

Online tenders are invited in two stage bid system i.e. Technical bid and Financial Bid as per the details given below in Schedule-A

(w.e.f 04.04.2024)

SCHEDULE-A

Sr. No.	PARTICULARS	REMARKS
1	Tender Notice No.	02/2023-2024
2	Sr. No. of Tender.	i) Group-II
3	Superscribed No. of Tender.	100/HR/RC/E-5/2024-25
4	Online submission of EMD, Tender fee & e-Service Fee Option-1: Through Net Banking and Debit card	On or before last date of submission of Technical Bids upto 12:00 Noon
5	Online submission of EMD Option-2: Through RTGS/ NEFT- <i>(In case of above, the bidder has to pay Tender Fee & e-Service Fee Through Net Banking and Debit card as per the given date & time schedule)</i>	On or before 05.07.2024 Upto 02:00 P.M.
6	Online Bid Preparation & submission.	Upto 08.07.2024 at 02:00 P.M.
7	Date & time of opening of Technical Bids/s.	On or after 08.07.2024 at 02:30 P.M.
8	Date & time of opening of Financial Bids/s	To be decided later on
9	Tender Fee:	
	(I) For Haryana based manufacturing Micro and Small Enterprises (MSEs) & Khadi Village Industries Unit eligible as per the "Haryana State Public Procurement Policy for MSME -2016" notified vide G.O. No. 2/2/2016-4I BII(1) dated 20-10-2016 and for Startups/first generation Entrepreneurs as notified vide G.O. No.2/2/2016-4IB-II dated 03.01.2019	NIL
	(II) For remaining bidders both from the Haryana and Non Haryana	Rs. 5000/-
	Earnest Money Deposit (EMD) required:	
10	(I) For Haryana based manufacturing Micro and Small Enterprises (MSEs) & Khadi Village Industries Unit eligible as per the "Haryana State Public Procurement Policy for MSME -2016" notified vide G.O.No.2/2/2016-4IBII(1)dated20-10-2016 and for Startups/first generation Entrepreneurs as notified vide G.O. No.2/2/2016-4IB-II dated 03.01.2019	NIL
	(II) Central or Haryana Public Sector Enterprises and "approved sources" as declared by the Industries Department, Haryana	NIL
	(III) For remaining bidders both from the Haryana and Non Haryana	Rs. 2,00,000/-
11	E-Service Fee	Rs.1000/-
12	Date and time of receipt of samples (if required)	N.A
13	Rates to be kept valid for acceptance upto:	31.12.2024

A. Information to Bidders:

i. The Bidders can download the tender documents from the Portal: <https://etenders.hry.nic.in>

1. Date and Time of making payment of tender fee, earnest money deposit (EMD) and e- service fee is asunder:

A	Online submission of EMD, Tender fee & e-Service Fee Option-1: Through Net Banking and Debit card	On or before last date of submission of Technical Bids upto 12:00 Noon
B	Online submission of EMD Option-2: Through RTGS/ NEFT- <i>(In case of above, the bidder has to pay Tender fee & e-Service fee Through Net Banking and Debit card as per the given date & time schedule)</i>	On or before 05.07.2024 Upto 02:00 P.M.

2. As the Bids are to be submitted online and are required to be encrypted and digitally signed, the Bidders are advised to obtain Digital Signature Certificate (DSC) at the earliest. For obtaining Digital Certificate, the Bidders should follow Point No.- 2 under “Instructions to bidder on Electronic Tendering System” and available in folder of “Tender Forms” available on following link <https://dsndharyana.gov.in/downloads/> and for information about DSC at NIC Portal visit <https://etenders.hry.nic.in/nicgep/app?page=DSCInfo&service=page>
3. The Bidders shall have to pay for the Tender Documents Fee, EMD Fees & e-Service Fee online by using the service of secure electronic payment gateway. The secure electronic payments gateway is an online interface between bidders and online payment authorization networks.
4. The bidders must have Net Banking account in order to pay Tender Document Fee and e-Service Fee.
5. **Payment of Tender Fee:-** The payment for the Tender Document Fee shall be made by the interested bidder online directly through Net Banking with the available Banks at e- GRAS e- Payment Gateway.
6. **Payment of e-Service Fee:-** E-Service Fee payment shall be made separately by the interested bidders/ contractors online directly through Net Banking Account.
7. **Payment of EMD:-** The payment of EMD can be made through Net Banking or RTGS/ NEFT as per details at Para-2 above. In this regard please refer to “Instructions to bidder on Electronic Tendering System” available at the available in folder of “Tender Forms” on website : <https://dsndharyana.gov.in/downloads/>
8. Intending bidders will be mandatorily required to sign-up online (create user account) on the website <https://etenders.hry.nic.in> to be eligible to participate in the e-Tender. In case the intended bidder fails to pay EMD fee under the stipulated time frame, he/she shall not be allowed to submit his/ her bids for the respective event/Tenders.
9. In case of payment of EMD through RTGS/ NEFT, the interested bidders must remit the funds atleast T+1 working day (Transaction+ One Day) in advance i.e. on or before 05.07.2024 upto

2.00 P.M; and make payment via RTGS/NEFT to the beneficiary account number specified under the online generated challan. The intended bidder/ Agency thereafter will be able to successfully verify their payment online, and submit their bids on or before the expiry date & time of the respective events/ Tenders at <https://etenders.hry.nic.in>.

10. However, the details of the EMD, Tender document Fee & E - Service Fee are required to be filled/ provided at the time of online Bid Preparation.
11. Online Technical Envelope—Reference details of the Earnest Money Deposit, Tender Document Fee & e - Service Fee instrument and scanned copies of supporting documents and QR/technical criteria with proper index and page numbering on all the documents have to be provided as per Annexure-IA of this document.
12. If the tenders are cancelled or recalled on any grounds, the Tender Document Fee and e-Service Fee will not be refunded to the bidder.

B. Brief Description of Procuring/ Rate Contract item:

1. Scope of Work:-

The Scope of Work of a vendor shall include to Design, Manufacture, Supply, Transport, Installation, Testing and Commissioning of stand-alone off Grid Solar Photovoltaic Water Pumping Systems (SPWPS) of 3-10 HP capacity in the Haryana State, including complete system warranty and its repair and maintenance for 5 Years under Component- 'B' of PM-KUSUM scheme of MNRE. As per MNRE specifications and applicable BIS standards, vendor shall follow all provisions of the Scheme Guidelines as amended from time to time. The brief details are as under:

Sr. No.	Description of Stores	Quantity of Rate Contract item	Place of Delivery
1	Supply, installation and commissioning of Solar Water Pumping Systems in the Haryana State with five years warranty of complete system.	Approx.35000 nos.	At farmers field within Haryana State

The detailed technical specifications/description of the above stores are available at Annexure-A of this document.

2. Supply and Manufacture

- a. The Selected vendor shall be responsible for design, supply, installation and commissioning of SPWPS along with 5 years of repair and maintenance. To ensure timely maintenance of SPWPS, apart from training a local person and making available necessary spare parts & tools in each district, to ensure timely maintenance of the systems the vendor shall have one authorized service center in each operational district and a helpline in local language in each operational State. Helpline number shall be indicated on the pump/ controller at suitable location easily visible to the user.

