

**OFFICE OF THE EXECUTIVE ENGINEER, P.H.E DIVISION**  
**LEH-LADAKH.**

Website: [www.leh.nic.in](http://www.leh.nic.in)  
Tel: 01982-252310 Fax: 09182-252310

**TENDER DOCUMENT:**

For

**RATES FOR SUPPLY, INSTALLATION, COMMISSIONING OF SOLAR  
SUBMERSIBLE PUMPS, STRICTLY AS PER THE SPECIFICATIONS OF THE P.H.E  
DIVISION, LEH**

- I. To be submitted by 2.00 P.M on or before 25 Aug 2010 in the office of the District Superintending Engineer, Leh
- II. To be opened at 3.00 P.M on 26 Aug 2010 in the office of the District Superintending Engineer, Leh
- III. Issued to:

M/s.

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(Tenderer)

Date of Issue of Tender: \_\_\_\_\_

Money Receipt No. \_\_\_\_\_ Date: \_\_\_\_\_

Amount: Rs. 2000/- Only

Sd-  
**Executive Engineer**  
**P.H.E Division, Leh**

**OFFICE OF THE EXECUTIVE ENGINEER, P.H.E DIVISION LEH-LADAKH.**

**NOTICE INVITING TENDER**

For and on behalf of the Governor of J&K, sealed tenders affixed with Rs.5/= revenue stamps are invited from reputed Solar Photo Voltaic (SPV) Module manufacturers for the supply and installation of 1800Wp Solar Submersible Pumps. The firm must have ISO 9001 and ISO 14001 certification, manufacturing facilities for SPV Modules in India & should have a service centre at Leh.

S.no	Particulars	Nos	Earnest Money	Cost of Tender Document	Issue of Tender Document	Last date for the Issue of Tender
<b>1.</b>	1800 Wp Solar Submersible Pumps	<b>17</b>	<b>Rs 2,04,000/-</b>	<b>Rs 2000</b>	<b>16 Aug 2010</b>	<b>23 Aug 2010</b>

Last date of submitting the sealed tender forms is **25-Aug-2010 till 2.00 p.m.** Opening of the tenders will be on **26-Aug-2010 at 3.00 p.m.**

**No:-**

**Dated:-**

**Executive Engineer/  
P.H.E Division, Leh**

Copy to:

- 1) P.A to Hon'ble Chief Executive Councilor, LAHDC Leh, for the information of Hon'ble CEC
- 2) Hon'ble Executive Councilor works for information
- 3) Chief Executive Officer, LAHDC, for information
- 4) Chief Controller of Finance, LAHDC, for information
- 5) District Superintending Engineer, PWD Circle, Leh
- 6) Technical Director, NIC, with the request to put the NIT on official website.
- 7) Assistant Director Information, Leh for info, and with the request to get the NIT published in leading national, state and in local dailies
- 8) Executive Engineer, R&B Division, Leh
- 9) Executive Engineer, Construction Division, Leh
- 10) Executive Engineer, Igo-Phey Division, Leh
- 11) Executive Engineer, I&FC Division, Leh
- 12) President Contractor Association, Leh
- 13) Notice Board Divisional Office, Leh
- 14) Main Bazar, Leh
- 15) Head Draftsman Divisional Office, Leh
- 16) Head Assistant Divisional Office, Leh
- 17) Camp Clerk

## CHECK LIST

To ensure that your tender submitted to Superintending Engineer, Leh is complete in all respects, please go through the following checklist & tick mark for the enclosures attached with your tender:

S. No.	Description	Attached	Not Attached
1	Earnest Money		
2	Tender Document Fee		
	The original document duly signed & sealed on each page, as a confirmation of acceptance of Terms & Conditions (T&C)		
4	A Copy of registration/CST/PAN & S.T. Clearance Certificate		
5	Details of similar work done in last three years along with copies of the orders and certificates from the customers, their address phone/fax as per the Tender Evaluation Criteria and of the tender.		
6	Details of technical staff available (Brief Bio data of key personnel be given) of the tender document.		
7	Technical details and specifications highlighting salient features of the system.		
8	Declaration of the supplier about any relatives working with P.H.E Division, Leh.		
9	Deviations, if any, from the specifications, terms & conditions etc.		
10	Whether validity of your tender is confirmed as per the document.		

**UNDERTAKING OF THE TENDERER**

I/We have read carefully and examined the Notice Inviting Tender, schedule, General Rules and terms and conditions of the contract, special conditions, Schedule of Rates and other documents and Rules referred to in the tender document for the supply.

I/We hereby tender my rates for the execution of the work for P.H.E Division, Leh as specified within the time stipulated in the schedule in accordance with all aspects with the specifications, designs, drawings and instructions with such conditions so far as applicable.

