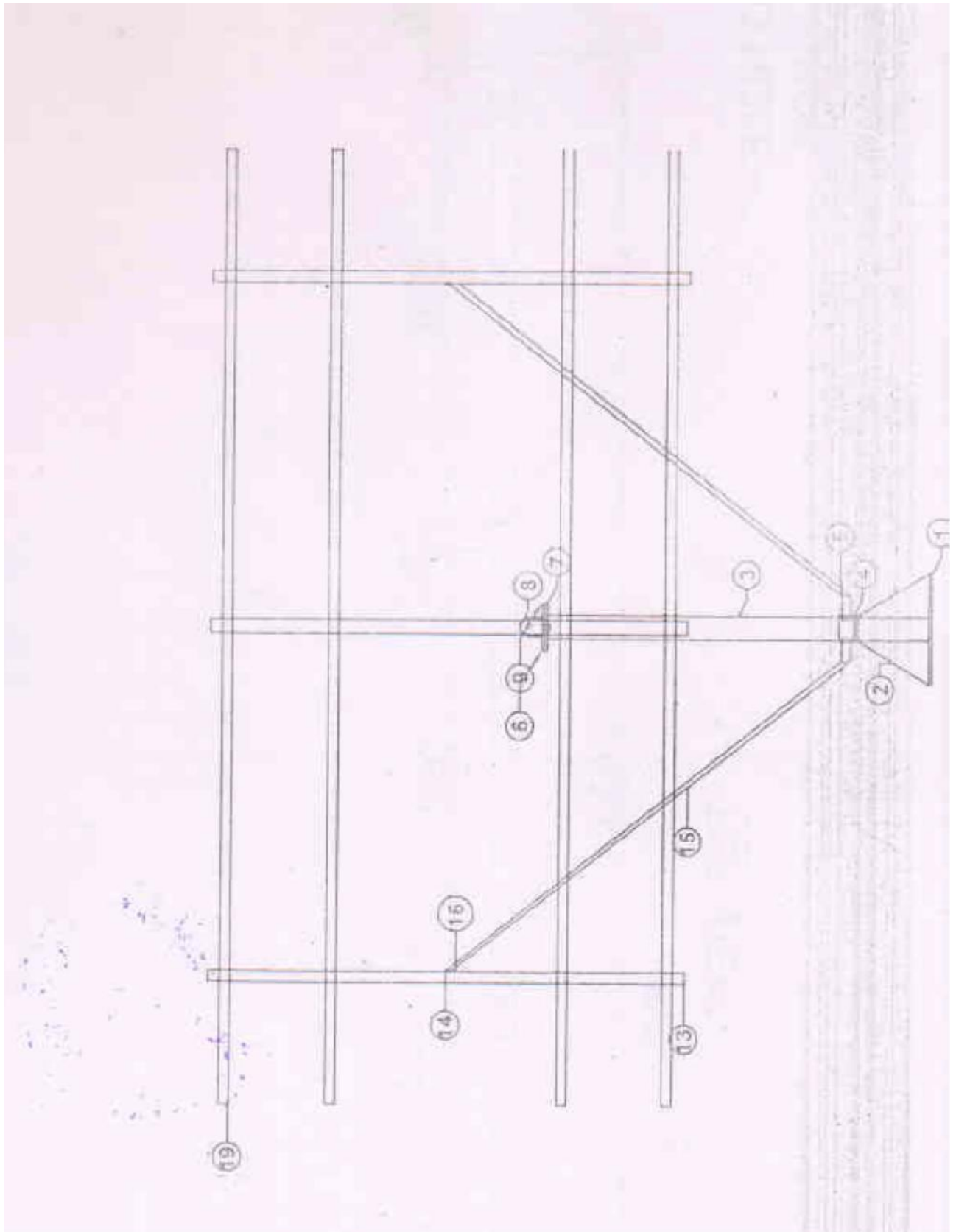
\* Water output figures are on a clear sunny day with three times tracking of SPV panel, under the “Average Daily Solar Radiation” condition of 7.15 KWh/sq.m. on the surface of PV array (i.e. coplanar with the PV Modules).