- b. Each pumping system should be marked with Toll Free No. of the vendor (Toll Free No. shall be affix on controllers and shall be readable for 5 years) operating in English and Hindi or Regional language of respective state and specific pump number and same must have been captured by SIA's (State Implementing Agency i.e. Director General, DNRE & HAREDA for the State of Haryana) web-based application (as per instruction of NRE&HAREDA i.e. Director General, DNRE&HAREDA) at the time of installation at site. During the time of PDI, test report of ordered solar pumping systems, warranty certificates and structure certificate as specified in the guidelines and specification issued by MNRE should be provided by the bidder.
- c. Test reports shall be submitted with the bids. Bid without valid test report as per MNRE specification, guidelines and accredited/approved laboratory will be rejected out rightly.
- d. As per MNRE Office Memorandum no. 32/645/2017-SPV division Dated 13.11.2020, the Test certificate already available for a particular model of solar pumping system can be used by other vendor provided they obtain written consent from the owner of test certificate to use the same. Further in case of change in the model/type of solar module of already tested solar pumping system. The vendor shall get technical compatibility certificate for the changed solar module, as provided in the testing procedure specified by MNRE along with the consent from testing certificate owner. This will avoid repetitive testing of same model of solar pump and faster implementation.

2.1 Installation and Commissioning

- a. Installation and commissioning of SPWPS shall be done by the vendor as per the details provided by the NRE &HAREDA. The vendors shall co- ordinate with NRE& HAREDA for repair and maintenance of SPWPS for 5 years.
- b. Selected vendors shall complete the installation and commissioning of SPWPS within 120 days from date of issuance of NTP. The NRE&H may authorize any individual or committee or organization to witness and validate the installation/commissioning on site(s). Commissioning certificates shall be issued by the NRE & HAREDA after successful commissioning of allotted SPWPS. MNRE authorized representative may also be allowed for the inspection/ commissioning if required.
- c. Selected Vendor and NRE& HAREDA representative should conduct site survey and submit Progress report on fortnightly basis as per the requirement of NRE & HAREDA via PM-KUSUM App released by MNRE.
- d. Action plan should be submitted to NRE&HAREDAs including complete details of team, resources, and service centers in each district within 30 days of acceptance of LoA from NRE&HAREDA, failing of which by vendor, NRE&HAREDA have the right to levy penalty.
- e. Vendors will have to submit installation reports as per given format on weekly basis and Monthly basis to MNRE and NRE&HAREDA. These reports can be also submitted through e-mail.
- f. Vendor will have to submit the completion reports of each district to NRE&HAREDA

within one week from 100% completion of work as per allocation of each district. These reports can be also submitted through e- mail.

- g. Selected Vendor shall submit monthly and quarterly progress reports to NRE&HAREDA in online mode.
- h. Vendor shall comply with all applicable regulatory and statutory norms. Vendor must obtain approval/ NOC from appropriate Govt. body for implementing the project in each selected village.
- i. Selected vendor should have finalized sub-bidders and Purchase order for all materials such as PV Modules, Structure, Pump, Controllers, etc. within 30 days from date of award of contract and un priced copy of such award letter/Purchase order will be submitted within 30 days from date of issuance of award.
- j. Vendor should commission minimum pumps/ quarter as defined above of Scope of work. Vendor must submit handing over certificates in the format prescribed by MNRE.
- k. Each SPWPS is to be provided with the required details as mentioned in the specification and guidelines of the PM-KUSUM scheme.
- l. Vendor should submit the prescribed certificate and photographs of each SPWPS installed which must show complete installation setup along with beneficiary pump number etc. These reports can be also submitted through email/web- portal/mobile application.
- m. The selected vendors shall take all necessary permits, approvals and licenses, insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.
- n. Time Schedule includes the time required for mobilization as well as testing, rectifications if any, retesting and completion in all respects to the entire satisfaction of Engineer-In Charge designated by respective NRE&HAREDA.

2.2 Technical Requirement and Testing

- 2.2.1 SPWPS installed under this programme should meet technical specification and construction standards as specified by BIS and MNRE from time to time as given in Annexure-A, B & C of the tender as per amendment dated 16.03.2023 and later the same is notified by the MNRE vide Office Memorandum no. 41/3/2018-SPV Division Dated 22.03.2023.
- 2.2.2 It will be mandatory to use only indigenously manufactured solar panels with indigenous solar cells and modules. Further, the motor-pump-set, controller and balance of system should also be manufactured indigenously.
- 2.2.3 In case of any ambiguity in interpretation of any of the provisions of PM- KUSUM Guideline, the decision of the MNRE shall be final.
- 2.2.4 Systems installed under this programme should be follow OM- F.No.283/22/2019- GRID SOLAR of MNRE, Govt of India dated 09.02.2021.

2.3 Operation & Maintenance (O&M), Training, Awareness and Sensitization

- 2.3.1 Selected Vendor should keep necessary spare parts (minimum 2% of allotted quantity of

each component of the complete system at the service center) at each district and should ensure proper maintenance of SPWPS till 5 years from date of installation of each SPWPS. Vendor should also ensure to provide local training to local persons regarding proper maintenance of SPWPS. Vendor should submit bi-weekly installation report or through email to NRE&HAREDA as per the prescribed format provided.

2.3.2 Any complaint registered registered/service calls received should be attended at the earliest and the system should be repaired/restored/replaced within 3 days from date of complaint received/informed to the vendor.

2.3.3 MNRE officials, NRE&HAREDA or its designated agency may inspect the systems during the installation or operational phase. In case the installed systems are not as per the standards, found non-functional on account of poor quality of installation or maintenance or not in-compliance with the guidelines and specification and tender terms and conditions. NRE & HAREDA reserves the right to encash the PBG and/or blacklist the vendor for the period 5 years.

2.3.4 If any selected vendor, after getting empanelled does not go forward with signing of agreement with NRE&HAREDA and execution of work after the issuance of NTP(s), apart from encashment of EMD, vendor will be blacklisted for 5 years period from the date of issuance of such notice of blacklisting by the respective NRE&HAREDA/MNRE.

2.3.5 The Vendor must provide an O&M manual in both English and local language with each SPWPS to the beneficiary. The following minimum details must be provided in the manual: -

- Basic principles of PV system
- As mall write-up (with a block diagram) on SPWPS- its components, PV module, electronics and expected performance
- A simple single line diagram (SLD) depicting the electrical circuits and Control mechanism
- Type, model number, voltage and capacity of the motor used in the system
- The make model number and country of origin of each component
- Significance of indicators
- Clear instruction on regular maintenance and trouble shooting of the SPWPS
- Preventive maintenance schedule
- Detailed information about warranty coverage
- Dos and Don'ts
- Name and address of the contact person for repair and maintenance in case of non-functionality.
- Description of frequent faults of PV module and pump and its remedies
- Minimum 10 hard copies in (booklet form kept a teach service center also to be provided to NRE&HAREDA as and when required.

2.3.6 The O &M cost for 5 years should be inbuilt with system cost.

2.3.7 Vendors will mandatorily provide CMC for a period of 5 years from the date of commissioning of the systems including insurance coverage for the installed systems against natural calamities and theft. CMC will include inspection by Vendor at least once in a quarter and submission of quarterly inspection report of the installed pumps as per prescribed format. Selected Vendor shall provide a

copy of valid insurance certificate of SPWPS to the beneficiary and same shall be renewed every year.