I/We agree to keep the tender open for One Year from the due date of submission thereof and not to make any modifications in its terms, conditions and rates.

A sum of Rs. 2,04,000 as earnest money in favour of District Superintending Engineer PWD circle leh and Rs. 2000/- as document fee in favour of Executive Engineer P.H.E Division, Leh, respectively are forwarded in form of crossed Demand Draft. If I/We, fail to commence or complete the work ordered in specified time I/We agree that the P.H.E Division, Leh shall, without prejudice to any other right or remedy, be at liberty to forfeit the said Earnest Money absolutely. The said Earnest Money shall be retained by P.H.E Division, Leh towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be required by P.H.E Division, Leh.

I/We hereby declare that I/We shall treat the tender documents, specifications and other records connected with the work 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 prejudicial to the safety of P.H.E Division, Leh.

I/We shall abide to all the laws and shall be responsible for making payments of all the taxes, duties, levies and other Govt. dues etc. to the appropriate Govt. departments. Our state sales tax registration No. is \_\_\_\_\_ and CST Registration No. is \_\_\_\_\_

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

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 P.H.E Division, Leh to recover the taxes due from us and deposit the same with the appropriate authorities on their demand. **I also agree to not to claim any amount in advance before completing the work as per terms and conditions of tender.**

Dated:

Signature

Place:  
Witness

Name of Tenderer with seal

Signature:

Name:  
Postal Address:

**TENDER FORM**

The undersigned hereby tender and offer (subject to the Agency's conditions of tendering) to the P.H.E Division, Leh to supply, installation, commissioning of 1800 Wp Solar Submersible Pumps as per specifications of P.H.E Division, Leh and works which are described or referred to in the Details of Technical Particulars attached to tender document and its enclosure and in Schedules to the side. Details of Technical Particulars, copies of which are annexed here to and which under the terms there of are to be supplied, executed and done by the contractor and to perform and observe the provisions and agreements or the part of the contract contained in or reasonable to be referred from the said tender documents for the same and at the rates sets out in Schedule-I annexed hereto.

The complete tender document is also enclosed herewith duly signed on every page by the undersigned.

Signed this ..... day of ..... 2010.

Yours Faithfully,

TENDERER'S SIGNATURE  
(With seal)

TENDERER'S ADDRESS

## **PART I – TECHNICAL BID**

### **1. List of Locations for Installation**

<i>Sl. No.</i>	<i>Name of Village/Institution</i>	<i>Type of Institution</i>	<i>Type of Pump</i>	<i>Distance from Leh (km)</i>	<i>Head (m)</i>
1	Khaltsi Residential School	Educational	Submersible	100	66
2	Kargyam Satho Residential School	Educational	Submersible	144	39
3	Nyoma Residential School	Educational	Submersible	183	60
4	Diskit (Nubra) Tsogtat Higher Secondary School/Hostel	Educational	Submersible	100	36
5	Wanla Residential School/Hostel	Educational	Submersible	120	45
6	SNM Hospital, Leh	Medical	Submersible	In Leh	60
7	CHC Skurbuchan	Medical	Submersible	150	66
8	PHC Tangste	Medical	Submersible	120	60
9	PHC Nyoma	Medical	Submersible	183	60
10	PHC Chuchot	Medical	Submersible	15	40
11	SDH Diskit	Medical	Submersible	100	55
12	Korzok A. Dispensary	Medical	Submersible	230	45
13	Hanu A. Dispensary	Medical	Submersible	180	40
14	Sakti Sharnyos	Water Supply Scheme	Submersible	45	60
15	Hanlay Buk	Water Supply Scheme	Submersible	280	70
16	Yangthang	Water Supply Scheme	Submersible	60	70
17	Rumste	Water Supply Scheme	Submersible	90	65

**The head shown against each is tentative and may vary by +/- 20% as per the actual depth at which underground water is available in the borewell**

### **2. Minimum Criteria for Bidding**

The bidder must have following minimum criterion for bidding:

- a. The bidder must have ISO 9001 certification for quality management systems.
- b. The bidder must have ISO 14001 certification for environmental requirements.
- c. The bidder must ensure that the motor pump set manufacturer has ISO 9001 certification.
- d. The bidder must have annual turnover of Rs. 500 million in last financial year and 50% of the turnover must be from Solar Photo-Voltaics.