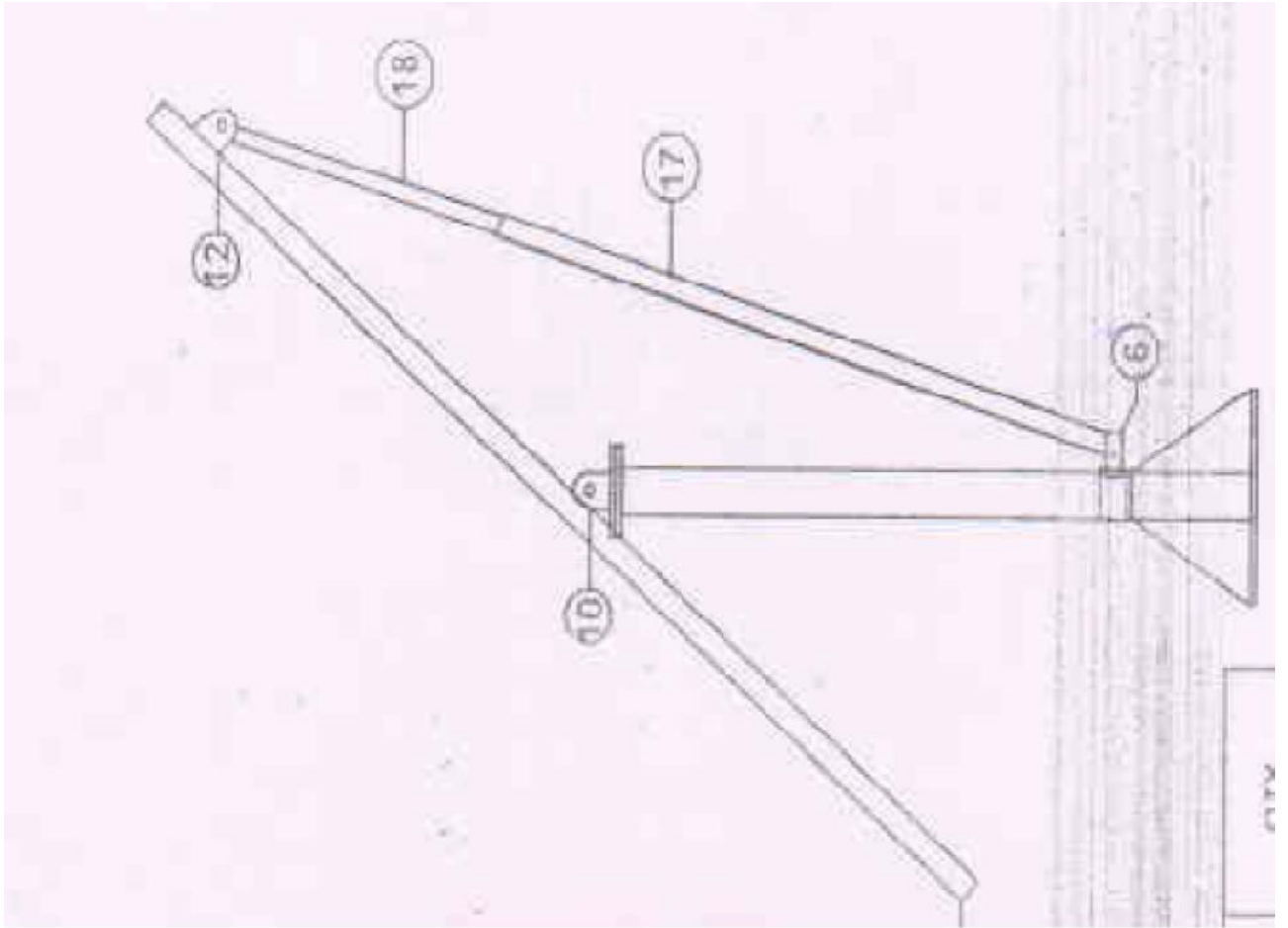
Notes:

- 1) For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause II. (i.e. performance specifications and requirements) specified earlier.
- 2) If surface pumps are used in lieu of submersible pumps, the water output must match that of the submersible pumps as specified in this table.

**Module mounting structure shall be MS hot dipped galvanized, with a facility of manual tracking at least three times a day.**

## Template Module Mounting Structure, bi-directional manual tracking provision







## ANNEXURE-C

### **Warranty –cum-Comprehensive maintenance of Solar Pumping Systems for a period of 5 years ( in Non-Judicial Stamp Paper of Rs-----)**

All materials, components of the Solar Pumping System during the period of maintenance shall be the property of Village Committee / user's authorised person where the system is installed.

This Warranty applies to the items / goods manufactured and supplied by the "The executants" consisting of pump set, controller, solar panels and accessories as per the format.

The "Company" warrants the solar water pumping system only against manufacturing defects. Faulty materials &/or workmanship for a period of 5 years from the date of commissioning.