2.3.8 Vendors have to provide the Remote Monitoring System (RMS) as per Annexure-A of the tender (RMS Communication and Security Architecture- PMKUSUM National Portal) of the RfS with all the SPWPS installed under the scheme. Further, vendor has to maintain the RMS in working condition for the period of 5 years and RMS systems shall push the accurate data of the parameters as specified in the specification and guidelines of the scheme as per Annexure- A, B & C of the tender (RMS Communication and Security Architecture- PM KUSUM National Portal), failing which the installation of the system will not be accepted by NRE&HAREDA.

2.3.9 Vendor shall ensure that the local training, awareness and sensitization campaigns on usage of the SPWPS are conducted.

4. Selection of Beneficiary:-

The implementation of the scheme is demand based and the beneficiary eligible as per the PMKUSUM scheme of MNRE, GoI/DNRE&HAREDA guidelines are allowed under said tender.

5. Total capacity and types of Pumps allowed

The indicative cumulative quantities envisaged under this tender for Stand alone Solar Pumps under PM-KUSUM are around **35,000 Solar Water Pumping Systems**. However, the quantity may inter-change capacity, type etc. wise as per requirement of farmers. The following types of pump are planned for empanelment under the tender:

Sr No	Pump Capacity(HP)	Pump Type	Pump Position	Controller Type	Total Tentative Quantity (In Nos.)
1	3	DC	Submersible	Normal (Without USPC)	3000
2		DC	Submersible	with USPC	300
3		DC	Surface	with USPC	450
4	5	DC	Submersible	Normal (Without USPC)	8500
5		DC	Surface	Normal (Without USPC)	7000
6		DC	Submersible	with USPC	300
7		DC	Surface	with USPC	450
8	7.5	DC	Surface	Normal (Without USPC)	8500
9		DC	Submersible	with USPC	500
10		DC	Surface	with USPC	500
11	10	DC	Surface	Normal (Without USPC)	5000
12		DC	Surface	with USPC	500
Total					35000

6. Performance Monitoring

Selected Vendor must ensure working of minimum of 95% of total installed SPWPS at any point of time. Remote monitoring system shall be installed integrated with the SPWPS controllers rather than having as a separate unit through an integral arrangement and it should be capable of providing accurate live status/parameters on State portal maintained by NRE&HAREDA and on central portal maintained by MNRE. Detailed requirements of Remote Monitoring System along with minimum performance requirements are brought out as per Annexure-A of the tender. Further, the vendors have to submit quarterly physical inspection report of installed solar pumps as per requirement of the Department.

7. Commissioning of Projects

Selected vendors must submit monthly consent of beneficiaries in their favor to DNRE/HAREDA for which DNRE/HAREDA will give notice to proceed/online mechanism developed by DNRE/HAREDA has to follow for the same and for this selected vendor shall complete the installation and commissioning of allocated SPWPS within 120 days from issuance of notice to proceed.

- 7.1 Commissioning of the SPWPS shall be carried out by the vendor in line with the detailed procedure as mentioned in the tender. DNRE/HAREDA may authorize any individual or committee or organization to witness and validate the installation/commissioning on site(s). Commissioning certificates shall be issued by the concerned district offices of DNRE/HAREDA after successful commissioning of allotted SPWPS. MNRE authorized representative may also be allowed for the inspection/ commissioning if required.

SECTION III ST AND ARDCONDITIONS OF THE CONTRACT

8. Performance Bank Guarantee (PBG)

- a) Selected Vendors shall submit to the DNRE/HAREDA, a Performance Bank Guarantee (PBG) for a value required in the tender of the amount equivalent to the value of 1000 (5 HP) pumps. However, if total number of SPWPS awarded to vendor is more than 1000 nos. of SPWPS then vendor shall submit another PBG equivalent to differential value of order as per notice to proceed (NTP)/work order. It may be noted that Selected Vendors (lead member in case of JV as applicable to lead member) shall submit the Performance Guarantee according to the **Format -7.3** with a validity period up to (& including) the date as on 24 months from placement of award by NRE & HAREDA. Validity of PBG shall be extended by the vendor for every year for the first five years. Further, NRE&HAREDA reserves the right to encash the existing CPG, in case the vendor doesn't renew/extend the existing PBG at-least 30 days in advance.
- b) PBG(s) shall be submitted by selected vendors to NRE&HAREDA within 15 days from issuance of letter of award/empanelment.
- c) The Successful Bidder/Selected Vendor shall furnish the PBG from any of the Scheduled Commercial Banks as listed on the website of Reserve Bank of India (RBI) and amended as on the date of issuance of bank guarantee. Bank Guarantee issued by foreign branch of a Scheduled Commercial Bank is to be

- endorsed by the Indian branch of the same bank or State Bank of India (SBI).
- d) The Bank Guarantees must be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to the place of execution.
 - e) All expenditure towards execution of Bank Guarantees such as stamp duty etc. shall be borne by the Bidders.
 - f) In case of Bank Guarantees issued by foreign branch of a Scheduled Commercial Bank, the same is to be endorsed by the Indian branch of the same bank or SBI.
 - g) In the event, a vendor not able to submit Bank Guarantee of the requisite value(s) towards PBG, within due time, DNRE/HAREDA shall have the right to encash the EMD/PBG submitted earlier and return the balance amount (if any) for the value of EMD pertaining to unsuccessful capacity.

9. Notice to Proceed/Completion Time.

Selected vendors should ensure the completion of work as per Letter of Empanelment (LoE)/ Notice to Proceed (NTP), tender terms and conditions, specifications, and guidelines of the scheme.

- a) The implementation work on ground should start within 15 days from the date of Notice to Proceed from DNRE/HAREDA.
- b) Successful vendor shall submit the un priced purchase order copies of solar pump sets, controllers and solar PV modules to DNRE/HAREDA within 30 days from the date of notification of award(Not applicable in case vendor itself is manufacturing all the items). In case un priced purchase order copies are not submitted within 30 days to DNRE/HAREDA, DNRE/HAREDA may cancel the contract and award the same quantity to another empanelled vendor.
- c) In order to achieve the target, suitable numbers of team must be deployed on the field by the selected vendor.
- d) Not with standing the transfer of ownership of the pump and equipment the responsibility of care and custody there of together with the risk of loss or damage there too shall remain with the Vendor until completion of facilities in which such pump and equipment are incorporated.

10. Payment Terms

Stage-1: 90 % of the value of month wise nos. of SPWPS installed at site based on:

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- Submission of detailed work plan (Project Execution Plan) with time line for the lot supplied duly approved by the DNRE/ HAREDA's representative.
- Submission of evidence in hard copy regarding completion of installation of SPWPS in good condition at site duly verified and acknowledged by Engineer-In Charge/SIA and Beneficiary.
- All the relevant warranty and quality (Performance Test Reports) of the lot to be submitted.
- Signing of contract agreement between DNRE/HAREDA and Vendor.
- Submission of Original Supply invoices/bills duly verified by the DNRE/HAREDA.