- e. The bidder must have solar module manufacturing facility in India and offered modules should be manufactured in accordance with IEC 61215 Edition II for meeting quality standards of crystalline silicon solar cell modules.
- f. The bidder must qualify to IEC 61730 (Part I and Part II) for safety qualification testing.
- g. The bidder must have experience of supplying, installing and commissioning solar surface and submersible pumps for more than 2 years in India.
- h. The bidder must have his service centre in Leh.
- i. The bidder must be a total integrated system designer of the solar pump, inclusive of solar modules, controller, junction boxes, and mounting structures.
- j. Company authorized dealers or agencies shall not be allowed to participate in the tender.

### **3. Experience of the Bidder**

A comprehensive list of past projects implemented, by the bidder in India or abroad, indicating clients, dates, size of projects and any other relevant material should be included in the offer. Companies having experience in execution of similar system in Indian states, especially in Leh and Kargil district will be given preference during technical evaluation.

### **4. INSTRUCTIONS, TERMS AND CONDITIONS:**

1. The tender should be in three parts viz. Part I, Part II and Part III as described in Clause 2 below. These should be in separate envelopes duly super-scribed as Part I, Part II and Part III, NIT No. and due date. Sealed envelopes containing all the three parts should then be placed in a larger envelope, which should be sealed, and super-scribed by the given NIT No., due date and name of the tenderer.

#### **Clause 2**

2. **PART I:** - Part I of the tender should be super-scribed as “***Part I, Technical Details for NIT No***” and should contain

#### **Technical Details:**

- a. The bidder ISO 9001 certificate to be enclosed
- b. The bidder ISO 14001 certificate to be enclosed
- c. The bidder must ensure that the motor pump set manufacturer has ISO 9001 certification; certification to be enclosed.
- d. The bidder must submit the undertaking/certificates for the materials to be supplied as per the Technical Specifications (Annexure 1).

- e. The bidder must have solar modules manufacturing facility in India and offered modules have been manufactured in accordance with IEC 61215 Edition II and IEC 61730 (Part I and Part II); necessary certificates to be enclosed.
  - f. The bidder must have PV modules tested at one of the IEC approved test centres. Test certificates to be enclosed.
  - g. The bidder must have his service centre in Leh; details of the service centre must be enclosed.
3. **PART II**: Part II of the tender should be super scribed as “***Part II, Commercial Bid for NIT No***” and should contain:
    - a. Proof of Earnest Money.
    - b. Income Tax Clearance Certificate.
    - c. Proof of annual turnover of Rs. 500 million in the last financial year and 50% from solar photo voltaic turnover
    - d. Demand Draft for the purchase of tender document
  4. ***PART III***: Part III of the tender should be super scribed as “***Part III, Price Bid for NIT No***” and should contain the price bid for the product as per the bill of material for each power plant, & strictly as per the price bid format given in the NIT. The price quoted should include the Maintenance contract for 3 years. The supplier has to quote clearly the F.O.R at the site of installation, inclusive of all taxes.
  5. The tender should be addressed to **The District Superintending Engineer, Leh**. Both inner and outer covers duly sealed and superscribed and sent either under registered cover or cast in the tender box kept in the office of the **The District Superintending Engineer, Leh**.
  6. The tenderer shall ensure timely receipt of tender in the office of the **The District Superintending Engineer, Leh**, the tenders received by hand or by post after due date of receipt of tenders shall not be entertained even if the tender has been posted/ dispatched much before the due date of receipt.
  7. The tenders will be opened on **26 Aug 2010** in the office of the **The District Superintending Engineer, Leh**, on the date of opening of the tenders only the technical and the commercial parts (part-I & part-II) shall be opened in the presence of the tenderers who may be present, the price bid (part-III) shall be opened only in case of such tenderers who on scrutiny of part-I & part-II of their offer are found to have qualified for opening of the price bid on the same day at the District Superintending Engineer’s office or any other day at the discretion of the purchasing committee. In case the due date of opening of the tenders falls on a holiday being declared subsequently, the tenders will be opened on the next working day.
  8. Tenders must be complete in all respects; all the terms and conditions of tender including the technical specifications should be carefully studied for the sake of submitting complete and comprehensive tender documents. Failure to comply with any of terms and conditions or instructions of the offer with insufficient particulars which are likely to render fair

comparison of tender as a whole impossible may lead to rejection even if otherwise it is a competitive offer/tender.