Within the warranty period "The executants" undertakes to repair or replace any part/component found to be having manufacturing defects or unserviceable immediately upon its knowledge. "The executants" shall be under no obligation under this warranty, if the company is satisfied that the defects are due to improper usage, negligence, any modifications / alterations or tampering, accident, act of god or installation / repairs carried out by any person not duly authorized by "The executants" or by any reason beyond the control of "The executants" such as theft, war, earthquake, flood or storm & such other natural calamities like hailstorm, typhoon or cyclone uprooting of trees or electric poles, wire & radio or T.V. Antennas etc. causing accident damage to the system.

Under the warranty, no responsibility is accepted for any consequential loss or damage caused by any defect due to tampering to the system.

Any part, component or system replacement shall be granted in exchange of the defective part, component or system to the company by.

This warranty in no case shall extend to payment of any monetary consideration or compensation.

----- (hereinafter referred as "The executant") offers warranty of the Solar water pumping system as under:

This warranty excludes any damage inflicted by animals such as monkeys, domestic animals, birds or any creatures or miscreants.

This warranty excludes damages to the pump / motor due to foreign material like sand, clay coming along with water or due to collapse of bore well / tube well formation.

Regular maintenance of the all Systems for a period of 5 years of warranty against manufacturing defects after commissioning along with supply of consumable items as and when necessary and submission of daily performance of solar submersible pump systems shall come, under the comprehensive maintenance contract.

The break down maintenance of the entire system including supply of necessary spare parts, if any are already under the coverage of warranty clause of the General Terms & Condition and special terms & condition for a period of 5 years from date of commissioning of solar pumping systems. The operation and maintenance schedule of the SPV solar pumping systems during the 5 years contract period shall be as detailed below.

1. 5 years comprehensive maintenance period shall begin on the date actual commissioning for the solar pumping systems. The requisite numbers of qualified and trained personnel are required to be deputed / available in the state.
2. The security of the solar pumping systems will rest with the village committee/ user till such time comprehensive maintenance of the solar submersible pump systems.
3. The deputed personnel shall be qualified and well trained so that they can handle any type of operation hazard quickly and timely.
4. The deputed personnel shall have to keep the record on quarterly basis for the solar pump systems as per format to be supplied after commissioning of the solar submersible pump systems.
5. The deputed personnel shall be in a position to check and test all the equipment regularly, so that preventive actions, if any, could be taken well in advance to save any equipment from damage.
6. The Village Committee / user shall keep clean the solar pumping systems in all time.
7. Normal and preventive maintenance of all systems all electrical connection, changing of tilt angle of module mounting structure shall be the responsibility of the supplying agency.
8. During the maintenance period of 5 years of the solar all systems, if there is any defect of any component of all systems the supplier shall be responsible for immediate replacement / rectification. The damaged component may be repaired, if it is understood after examination that after repairing performance of the component shall not be degraded, otherwise the defective component shall have to be replaced by new one without any extra cost.
9. Comprehensive Maintenance Instructions:
  - 9.1 Proper maintenance of the systems shall be carried out by the executants during the maintenance period of 60 months with 6 monthly / annual review check up of systems and equipment in detail with purchaser.

9.2 Properly qualified and trained personnel well versed in maintenance of SPV systems and knowledge of computers with approval from purchaser shall be deployed at site for maintenance.

- Systems personnel shall be deputed on such basis so that a qualified / trained person with a minimum Technical qualification should be available at site always during the maintenance period.
- Supplier shall depute an engineer of their company for the maintenance of the systems who shall be fully responsible for the complete maintenance and optimum operation of the systems. The name and contact nos. of this engineer shall be notified to the purchaser for the purpose of contact, responsibility and correspondence with regard to all trouble shooting.
- Replacement & repair of damaged parts shall be carried out immediately during the maintenance period so as to ensure at least 95% uptime.
- Systems operation reports in a format prescribed (Management Information System) by the purchaser shall be furnished by the supplier on a weekly and monthly basis or as may be required.
- Systems shall be operated as per the standard practices to ensure proper safety measures.
- The supplier shall ensure replacement of worn out parts and component during the comprehensive maintenance period for which purpose the supplier shall carry and maintain minimum inventory of spares at the systems and its supply / installations.
- In case of delay in repair & maintenance and non-observance of schedule, the purchaser shall have the right to impose any penalties including forfeiture of performance security.
- In case of any fault, the fault must be removed within 2 days of receipt of the complaint, failing which a penalty of Rs.1,000/- per day shall be charged. In case of delay of more than 7 days OREDA may on its take up repair by any suitable method and the cost of the repair along with the penalty amount will be charged from the supplier to be paid or deducted from the performance security deposit by invoking the BG in part to the extent of the repair cost.