- Submission of software generated installation reports as per prescribed format by DNRE/HAREDA which shall include following but not limited to consumer details, site survey details, asset inspection and mapping details, Remote monitoring system parameters etc.
- Proof of distribution of O&M Manual to beneficiary printed in both English and local language.
- Submission of handing over certificates of SPWPS in the format as suggested by MNRE.
- Performance report for one week after commissioning based on the accurate data of the parameters received from RMS or data logger in case of internet unavailability.
- An Undertaking with respect to withstand ability of SPWPS to the wind speed of 150 km/hr in all weather conditions.

Stage-II: Balance 10% on completion of one month from date of completion certificate Note:

- Payment shall be made to vendor within 30 days after submission of three copies of invoices to Engineer-in charge, complete in all respects along with 90 days accurate performance data of SPWPS through RMS on State SEDM portal and central portal of PM-KUSUM.
- If the invoices are in complete in any respect or in case on non-compliance with terms and conditions of letter of award/Notice to Proceed, the payment due date shall start from the submission of all necessary documents. Installation and commissioning workmanship should be proper and farmer should be educated for it utility/User manual instructions/ not dislocating etc.

11. Minimum Paid up Share Capital to be Held by Project Promoter

The Bidder shall provide complete information in their bid in reference to this tender about its promoters and up on issuance of LoA, the Successful Bidder/Selected Vendor shall indicate its shareholding in the company indicating the controlling.

12. Non-Responsive Bid

The response to tender submitted by the bidder along with the documents submitted **online** shall be scrutinized to establish “Responsiveness of the bid”. Each bidder’s response to tender shall be checked for compliance with the submission requirements set forth in this tender. Any of the following conditions shall cause the Bid to be “non-responsive”:

- a. Non-submission of the requisite Bid Processing Fee as mentioned in the Bid Information Sheet.
- b. Response to tender not received by the due date and time of bid submission.

- c. Non-submission of correct, valid and operative Pass-Phrases for both Technical and Financial Bid (Price Bid) Parts after the deadline of Bid Submission, and before the commencement of the Online Tender Opening Event (TOE) of Techno-Commercial Bid.
- d. Any indication of price in any part of response to the tender, other than in the financial bid.
- e. Data filled in the Electronic Form of Financial Bid (Second Envelope), not in line with the instructions mentioned in the same electronic form.
- f. In case it is found that the Bidding Company including Ultimate Parent Company/ Parent Company/Affiliate/Group Companies have submitted more than one response to this tender, then all these bids submitted shall be treated as non-responsive and will be rejected.

In any of the above cases, the bid shall not be considered for bid opening and evaluation process.

13. Validity of the Response to tender and Rates discovered

The Bidder shall submit the response to tender which shall remain valid up to the date as on 12 months from the last date of bid submission (“Bid Validity”). DNRE/HAREDA reserves the right to reject any response to tender which does not meet the aforementioned validity requirement. Further, the rates discovered shall be valid for one year from the date of issue.

14. Right of DNRE/HAREDA to Reject a Bid

S&D/DNRE/HAREDA reserves the right to reject any or all of the responses to tender or cancel the tender or annul the bidding process for any project at any stage without assigning any reasons whatsoever and without thereby any liability. In the event of the tender being cancelled at any stage, the processing fee (excluding GST, if amount credited to tender issuing authority), without any interests, and EMD submitted by the Bidders shall be returned to the respective Bidders (if applicable).

15. Post Award Compliances

Timely completion of all the mile stones will be the sole responsibility of Vendor. DNRE/HAREDA shall not be liable for issuing any intimations/reminders to Vendor for timely completion of milestones and/or submission of compliance documents.

Any checklist shared with Vendor by Client Organization for compliance of above-mentioned milestones to be considered for the purpose of facilitation only. Any additional documents required as per the conditions of tender must be timely submitted by the Vendor.

16. Adjudicator

Adjudicator under the contract shall be appointed by the Appointing Authority of N&RE and HAREDA. If the bidder does not accept the Adjudicator proposed by N&RE and HAREDA, it should so state in its bid form and make a counter proposal of an adjudicator. If on the day the contract agreement is signed, the N&RE and HAREDA and contractor have not agreed on the appointment of adjudicator, the adjudicator shall be appointed, at the request of either party, by the MNRE.

17. Arbitration

Arbitration shall be carried out as per Arbitration Act 1996 and its subsequent amendment. The Contract shall be governed by and interpreted in accordance with the laws in force in India. The Courts of respective cluster where programme is to be implemented shall have exclusive jurisdiction in all matters arising under the contract.

18. Force Majeure

18.1 Definition

"Force Majeure Event" means any act or event that prevents the affected Party from performing its obligation in accordance with the Agreement, if such act or event is beyond the reasonable control of the affected Party and such Party had been unable to overcome such act or event with the exercise of due diligence (including the expenditure of reasonable sums). Subject to the foregoing conditions, "Force Majeure Event" shall include without limitation the following g act sore vents: (i) natural phenomena, such as storms, hurricanes, floods, lightning, volcanic eruptions and earthquakes; (ii) explosions or fires arising from lighting or other causes unrelated to the acts or omissions of the Party seeking to be excused from performance; (iii) acts of war or public disorders, civil disturbances, riots, insurrection, sabotage, epidemic, terrorist acts, or rebellion. A Force Majeure Event shall not be based on the economic hardship of either Party. In case of any damage because of force majeure event, the System shall be repaired/commissioned in line with the penal provisions of Scheme guideline/tender.

18.2 Excused Performance

Except as otherwise specifically provided in the Agreement, neither Party shall be considered in breach of the Agreement or liable for any delay or failure to comply with the Agreement (other than the failure to pay the amounts due hereunder), if and to the extent that such delay or failure is attributable to the occurrence of a Force Majeure Event; provided that the Party claiming relief under above Clause shall immediately (i) notify the other Party in writing of the existence of the Force Majeure Event, (ii) exercise all reasonable efforts necessary to minimize delay caused by such Force

Majeure Event, (iii) notify the other Party in writing of the cessation or termination of said Force Majeure Event and (iv) resume performance of its obligations hereunder as soon as practicable thereafter; provided, however, that N&RE and HAREDA shall not be excused from making any payments and paying any unpaid amounts due in respect of Vendor to N&RE and HAREDA prior to the Force Majeure Event performance interruption.

18.3 Term in ationasa Consequence of Force Majeure Event

If a Force Majeure Event shall have occurred that has affected the Vendor's performance of its obligations hereunder and that has continued for a continuous period of one hundred eighty (180) days, then N&RE and HAREDA shall be entitled to terminate the Agreement upon ninety (90) days' prior written notice to the Vendor. If at the end of such ninety (90) day period such Force Majeure Event shall still continue, the Agreement shall automatically terminate. Upon such termination for a Force Majeure Event, neither Party shall have any liability to the other (other than any such liabilities that have accrued prior to such termination).

19. **Jurisdiction of the Court:**-Any dispute between the Contractor and S&D/DNRE&H in respect of this contract shall be settled in the Court at Panchkula, Haryana only.
20. The carbon credit of the project will be the sole property of the Department and no any such claim of the successful bidders/firms will be entertained.
21. Vendors shall adhere to the guidelines for solar water pumping system issued by DNRE&HAREDA and scheme guidelines of MNRE and its amendments.
22. The final authority to decide any matter, either on reference or suomo to, will be Director General, Department of Supply & Disposals, Haryana or Director General, Department of New & Renewable Energy, Haryana & HAREDA.