9. Telegraphic tenders or the tenders of such tenderers who have not purchased tender document shall not be entertained. Any request by post or by hand or telegraphically for any modification addition or deletion etc. in the tenders shall not be considered.
10. The tenders shall be prepared in a formal manner with all quotations written both in figures & words. The tenders shall be typed or written in ink, any tender written by pencil shall be rejected. There shall be no erasures or overwriting and if corrections are made the same shall be neatly done and attested. A systematic form of totalling shall be adopted to avoid any ambiguity. The detailed description of the equipment offered shall be given Rank charge, if any shall be debited to the account of the tenderer.
11. The tenderer shall furnish an affidavit duly attested by notary that design of their equipment is free from legal encumbrances and that no legal case of any kind of litigation regarding the patent design is pending in any court of law.
12. No tenderer unless otherwise specified in these specifications, terms and conditions shall be exempted from depositing earnest money.
13. The tenderer must have full-fledged service centre with all repairing facilities in Leh.
14. No claim shall be laid against the department either in respect of interest or depreciation in value for the amount of security deposit and or earnest money. In the case of bank deposits the department shall not be responsible for any loss on account of failure of the bank.

#### **5. SPECIAL INSTRUCTIONS:**

- a. Tenders not submitted on the lines indicated above are liable to be rejected without any correspondence.
- b. Request for extension in last date of receipts of tenders shall be ignored.
- c. The purchaser reserves the right to order additional quantity or reduce the quantity of the material advertised at the time of placement of order for which the quoted rate shall be valid.
- d. All legal proceedings in connection with the order, tender will be subject to the jurisdiction of local court of Jammu and Kashmir State alone.
- e. The purchaser reserves the right to divide the order between two or more tenders for 100% achievement.
- f. In case of any doubt, dispute or differences arising out of the contract, the same shall be referred to the Deputy Commissioner (LAHDC Leh) and Ladakh Affairs Department, J&K Government for the decision under J&K State Arbitration Act.
- g. The purchaser shall not be bound to accept the lowest or any tender and reserves to itself the right of accepting the whole or a portion of any of the tender, as it may deem fit, without assigning any reason thereof.
- h. Any form of canvassing by the tenderers to influence the consideration of their tender shall liable to summery rejection.
- i. In order to avoid delay caused by postal correspondence and to expedite the process, the purchaser may require the successful tenderer to hold technical & commercial negotiations and convey the decision/acceptance on behalf of the tenderer, with the Purchase Committee.

- j. The condition hereafter deal with systems details and supplementary conditions of the contract in addition to those stipulated in foregoing clauses which along with schedules and annexure, shall be deemed to form part of detail specification for equipment. The tenderer are advised to study and familiarize themselves with the terms & conditions of the tender.
- k. All material shall be best quality in the market and be capable of satisfactory operation when exposed to the local atmospheric conditions at site.
- l. The tenderer is required to submit a statement of facts in details as to their previous experience in performing a similar or comparably work and business and technical similar or comparable work and business & technical organization. Financial resources and manufacturing facilities available to be used in performing the contract.
- m. Force majeure clause shall apply.
- n. No other conditions except those mentioned above will be acceptable.
- o. Offers not complying with the delivery schedule shall be considered non responsive and shall not be evaluated
- p. Offers not providing clause by clause compliance shall be considered non responsive and shall not be evaluated
- q. Offers not providing minimum array capacity of designated rating (Wp) shall be considered non responsive and shall not be evaluated
- r. Offers not submitted as per price bid format shall be considered non-responsive and shall not be evaluated.

**6. EARNEST MONEY:**

1. Tenders shall be accompanied with the earnest money Rs.2,04,000.00 (Rupees Two lac four thousand only) in the form of CDR/FDR/DD pledged to the District Superintending Engineer, Leh.
2. Tenders not accompanied with the required amount of earnest money will be rejected and their price bid shall not be opened.
3. The earnest money of the tenderers shall be forfeited if they withdraw their tender or raise the prices of their offer within the validity period. The earnest money shall also be forfeited in case of the tenderers who do not comply with the purchase order placed on them within the validity period of the offer or violate any terms and conditions contained herein for this, purchase order shall be deemed to have been placed from the due date of letter of intent.
4. Earnest money deposit shall be released in favour of the unsuccessful tender(s) within one month after the final acceptance of the tender.

**7. SECURITY DEPOSIT:**

- The successful tenderer(s) shall be required to furnish security deposit equivalent to 10% of the value of the contract in the CDR/FDR from nationalized/scheduled bank pledged to the District Superintending Engineer, Leh. This shall be released after testing and commissioning of the Solar Water Pumping Systems.

- Security deposit shall be furnished within one month from the date of detailed purchase order. Failure to do so within the stipulated period will make the contract liable for cancellation together with forfeiture of EMD at the discretion of chairman purchase committee. The EMD of the successful tenderer(s) equivalent to Rs.2,04,000.00 shall be released after the submission of the security deposit.