9.3 Routine, preventive, breakdown & Capital Maintenance :

- Routine and Preventive maintenance shall include such checks and maintenance activities quarterly / half yearly and yearly basis which are required to be carried out on all the components of the solar submersible pump systems to minimize breakdown and to ensure



smooth and trouble free running of the all systems. The supplier shall be responsible to carryout routine and preventive maintenance and replacement of each and every component/ equipment of the solar submersible pump systems and he shall provide all labour, materials, consumables etc. for routine and preventive maintenance of his own cost.

- Breakdown maintenance shall mean the maintenance activity including repairs and replacement of any component or equipment of the all systems which is not covered by routine and preventive maintenance and which is required to be carried out as a result of sudden failure / breakdown of that particular component or equipment while the systems is running. The supplier shall be responsible to carry out breakdown maintenance of each and every component of the solar pumping systems and he shall provide the required manpower, materials, consumables, components or equipment etc. for breakdown maintenance at his own cost irrespective of the reasons of the breakdown/ failure.
- Capital maintenance shall mean the major overhaul of any component or equipment of the solar pumping systems which is not covered by routine, preventive and breakdown maintenance which may become necessary on account of excessive wear & tear, aging which needs repair / replacement. The capital maintenance of solar pumping systems and all civil structures shall normally be planned to be carried out on an annual basis. For this purpose a joint inspection by the supplier and purchaser shall be carried out of all the major components of the solar submersible pump systems, about two months in advance of the annual maintenance period.

The decision of the purchaser shall be final and binding.

**Signature of the bidder**

**ANNEXURE-D (I)**

**Model Bank Guarantee Format for Performance Security**

[Ref Para 22(i1)]

To

WHEREAS----- (name and address of the supplier) (hereinafter called "the supplier") has undertaken. in pursuance of contract no----- dated----- to supply -----(description of goods and services) (herein after called "the contract")'

AND WHEREAS it has been -stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein, as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee;

NOW THEREFORE we hereby affirm that we, are guarantors and responsible to you on behalf of the supplier. up to a total as detailed below . (Amount of the guarantee in words and figures). and we undertake to pay you.

1. 1 year@ 2%, Valid from ----- to ----- Rs. -----
2. 2 years@2%, Valid from -----to ----- Rs-----
3. 3 Years@2%, Valid from -----to ----- Rs-----
4. 4 years@2%, Valid from ----- to ----- Rs. -----
5. 5 years@2%, Valid from -----to -----Rs.-----

Upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid. without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your- demanding the said debt from the supplier before presenting us with the demand.

We further agree that no change or addition to or other 'modification of the terms of the contract to be performed there under or of any of the contract documents -- which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change. Addition or modification.

This guarantee shall be valid as indicated above .

Our branch at \* (Name & Address of the \_\_\_\_ \* branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our----- \* branch a written claim or demand and received by us at our \_\_\_\_ \* branch on or before Dt.--- otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

(Signature of the authorized officer of the Bank)

Name and designation of the officer

Seal. name & address of the Bank and address of the Branch

**FORMAT FOR BANK GUARANTEE FOR EMD**

On stamp paper of requisite amount

B.G. No:.....

Whereas 'OREDA' has invited tender for the work of Design, supply, installation, commissioning and maintenance of SPV Systems vide Tender Call Notice No.-----/OREDA AND WHEREAS M/S. (Name and address of the firm), who having submitted their tender hereinafter referred to as the 'Tenderer' and have agreed to deposit to the 'OREDA' an amount of Rs..... (Rupees .....) as per the terms and conditions of the Tender Document AND WHEREAS the 'OREDA' also willing to accept a Bank guarantee in lieu of payment by demand draft of any amount equivalent to the amount of earnest money required to be deposited by the Tenderer to the 'OREDA' i.e. an amount equal to Rs..... which as guarantee will be kept valid up to -----.

In consideration of the 'OREDA' having agreed to consider the Bid proposals submitted by the tenderer without depositing the amount of earnest money and against this Bank guarantee, we .....(name and address of the bank) hereby undertake and guarantee to make payment to the 'OREDA' the amount of Bid earnest money deposit at any time (time being the essence of the contract) when the 'OREDA' asks for the same as per the terms and conditions of the tender Document.

The bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the 'OREDA' in writing and the guarantee shall be continuous and irrevocable guarantee up to a sum of Rs..... (Rupees.....)only provided always that any indulgence or relation on the part of the 'OREDA' to the said tenderer with or without the consent of the bank shall not prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defence by the Bank against the 'OREDA'.