23. Vendor's Indemnity

The Vendor agrees that it shall indemnify and hold harmless DNRE/HAREDA and its members, officers, employees, students, casual labourers, persons permitted to run any business or service, such as canteens, stores, photocopy units, banks, post office, courier service, hospital and to any lawful visitors (collectively, the "DNRE/HAREDA Indemnified Parties") from and against any and all Losses incurred by the DNRE/HAREDA Indemnified Parties to the extent arising from or out of the following any claim for or arising out of any injury to or death of any Person or loss or damage to property of any Person to the extent arising out of the Vendor's negligence or willful misconduct. The Vendor shall not, however, be required to reimburse or indemnify any DNRE/HAREDA Indemnified Party for any Loss to the extent such Loss is due to the negligence or willful misconduct of any DNRE/HAREDA Indemnified Party.

24. Insurance & Penalty

A. Insurance

The Goods supplied under the Contract shall be fully insured in Indian Rupees against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery. For delivery of goods at site, the insurance shall be obtained by the Contractor, for an amount not less than the Contract Price of the goods from “warehouse to warehouse” (final destinations) on “All Risks” basis including War risks and strikes.

The Comprehensive insurance of Solar Photo Voltaic Water Pumping System shall be provided for natural calamities, theft, burglary, & damage, etc. during 5 years warranty period. The empaneled bidder shall file insurance claim and shall be responsible to bring the insurance claim to a final settlement. The farmer and the empaneled bidder shall be jointly responsible for collection and submission of documents for the processing of the insurance claim. The insurance policy taken for the individual farmer shall be handed over to the beneficiary under intimation to NRE & HAREDA at the time of processing of payment for the completed installations. The empaneled company shall do renewal of insurance certificate every year up to 5 years as per insurance clause.

In case of an incident covered under insurance, bidder must replace the lost/damaged part within 7 days from the date of intimation, failing which the rectification/replacement (keeping the same configuration in consideration) will be done by NRE&HAREDA at the risk and cost of system integrator, after rectification/replacement the warranty clause will remain compliant as per tender conditions.

B. Penalty

S. No.	Default	Penalty
1	Failure to Accept Letter of Intent/Empanelment (LoI/LoE)	EMD shall be cashed and/or bidder blacklisted for 5 years.
2	Failure to sign the Agreement or submission of the PBG.	EMD shall be cashed and/or bidder blacklisted for 5 years.

3	In case of any non-execution or delay in the execution of the order or delay in maintenance beyond the stipulated time schedule decided including any extension permitted in writing.	DNRE/HAREDA reserves the right to recover from the bidder a sum equivalent to 0.5 % of the value of the delayed SPWPS installation or on the unexecuted portion of the work for each week of the delay and part thereof subject to a maximum of 10 % of the total value of the contract. The amount will be first recovered from the PBG amount and the balance will be adjusted by DNRE/HAREDA in release of payment to the concerned vendor. Further, DNRE/HAREDA may also blacklist the Empaneled firm for 5 years.
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25. Transportation, Demurrage, Wharfage, etc.

Contractor/Selected Vendor is required under the Contract to transport the Goods to place of destination defined as Site. Transport to such place of destination in India including insurance, as shall be specified in the Contract, shall be arranged by the Contractor/Selected Vendor, and the related cost shall be included in the Contract Price.

Subsequent to an order being placed against bidder's quotation, received in response to this 'enquiry', if it is found that the materials supplied are not of the right quality or not in accordance with our specifications (required by us) or received in damaged or broken conditions, not satisfactory owing to any reason of which we shall be the sole judge, SIA shall be entitled to reject the materials, cancel the contract and buy our requirement from the open market/other sources and recover the loss, if any, from the supplier reserving to ourselves the right to forfeit the security deposit, furnished by the supplier against the contract. The supplier will make his own arrangements to remove the rejected material within a fortnight of instruction to do so. Thereafter material will lie entirely at the supplier's risk and responsibility and storage charges, along with any other charges applicable, will be recoverable from the supplier.

SIA reserve the right to accept or reject any quotation in full or in part without assigning any reason thereof. We also reserve the right to split and place order on more than one supplier.

26. Liquidated damages

In case of any delay in the execution of the order or delay in maintenance beyond the stipulated time schedule decided including any extension permitted in writing, DNRE/HAREDA's reserves the right to recover from the bidder a sum equivalent to 0.5 % of the value of the delayed SPWPS installation or on the unexecuted portion of the work for each week of the delay and part thereof subject to a maximum of 10 % of the total value of the contract.

Alternatively, DNRE/HAREDA's reserves the right to purchase of the material and completion of the works including maintenance from elsewhere at the sole risk and cost of the successful bidder/ contractor and recover all such extra cost incurred by

NRE&HAREDA in procuring the material from resources available including encashment of the bank guarantee or any other sources etc. Further, if any extra cost is incurred by DNRE/HAREDA's due to delay in work completion by the party beyond the completion time as per PO/LOA, the same shall be recovered from the party's Invoice/BG/PBG etc.

Alternatively, DNRE/HAREDA may cancel the order completely or partly without prejudice to his right under the alternatives mentioned above.

27. Statutory Compliance/Certification regarding Cyber Security Products

A certificate as per format 7.15 is to be submitted by the bidders that the items offered meet the definition of domestically manufactured/produced Cyber Security Products as per MeitY notification vide File no. 1(10)/2017-CLES dt. 02.07.18. The above certificate shall be on Company's letterhead and signed by Statutory Auditor or Cost Auditor of the Company.

'Cyber Security Products means a product or appliance or software manufactured/produced for the purpose of protecting, information, equipment, devices computer, computer resource, communication device, and information stored therein from unauthorized access, use, disclosure, disruption, modification or destruction'.

28. Warranty and Maintenance

The complete Solar Photovoltaic Water Pumping System and display board / Name Plate (DNRE/HAREDA's will provide the details) shall be warranted and maintained for 05 years from the date of installation.

The maintenance service provided shall ensure proper functioning of the system as a whole. All preventive/routine maintenance and breakdown/corrective maintenance required for ensuring maximum uptime shall have to be provided by the Contractor.

Successful bidder, on whom letter of award is placed, is to ensure all safety guidelines, rules and regulations, labour laws etc. Successful bidder indemnifies NRE&HAREDA for any accident, injury met by its labour, employee or any other person working for him. Any compensation sought by its labour, employee or any other person working for him shall be paid by successful bidder as per settlement solely.

29. Declaration of Local Content

Bidder shall submit a certificate stating the percentage of local content as per the format 7.12 of tender Document. The certificate shall be from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content. It is mandatory to mention UDIN No in the certificate.

NOTE: False declarations will be in breach of the code of integrity under Rule 175(1)(i)(h) of the General Financial rules for which a bidder or its successors can be debarred for up to 2 years as per Rule 151 (iii) of the General Financial rules along with such other actions as may be permissible under law. Only those bidders who comply with the minimum local content requirement as mentioned above shall be eligible to bid.