#### **8. WARRANTY:**

- The warranty period for the water pumping system including the motor pump set will be a minimum of two years from the date of installation of the system.
- PV modules supplied with the solar water-pumping system 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.
- Necessary maintenance spares for three years trouble free operation shall also be supplied with the system.
- The supplier shall be responsible to replace free of cost (including transportation and insurance expenses) to the purchaser whole or any part of supply which under normal and proper use become dysfunctional within one month of issue of any such complaint by the purchaser.
- In case the supplier fails to rectify/replace the defective/damaged equipment including transit damage, shortages within one month from the date of intimation of such shortage/damage, they shall have to pay interest to The District Superintending Engineer, Leh, and Leh @3% per month on the value of such materials.

#### **9. MAINTENANCE:**

- The supplier shall be responsible for the maintenance of the systems for a period of 3 years (inclusive of 2 years of warranty) from the date of commissioning of the systems. The price quoted by the supplier should include the maintenance for 3 years. The manufacturer will submit a quarterly report about the maintenance of the system.
- The bidder shall give the details of their service centres in Leh district or nearest places and ensure that all the essential men and materials are placed to ensure quick and efficient operation and after sales service.

#### **10. SALES TAX ETC:**

- The rates offered by the tenderer for design, manufacturing, supply, installation, commissioning, construction of civil works and operation and maintenance should be inclusive of all taxes, F.O.R. at the site.
- In case of failure to deliver in full the required supplies on order, the purchaser shall have the right to make a risk purchase at the cost of supplier and/or cancel the contract and claim reasonable compensation/damages. The contract of supply shall be repudiated if the

supplies are not made within the prescribed period and to the satisfaction of the purchasing officer.

- The price bid should include CST, income tax, surcharge on income tax, service tax, local taxes etc. Income tax, service tax and other deductible taxes shall be deducted at the source.

#### **11. DELIVERY OF THE PUMP:**

- The bidder shall indicate delivery time along with the offer and shall be mutually agreed at the time of order finalization.

#### **12. VALIDITY:**

The tender should be unconditionally valid for a period of six months from the date of opening of the tenders. The quoted price per system as such shall be firm and not variable with the market price. The rates approved as per the NIT year would be valid for further purchase of the systems during the validity period. Any tenderer revising the offer within the validity period, without prejudice to other remedies available with the department is likely to be blacklisted.

#### **13. PAYMENT SCHEDULE:**

25% shall be made as advanced payment to the successful, subject to the submission of a bank guarantee for an equal amount valid for a period of one year at least. Another 25% shall be released on receipt of the material at the site, 47% after the installation and commissioning. 3% shall be released in three equal instalments at the end of each year on submission of documentary evidence confirming successful maintenance during that year.

#### **14. PENALTY:**

In case of failure on the part of the tenderer to make supplies and execute the work in full, part thereof within the delivery schedule stipulated in the purchase order, penalty @ 0.5% per week of undelivered portion subject to a maximum of 15% of the cost of undelivered portion shall be levied.

#### **15. CHANGES:**

No variation or modification or waiver of any of the terms and provisions of these specifications shall be deemed valid unless mutually agreed upon in writing by both the purchaser and the supplier.

#### **16. PACKING:**

The bidder shall be responsible for assuring that all commodities shipped are properly packed and protected to prevent damage or deterioration during shipment. Packaging and shipping costs shall be borne by the supplier. Customs clearance and all costs and actions associated with import duties, taxes and processing of documents are to be borne by the bidder. The supplier shall be responsible for all the damages/losses if any. All crates shall be marked with proper signs indicating UP and DOWN sides of the packing and also unpacking instructions considered necessary by the supplier.

**17. INSURANCE:**

The bidder shall provide insurance coverage ex-factory until commissioning, and acceptance for replacement or repair of any part of the consignment due to damage or loss.

**18. HEALTH, SAFETY AND ENVIROMENT:**

The bidder shall submit the following before starting the installation of the solar water pumping system.

- Safety and Environment policy of the Company
- HSE Manuals for Installation
- Emergency Management Plan

**19. AGREEMENT:**

The successful tenderer(s) shall be required to execute an agreement on a valid stamped paper for strict compliance of the terms and conditions of the contract, vis-à-vis the NIT and the supply order within seven days of placement of the order

**20. TECHNICAL SPECIFICATION (refer to Annexure I for 1800Wp Submersible Pump):**

Executive Engineer, P.H.E Division  
Leh-Ladakh.

**ANNEXURE I: TECHNICAL SPECIFICATIONS FOR 1800 W<sub>p</sub> SOLAR  
SUBMERSIBLE PUMPS**

PREPARED BY **LREDA**  
FOR PHE DIVISION LEH

## **1. DEFINITION:**

A solar photo-voltaic pump is a water lifting device consisting of the following:

- a) SPV panel/array
- b) Motor pump (AC/DC)
- c) Optional Power Conditioning Unit (for conversion of DC to AC in case of an AC pump)
- d) Structure for mounting solar modules with a provision for manual tracking and altering the angle of inclination with respect to the horizontal.