In case the 'OREDA' Force puts forth a demand in writing on the Bank for the payment of amount full or in part against this bank guarantee, the bank will consider that such demand by itself is a conclusive evidence and proof that the tenderer has failed in complying with the terms and conditions stipulated by the 'OREDA' in its bids and payment will be made to the 'OREDA' without raising any disputes regarding the reasons for such failure on the part of the tenderer.

The bank shall not be discharged for release from this guarantee by any arrangement between the tenderer and the 'OREDA' with or without the consent of the bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the 'OREDA' to the tenderer.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the 'OREDA' may have or hereafter possess against the tenderer and the 'OREDA' shall be under no obligations to marshal in favour of the bank any such securities or fund or asset that the 'OREDA' at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any

security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the 'OREDA' on 'OREDA' serving a notice requiring the payment of the amount and such notice shall be served on the bank either by actual delivery thereof to the Bank or by dispatching thereof to the bank by Registered post at the address of the said Bank. Any notice sent to the Bank at its address by Registered Post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to the Bank.

In order to give full effect to the provisions of this guarantee the bank thereby waives all rights inconsistent with the above provisions and which the bank might otherwise as a guarantor be entitled to claim and enforce.

We,.....(name and address of the bank), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the 'OREDA' in writing.

“Notwithstanding anything contained herein”,

- (i) Our liability under this guarantee shall not exceed Rs..... (Rupees ..... only).
- (ii) This Bank Guarantee shall be valid up to -----
- (iii) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if we receive from you a written claim or demand on or before ----- (date of expiry of Guarantee)”.

Dated:-.... day of ..... 2016

**ANNEXURE- E**

**FORMAT FOR FINANCIAL OFFER FOR SUPPLY OF SOLAR PV PUMPING SYSTEM**

Sl No	Items	Model	PV array Minimum	Motor Capacity	For customer / users / farmers anywhere in the state <b>excluding taxes</b>		
					Supply	Installation	Total
1	Shallow Well ( <b>Surface</b> ) / floating Solar Pumping Systems, with D.C. Motor Pump Set with Brushes or Brush Less D.C. (B.L.D.C.)	Model-I	900Wp	1HP			
2		Model-II	1800Wp	2HP			
3		Model-III	2700Wp	3HP			
4	Solar Deep well ( <b>submersible</b> ) Pumping Systems with D.C. Motor Pump Set with Brushes or Brush Less D.C.(B.L.D.C.)	Model-I	1200Wp	1HP			
5		Model-II	1800Wp	2HP			
6		Model-III	3000Wp	3HP			
7		Model- IV	3000Wp	3HP			
8		Model- V	3000Wp	3Hp			
9		Model-VI	4800Wp	5HP			
10		Model-VII	4800Wp	5HP			
11		Model-VIII	4800Wp	5HP			
12		Model-IX	6750Wp	7.5HP			
13		Model-X	6750Wp	7.5HP			
14		Model-XI	6750Wp	7.5HP			
15		Model-XII	9000Wp	10HP			
16		Model-XIII	9000Wp	10HP			
17		Model-XIV	9000Wp	10HP			
18	Shallow Well ( <b>Surface</b> ) Solar Pumping Systems , With A.C. Induction Motor Pump Set	Model-I	900Wp	1HP			
19		Model-II	1800Wp	2HP			
20		Model-III	2700Wp	3HP			
21		Model- IV	2700Wp	3HP			
22		Model- V	4800Wp	5Hp			
23		Model-VI	4800Wp	5HP			
24	Solar Deep well ( <b>submersible</b> ) Pumping Systems: With A.C. Induction Motor Pump Set	Model-I	1200Wp	1HP			
25		Model-II	1800Wp	2HP			
26		Model-III	3000Wp	3HP			
27		Model- IV	3000Wp	3HP			
28		Model- V	3000Wp	3Hp			
29		Model-VI	4800Wp	5HP			
30		Model-VII	4800Wp	5HP			
31		Model-VIII	4800Wp	5HP			
32		Model-IX	6750Wp	7.5HP			
33		Model-X	6750Wp	7.5HP			
34		Model-XI	6750Wp	7.5HP			
35		Model-XII	9000Wp	10HP			
36		Model-XIII	9000Wp	10HP			
37		Model-XIV	9000Wp	10HP			
38	Micro pump <b>Surface</b> pump with Brushes or Brush Less D.C. (B.L.D.C.)	Model-I	500 Wp	0.5 HP			

Format of price schedule is a sample for the Bidder's. The bidder's are instructed to fill the rates in prescribed price schedule available on Portal. Price schedule should not be submitted in Technical Bid.

Signature if bidder with seal & date