30. Quoted Price

The quoted price shall be on F.O.R (Freight on Road) destination basis for site inclusive of all taxes/GST etc.. Price mentioned in the quotation must be firm. Hence, prices in Letter of Award/Notice to Proceed shall be firm and not subject to escalation till the execution of the complete order and its subsequent amendments accepted by the bidder even though the completion / execution of the order may take longer time than the delivery period specified and accepted in the Letter of Award.

The applicable GST is 13.8 % on Solar Power Based Devices or Solar Power Generating System, supplied with other goods and services then the value of goods shall be deemed as seventy Percent of the gross consideration charged for all such supplies i.e. to be charged at 12% GST, and the remaining thirty percent of the gross consideration charged shall be deemed as value of the said taxable services i.e. to be charged at 18% GST, thus amounting to an overall tax rate of 13.8 %. Further, if any change /amendment in thereof, same will be applicable.

31. Abnormally Low Bids

- I. An Abnormally Low Bid is one where the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the Contract for the offered Bid Price.
- II. In the event of identification of a potentially Abnormally Low Bid, S&D/DNRE/HAREDA shall seek written clarifications from the Bidder, including detailed price analyses of its Bid price in correlation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the bidding document.

After evaluation of the price analyses, in the event that S&D/DNRE/HAREDA determines that the Bidder has failed to demonstrate its capability to deliver the contract for the offered tender price, S&D/DNRE/HAREDA shall reject the Bid.

32. Inspection and Audit by the Government/MNRE/DNRE/HAREDA

All materials / equipments manufactured by the bidder/consortium of bidders against the Letter of Award shall be subject to inspection, check and/or test by the DNRE/HAREDA/MNRE or his authorized representative at all stages and place, before, during and after the manufacture.

Accordingly, all materials /equipment shall be subject to Pre-Dispatch Inspection (PDI) by DNRE/HAREDA or its authorized representatives at the manufacturing site of major components (module, pumps and controller) or at any site i.e. godown in Haryana

before their dispatch. The inspection site must have basic testing facility for testing of system as per technical specification of the tender.

During the time of PDI, test report of ordered solar pumping systems, warranty certificates and structure certificate as specified in the guidelines and specification issued by MNRE should be provided by the vendor.

If upon delivery the material/equipment does not meet the specification, the materials/equipment shall be rejected and returned to the bidder for repairs/modification etc. or for replacement and DNRE/HAREDA may also impose the penalty or/and blacklist the vendor. In such cases all expenses including the to- and-fro freight, repacking charges, any other costs etc. shall be to the account of the Vendor.

The manufacturer will submit inspection report with regard conformity to technical specifications for the items to be dispatched to work site of NRE&H. However, equipment's will be dispatched from the inspection site only after the receipt of "Dispatch Clearance" from DNRE/HAREDA or its authorized representatives after acceptance of material offered/inspection report.

C. Specific Terms & Condition/ Eligibility Criteria related to above Store:

Short listing of Bidders will be based on the following Criteria:

33. General Eligibility Criteria

Bidders participating in the Tender will be required to meet the following eligibility criteria (as applicable).

- 33.1 The Bidder shall be a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto/ proprietary/partnership firm/ Limited Liability Partnership firm. A copy of certificate of incorporation/registration etc shall be furnished along with the bid in support of above.
- 33.2 Bidding Consortium of two companies with one of the Companies as the Lead Member as per Consortium Agreement (Format 7.5) can submit bids under this Tender.
- 33.3 A foreign company cannot participate on a standalone basis or as a member of consortium under this Tender.
- 33.4 In line with the O.M. issued by the Department of Expenditure, Ministry of Finance, vide No. 6/18/2019-PPD dated 23.07.2020 and subsequent amendments and clarifications thereto, the Bidder shall meet the following criteria for its bid to be considered for evaluation under the Tender:
 - i. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority (as defined in the OM as referred above).
 - ii. "Bidder" in this reference, means any person or firm or company, including any member of a consortium, every artificial juridical person not falling in

any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in this tender.

- iii. "Bidder from a country which shares all and be order with India" for the purpose of this clause, means:
- a) An entity incorporated, established or registered in such a country; or
 - b) A subsidiary of an entity incorporated, established or registered in such a country; or
 - c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - d) An entity whose beneficial owner is situated in such a country; or
 - e) An Indian (or other) agent of such an entity; or
 - f) An natural person who is a citizen of such a country; or
 - g) A consortium where any member of the consortium falls under any of the above.
 - h) In support of the above, the Bidder shall be required to submit necessary Undertaking as per Format 7.8/7.8A of the Tender.
 - i) Other provisions of the referred OM dated 23.07.2020, except Sl. 11 of the OM, will also be applicable for this tender. Any interpretation of the above clauses will be made in line with the referred OM, including subsequent amendments and clarifications thereto.

33.5 The Bidder should not be under any liquidation, court receivership or similar proceedings on due date of submission of bid.

33.6 The Bidder or any of its Affiliates should not be a wilful defaulter to any lender, and that there is no major litigation pending or threatened against the Bidder or any of its Affiliates which are of a nature that could cast a doubt on the ability or the suitability of the Bidder to undertake the Project. The Bidder shall submit an undertaking to this effect as per format 7.7 of this Tender.

33.7 The bidder should have also a valid ISO 9001:2015 Certificate issued from any NABCB accredited certification body in the field of quoted item and copy of valid ISO 9001:2015 Certificate must be attached with offer.

34. Technical Eligibility Criteria

34.1 Under this Tender, it is proposed to promote only commercially established and operational technologies to minimize the technology risk and to achieve timely commissioning of the Projects. The Bidder is required to under take to furnish evidence of meeting the above criteria inline with provisions of the Tender. The undertaking shall be submitted as per enclosed Format 7.8.

34.2 The bidder should be, either of the following:

- a) System Integrators/ Aggregators/ Any other entities fulfilling technical and financial criteria.
- b) Any manufacturer of solar PV modules or manufacturer of solar pumps or

manufacturer of solar pump controllers.

c) Joint venture of any of manufacturers mentioned at (b) above with system integrators/aggregators.

- 34.3 Supply of 5000 Solar Pump sets or 50000 Solar Pump Controller or 50000 solar pump or 50 MW of Solar modules under any GOI/State Government programme in last three years upto to the last date of bid submission. Experience of module manufacturer should be of supplying modules, for pump manufacturers it should have experience of supplying Pumps and for pump controller it should have experience of supplying pump controller in any GOI/State Govt. programme. In case of system integrator it should have experience of supplying 5000 complete solar pumping system in any GOI/State Govt. programme in last 3 years upto to the last date of bid submission.
- 34.4 The bidder has to submit test reports of quoted capacity/ies shall be issued by the National Institute of Solar Energy and any other lab accredited by NABL for testing of solar PV water pumping system as per MNRE specifications and testing procedure.
- 34.5 The bidder has to comply with the latest MNRE scheme guidelines from the date of issue of respective guidelines for the supply of pumps/motors/panels and other equipment's from the approved list.
- 34.6 In case Bidder wishes to participate in as a Joint Venture, following conditions are additionally applicable: -
- i. The term Bidder used hereinafter would therefore apply to both a single entity and a Consortium/ Joint Venture.
 - ii. A consortium of maximum two (02) members is allowed in this Tender including one as lead bidder.
 - iii. Lead Bidder accepts primary responsibility for providing a robust and quality product meeting technical specifications of tender. Declaration regarding the lead member shall be provided in the Format 7.5. However, both the members of the Joint Venture shall be jointly and severally liable for compliance of the conditions of the tender and the PM-KUSUM Guidelines including amendments and other Orders/ directions issued by MNRE related to implementation of the Scheme.
 - iv. Any member of the Joint Venture participating in the tender shall not be permitted to participate either in individual capacity or as a member of any other Consortium/Joint Venture in the same tender. Submission or participation in more than one bid will cause disqualification of all the proposals submitted by the bidder.
 - v. All formalities in respect of submission of tender shall be done only in the name of 'Lead Member' and not in the name of Joint Venture. However, name & other details of both the members of Consortium/ Joint Venture Firm should be clearly mentioned in the Bid/Response.
 - vi. A copy of Memorandum of Understanding (MOU) executed between the members of Joint Venture shall be submitted along with the tender. The complete details of the members of the Joint Venture Firm, their share and responsibility in the Joint Venture etc. particularly with reference to financial, technical and other