## **2. DUTY CYCLE:**

- The water requirement should be a minimum of 20 litres of water per watt of PV array capacity used per day from a total depth of 50 metres for 1800 Wp submersible pumps.
- Use of a tracking system to enhance the availability of solar radiation to lift desired quantity of water is permitted.
- The manufacturer of SPV water pumping system shall specify whether the minimum output is achieved directly or through a tracking PV array.

## **3. SPV MODULES:**

- The SPV water-pumping system should be operated with a PV array in the range of 1800 Watts measured under standard test conditions.
- Sufficient number of modules in series and parallel shall be used to obtain the required PV array current, voltage and power output.
- Crystalline high power cells shall be used in the Solar Photovoltaic module. Each solar module shall consist of redundantly interconnected photovoltaic cells and peak power rating shall not be less than 75W for 1800 Wp submersible pumps.
- To connect the solar modules interconnection cables shall be provided. Photoelectric conversion efficiency of SPV module shall be greater than 13%. Modules shall be made of high transmissivity glass front surface giving high encapsulation gain and silicon rubber edge sealant for module protection and mechanical support.
- All materials used shall have a proven history of reliable and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 100% with temperatures between -30 Deg C and +85 Deg C and with stand gust up to 200 km/h from the back side of the panel.
- The offered module shall be in accordance with the requirements of IEC 61215-Edition II for quality of crystalline silicon solar cell modules, IEC 61730 (Part I and Part II). The bidder shall submit appropriate certificates.
- The rated output power of any supplied module shall not vary more than 3-5% from the average power rating of all modules.
- The module frame shall be made of corrosion resistant materials, which are electrolytically compatible with the structural material used for mounting the module.

- Protective devices against surges at the PV module shall be provided, if required. Low voltage drop bypass and / or blocking diode(s) may also be provided, if required.
- 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 solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the silicon cells and the module framing arrangement/material. The encapsulation arrangement shall ensure complete moisture proofing for the entire life of the solar modules.
- Each module shall have low iron tempered glass front for strength and superior light transmission. It shall also have tough multi layered polymer back sheet for environment protection against moisture and provide high voltage electrical insulation.
- The fill factor of modules shall not be less than 0.70.
- Array capacity shall not be less than the designed capacity and number of modules required shall be worked out accordingly.
- Module Junction box (weather resistant) shall be designed for long life outdoor operation in harsh environment.
- The terminal box on the module should have a provision for opening for replacement of the cable if required.
- Each PV module must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.)
  - i. Name of the manufacturer of PV Module
  - ii. Name of the Manufacturer of Solar cells
  - iii. Month and year of the manufacture (separately for solar cells and module)
  - iv. Country of origin (separately for solar cells and module)
  - v. I-V curve for the module
  - vi. Wattage,  $I_m$ ,  $V_m$  and FF for the module
  - vii. Unique Serial No and Model No of the module
  - viii. Date and year of obtaining IEC PV module qualification certificate
  - ix. Name of the test lab issuing IEC certificate
  - x. Other relevant information on traceability of solar cells and module as per ISO 9000 series.

Data sheet shall be furnished duly filled as follows:

1)	Mounting arrangement for Solar module	:	
2)	Solar module frame material	:	
3)	Module type	:	
4)	Module dimensions	:	
5)	No. of solar cells per module	:	
6)	Solar cell manufacturer type	:	
7)	Make of Solar module	:	
8)	Peak power voltage ( $V_{mp}$ ) at 25 Deg C	:	

9)	Peak Power current (Imp) at 25 Deg C	:	
10)	Open circuit voltage (Voc) at 25 Deg C	:	
11)	Short circuit current (Isc) at 25 Deg C	:	
12)	Weight of each module	:	

#### 4. **SPECIFICATIONS:**

The specifications for the solar pump system shall observe the specification listed in Table 4.1 below:

**TABLE 4.1: TECHNICAL SPECIFICATIONS**

<b>S.NO.</b>	<b>Model No.</b>	<b>Submersible Pump ( Mono) 1800 Wp</b>
1	System Configuration	As per the pump connection requirement
<b>a)</b>	<b>SPV ARRAY</b>	
i)	Array Wattage	1800 Wp
ii)	Array Voltage	As per design
<b>b)</b>	<b>SPV MODULE</b>	
i)	Model No.	
ii)	Wattage under STC	75Wp
iii)	Module Type	Crystalline
iv)	Current at Maximum Power, Ip	4.4 Amps
v)	Voltage at Maximum Power	17V
vi)	Short Circuit Current	4.76
vii)	Open Circuit Voltage	21.2
<b>c)</b>	<b>MOTOR PUMP SET</b>	
i)	Capacity	2HP
ii)	Input Voltage	140V (DC)
iii)	Voltage range in which pump will continue to lift water	
<b>d)</b>	<b>SUPPORT STRUCTURES</b>	
i)	<b>Number</b>	2
ii)	<b>Tracking</b>	To be provided

<b>ELECTRONICS AND OTHERS</b>		
e)	<b>Cables etc.</b>	As per requirement
f)	<b>Inverter</b>	1500W or as per the requirement for 1800Wp pump
g)	<b>Inverter Output Voltage</b>	140V
2.	<b>Delivery Pipe</b>	2 inch size. GI/MS pipe as per design approved by IREDA (the length of the delivery pipe should be as per site requirements)
3.	<b>Spares</b>	One set each of carbon brush, MCB, mechanical seal, foot Wall, Fuse, Bearing & Tool Kit containing screw driver set, spanner set, cutter, plier, thimble
3.	<b>Average Daily Water Delivery</b>	40,000 litres per day
4.	<b>Overall Efficiency of the Water Pumping System</b>	More than 42.23%

**5. MOTOR PUMP SET:**

- The pump set supplied by the successful bidder should be from an ISO 9001 certified company.
- 16 nos. pump sets for 1800 Wp submersible pumps (that is to be supplied) shall have been installed earlier; proof of the same to be enclosed.
- **Rotor and stator sizing of the motor shall be adjusted to accommodate the use of the motor pump set at sites where heads are greater than 60 metres. The adjusted specifications shall be provided**

**6. PROTECTION AND SAFETY:**

The following protection and safety measures shall be ensured; no damage shall occur to the system under these conditions.

- Protection against dry operation of motor pump set shall be provided
- The motor shall be protected against transients from the power supply according to IEC 60664-1 “Overvoltage Category III”
- Foot valve shall be provided against lightning, storms etc.
- MIVs shall be provided in junction box against open circuit, accidental short circuit and reverse polarity

- The motor shall be protected against over-temperature; in the case where the temperature rises the motor shall be cut out automatically. The motor shall be cut in automatically when the temperature has dropped to normal range.

**7. MOUNTING STRUCTURE:**

- The mounting structure must have a provision for manual tracking at least three times in a day and also a provision for altering the angle of inclination with respect to the horizontal.
- Leg assembly of mounting structure made of different diameter galvanized tubes may be accepted. The work should be completed with supply, fitting fixing of clamps, saddles, nut & bolts etc. While quoting the rate, the bidder may mention the design & type of structure offered. All nuts & bolts shall be made of high quality stainless steel.
- The structure shall be designed to allow easy replacement of any module and shall be in line with site requirements.
- The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly. There shall be no requirement of welding or complex machinery at site.
- The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels. At the same time it should withstand wind speed up to maximum 150 km/h.
- The drawings along with detailed design shall be submitted to P.H.E Division, Leh for approval before starting the execution work. The supplier/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings. The work will be carried out as per designs approved by P.H.E Division, Leh.

**8. JUNCTION BOX:**

- A junction box with an on/off switch mounted on a support pole must be provided with a suitable cable in order to connect the SPV array directly to the DC centrifugal pump or to the AC submersible pump through an inverter.
- The junction boxes shall be dust, vermin and waterproof and made of FRP / ABS / Thermo Plastic.

**9. BIS SPECIFICATION:**

Components and parts used in the solar pumping system (SPV pumps) should conform to the BIS specifications wherever such specifications are available & applicable.