obligations shall be furnished in the MOU.

- vii. Once the offer/ bid is submitted, the bid shall not be modified / altered/terminated during the period of execution including any extension thereafter by S&D/DNRE/HAREDA/MNRE or validity of any letter of award awarded to the said Consortium/Joint Venture Firm. In case, the tenderer fails to observe/comply with this stipulation, the full Security Deposit/ Performance Bank Guarantee (PBG) shall be liable to be forfeited.
- viii. A duly notarized agreement of Joint Venture Firm shall be executed between the 'Lead Member' and Consortium/Joint Venture Partner. This Agreement should be submitted in original with your offer/ bid.
- ix. Authorized Member of Joint Venture Firm: 'Lead Member' shall be authorized on behalf of Joint Venture Firm to deal with the tender/S&D/DNRE/HAREDA, sign the agreement or enter into contract in respect of the said tender, to receive payment and such activities in respect of the said tender/ contract. All notices/ correspondences with respect to the contract would be sent only to this 'Lead Member' of Joint Venture Firm.
- x. Required processing fee shall be submitted by the 'Lead Member'. Submission of processing fee by the 'Lead Member' it should be deemed as processing fee submitted by the Joint Venture Firm.
- xi. Duration of work and Joint Venture Agreement shall be valid during the entire execution period/ validity of letter of award and any extension thereafter/ currency of the contract including the period of extension, if any and 5-year maintenance contract.
- xii. Any change in constitution of Joint Venture Firm shall not be allowed.
- xiii. On award of any contract to the Joint Venture Firm, a single Performance i.e., Bank Guarantee shall be submitted by the lead bidder as per tender conditions. All the Guarantees like Security Deposit, Earnest money Deposit, Performance Guarantee, and Bank Guarantee for Mobilization Advance etc. shall be accepted only in the name of 'Lead Member' and splitting of guarantees among the members of Joint Venture shall not be permitted.
- xiv. Members of the Joint Venture Firm shall be jointly and severally liable to the MNRE/S&D/DNRE/HAREDA for execution of the project/ Work/ Assignment etc. The Joint Venture members shall also be liable jointly and severally for the loss, damages caused to the MNRE/S&D/DNRE/HAREDA during the course of execution of any awarded contract or due to non-execution of the contract or part thereof. Governing Laws for Consortium/ Joint Venture Firm: The Joint Venture Agreement in all respects shall be governed by and interpreted in accordance with Indian Laws.
- xv. In case of Consortium of NSIC, the lead members/partners in the consortium shall not separately participate as independent bidder or as members of any other consortium

in this bidding process. All bids in contravention of this shall be rejected.

- xvi. Under this tender, only bid from one NSIC Consortium will be accepted.
- xvii. All correspondence by S&D/DNRE/HAREDA will be done with 'Lead member' only.

34.7 Detailed technical parameters of the Pumps to be met by Vendors is at Annexure-A. The Bidders shall strictly comply with the technical parameters detailed in the Annexure-A. Further, the provisions as contained in the O.M. dated 10.03.2021 issued by MNRE on the subject "Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirement of Compulsory Registration) Order, 2019- Implementation-Reg." and its subsequent amendments and clarifications issued until the bid submission dead line, shall be applicable for this Tender. The modules used in the Project under this Tender should have been included in the List-under the above Order, valid as on the date of invoicing of such modules.

- 35. Copy of Factory License Indian Factories Act, 1948 or any document to establish factory in running operations under the and GST registration Certificate, supporting the fact of the bidder be in engaged in the business field mentioned shall be submitted. If factory license does not specify that business field, a separate Government issued document shall be submitted in support of the bidder being engaged in the business field mentioned.

Financial Eligibility Criteria

35.1 Net-Worth

- I. The Net Worth of the Bidder should be not less than paid up capital in last FY 2022-23, as on the last date of previous Financial Year, i.e., FY 2022-23.
- II. The net worth to be considered for the above purpose will be the cumulative net-worth of the Bidding Company or Consortium, together with the Net Worth of those Affiliates of the Bidder(s) that undertake to contribute the required equity funding and PBG in case the Bidder(s) fail to do so in accordance with the Tender.
- III. Net Worth to be considered for this clause shall be the total Net Worth as calculated in accordance with the Companies Act, 2013 and any further amendments thereto.

AND

35.2 Minimum Average Annual Turnover

The Bidder shall have a Minimum Average Annual Turnover (MAAT) of at least Rs. 120 Crore, during last three financial years, i.e., 2022-23, 2021-22, 2020-21 and profitable in at-least 2 out of above financial years. It is hereby clarified that "Other Income" as indicated in the annual accounts of the Bidder shall not be considered for arriving at the annual turnover.

- 35.3 The Bidder may seek qualification on the basis of financial capability of its Affiliate(s) for the purpose of meeting the qualification requirements as per Clauses above. In case of the Bidder being a Bidding Consortium, any Member may seek qualification on the basis of financial capability of its Affiliate. In this case, a Bidder

can use the credential of only a single affiliate to meet all the financial eligibility criteria. In such cases, the Bidder shall be required to submit Board Resolutions from the respective Affiliate, undertaking to contribute the required equity funding and Performance Bank Guarantees/POI in case the Bidder(s) fail to do so in accordance with the Tender. In case of non-availability of the Board Resolution as required above, a letter from the CEO/ Managing Director of the respective Affiliate, undertaking the above, shall be required to be submitted and the requisite Board Resolution from the Affiliate shall be required to be submitted.

- 35.4 For the purposes of meeting financial requirements, unconsolidated audited annual accounts for any three financial years out of the last five financial years shall be used. However, audited consolidated annual accounts of the Bidder may be used for the purpose of financial requirements provided the Bidder has at least twenty six percent (26%) equity in each Company whose accounts are merged in the audited consolidated account.
- 35.5 A Company/Consortium would be required to submit annual audited accounts for the last FY, 2022-23, or as on the day at least 7 days prior to the bid submission deadline, along with net worth, annual turnover, working capital certificate (if applicable) from a practicing Chartered Accountant/Statutory Auditor to demonstrate fulfillment of the criteria.