**10. INSTRUCTION MANUAL:**

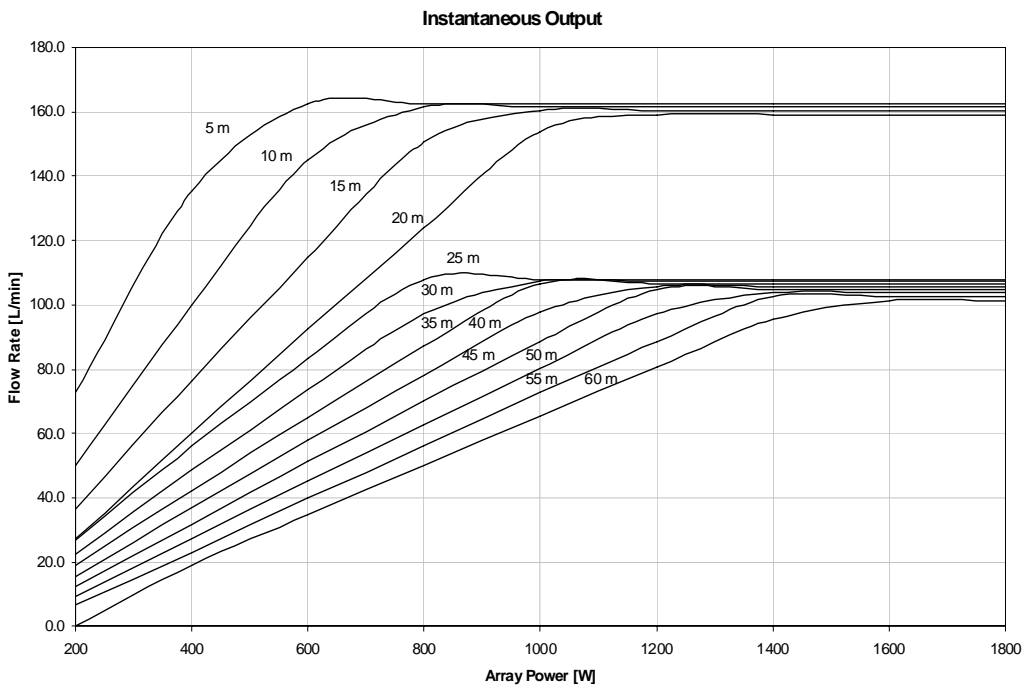
An operation, instruction and maintenance manual in English, Urdu and Hindi should be provided with every solar water-pumping system. The following details must be provided in the manual:

- Information on Photo-voltaic technology
- Information on D.C centrifugal pumps/A.C submersible pumps
- Information on P.V module
- Clear instructions on mounting of P.V. modules
- Information on the operation of SPV pumps
- Do's and Don'ts
- Clear instructions on maintenance and troubleshooting of SPV pumps.
- Name and address of the person or service to be contacted in case of failure or complaint

## 11. INSTALLATION:

The drilling and casing of the borehole for submersible pumps shall be carried out by the government itself. The supplier will supply and install the SPV modules, array tracking structure, pump set, inverter (Electronics), delivery pipe as per site requirements (details of head provided in **List of Locations for Installation**) of GI/MS pipe and other accessories as per the MNRE/IREDA specification. If the pipe required for submersible pumps is more than 70 metres, then rate of the pipe per meter length should be quoted. In case of surface pumps the supplier will supply and make the necessary foundation and other accessories for the installation of SPV surface pumps.

## 12. TYPICAL PERFORMANCE CHART OF SUBMERSIBLE PUMPS:



**13. BILL OF MATERIALS:**

<b>Si. No</b>	<b>Description</b>	<b>Total</b>	<b>Units of Material</b>
1	Solar Modules (crystalline, 75Wp minimum)	1800	Wp
2	Junction Box	Suitable for above	Set
2	Motor Pump Set (2HP Submersible AC Pump)	1	Set
3	Mounting/Support Structure for Solar Modules (manual tracking ensured)	2	Set
4	PCU or Inverter for AC submersible pump	1	Set
5	Delivery Pipe (GI/MS Pipe, of 2 inch diameter size for AC pumps as per site requirements)	1	Set
6	Cables	As required	Set
7	Other misc./BoS items (nuts, bolts, washers, etc.)	1	Set
8	Spares (One set each of carbon brush, MCB, Mechanical Seal, Foot Wall, Fuse, Bearing & Tool Kit containing screw driver set, spanner set, cutter, plier, thimble)	1	Set

## **PART II – COMMERCIAL BID**

Part II of the tender should be superscribed as “*Part II, Commercial Bid for NIT No*” and should contain:

- Proof of Earnest Money.
- Income Tax Clearance Certificate.
- Proof of annual turnover of Rs. 500 million in the last financial year and 50% from solar photo voltaic turnover
- Demand Draft for the purchase of tender document

**PART III – PRICE BID**

S No.	Description	Price Bid (Rs.)
1	Supply, Installation, Commissioning of 1800 Wp Solar Submersible Pump as per the Bill of Materials in Annexure 1, Item 13.	
2	Rate for Annual Maintenance Contract for 3 years with a warranty period of 2 years	
	<b>TOTAL COST</b>	

Note: The price quoted shall include all taxes and duties, custom duty, excise duty, service tax, sales tax, C.S.T, local taxes, trade tax, surcharge on income tax if applicable and all other taxes applicable.

Signature of the officer issuing tender:

**(Signature of the Tenderer with Seal)**

Signature of officers Opening Tender:-