Note: In case of bidder seeking eligibility using credential of foreign Parent/Ultimate Parent/Affiliate entity, in the event the Bidder is unable to furnish the audited annual accounts for the previous financial year as per the prevalent norm in the respective country, the Bidder shall submit the annual audited accounts of the last financial year for which the audited accounts are available. This, however, would be acceptable, subject to the condition that the last date of response to this Tender falls on or within the deadline for completion of audit of annual accounts of companies, as stipulated by the laws/rules of the respective country, and the Bidder shall submit the corresponding documentary evidence against the same. In case the annual accounts or provisional accounts as on the day at least 7 days prior to the bid submission deadline, are submitted in a language other than English, a certified English translation from an approved translator shall be required to be submitted by the Bidder.

- 35.6 For meeting the above financial eligibility criteria, if the data is provided by the Bidder in a foreign currency, equivalent Indian Rupees of Net Worth and other financial parameters will be calculated by the Bidder using Reserve Bank of India's reference rates prevailing on the date of closing of the accounts for the respective financial year. In case of any currency for which RBI reference rate is not available, Bidders shall convert such currency into USD as per the exchange rates certified by their banker prevailing on the relevant date and used for such conversion. After such conversion, Bidder shall follow the procedure/ submit document as elaborated in Clause above.

35.7 In case the response to tender is submitted by a Consortium/Joint Venture, then the financial requirement is required to be met by the Consortium/Joint Venture members on an aggregate basis.

35.8 **Note:** Wherever applicable, audited accounts for the last FY, 2022-23 will be required to be submitted for meeting the qualification requirements.

Note: The format of the Technical Bid/ Index for the Technical Bid Documents will be as per Annexure-IA of this document and the bidders are requested to upload their Technical Bids on the Portal with index as provided in Annexure-IA.

In case of non submission of required Eligibility Documents as at Annexure-IA, the bid of the firm will not be considered and no further chance will be given for the submission of these documents. However, clarification, if any, of already submitted documents maybe obtained in case required as per the rules.

A. Standard Terms and Conditions (wherever applicable these terms & conditions will overrule the specific terms and conditions as at Para 'C'above):-

1. All the annexure from 'Annexure-1 to 12' including 'Schedule-B of Supply' as part of this present DNIT are available as 'Tender Forms' at Link <https://dsndharyana.gov.in/downloads/> under 'Downloads' > 'Tender Form'.

2. Procurement of Stores through Rate Contract System:-

Where ever Government considers expedient that more than one supplier/ manufacturers should be kept on rate contract, it may so decide on case to case basis subject to conditions available at Annexure '1'.

3. EMD:-

The firms are required to deposit Earnest Money as indicated above failing which the tenders are liable to be rejected. Manufacturing Micro & Small Enterprises (MSEs) of the State, Startups/ First Generation Entrepreneurs of the State, Central or Haryana Public Sector Enterprises and "approved sources" as declared by the Industries Department, Haryana, are exempt from the deposit of EMD. The condition at Sr. No. 7 of "Instructions to Tenderers of the TENDER FORM" shall be deemed to be amended to this extent as per provisions contained at Para 13(i)(ii) of G.O. No.2/2/2010-4I-BII of dated 28.05.2010 (Annexure-2), Para no 3(A)(ii) of G.O. No. 2/2/2016-4I BII (1) of dated 20.10.2016 (Annexure-3) and Sr. No. 2 of the Table of G.O. No.2/2/2016-4IB-II dated 03.01.2019 (Annexure-4) (or as amended from time to time in this regard)

The condition at Sr. No. 6 of Annexure "A" - "Conditions with TENDER FORM" shall be deemed to be cancelled. (amendments with effect from may 28, 2010)

4. Performance Security:

The successful tenderer shall be required to deposit Performance Security Deposit as per provisions contained in Govt. of Haryana G.O. No. 2/2/2016-4IBII(2) dated 20.10.2016 (Annexure-5) as under:-

Sr. No.	Type of Firm/Enterprises	Value of Performance Security Deposit
1	Haryana based firms:-	

	(i) # Haryana Based Micro and Small Enterprises (MSEs)	(i) @0.2% of the value of contract
	(ii)Haryana based other firms/enterprises	(ii) @2% of the value of contract
2	Other States/ UTs based firms	@5% of the value of contract
<i># Haryana based MSEs will be eligible for performance security deposit @ 0.2% who have filed SSI Certificate/EM Part-II/Udyog Aadhaar Memorandum (UAM)/Udyam Registration in Haryana and who participate directly in the tendered/quoted items and offering to supply the entire Work/Supply Order by their enterprise.</i>		

The performance security in excess of the EMD already deposited can be submitted in the shape of Demand Draft/Call Deposit Receipt/Banker's Cheque or in the shape of equivalent Bank Guarantee of any scheduled bank with branch in Chandigarh/ Panchkula. The condition at Sr. No. 8 of "Instructions to Tenderers of the TENDER FORM" shall be deemed to be amended to this extent as per provisions contained G.O. No. 2/2/2016-4IBII(2) dated 20.10.2016 (**Annexure-5**) (or as amended from time to time in this regard)

5. Price Fall Clause:

Price fall clause will be as per condition no. 15 of "General Conditions of Supply" as available at **Annexure-10**. The same is that the price quoted in the tender/quotation or approved in the Rate Contract for the stores shall not exceed in any way the lowest price at which the tenderer quote for the supply the stores of identical description to DGS&D, New Delhi/ State Government Institutions/Undertakings/any other person during the delivery period/currency period of the rate contract. If, at any time during the delivery period/currency period, the successful tenderer reduces the rates/sale price of the quoted stores to any person at the price lower than the price chargeable under the supply order/ rate contract, the tenderers should forthwith notify such reduction and inform this office and the price payable under the supply order/contract for the stores supplied after the date of coming into force of such reduction of the rates shall stand correspondingly reduced to that level. The successful tenderers shall promptly notify the reduction of rates to this office as well as to the concerned Indenting Officer/ Consignees. The tenderer shall also give a certificate on their bills that the rates charged by them are not in any way higher to those quoted by them to the DGS&D, New Delhi and other State Government etc., during the corresponding period. The Indenting Officer shall be required to ensure that requisite certificate is given by the concerned firm on the bills before releasing their payments.

6. **Penalty to firm on Delay in delivery:** Should the contractor fail to deliver or dispatch any consignment within the period prescribed for such delivery or dispatch stipulated in the supply order, the delayed consignment will be subject to 2% penalty per consignment per month recoverable on the value of the stores supplied. The other details will be as per provision contained in Sr. No. 14 of "Schedule- 'B' Condition of Contract".

7. The bidders are required to quote the basic rates, the delivery/ transportation costs/ applicable GST and duties etc, and the place of billing for the supply of stores clearly and separately. The bidders are required to intimate the place of billing.

8. Penalty Clause for Department/ Govt. Agencies for delay in Payment

Delay in payments to the suppliers beyond the stipulated credit period indicated in the supply order, unless supported by cogent reasons and approved by a higher authority, will attract penal interest on the defaulting amount @ Rs. 25/- per rupees one lakh per day of delay beyond the stipulated credit period. Non provision of adequate budget will be no ground for delay in payments to the supplier. This is as per provisions contained at Para 17 of G.O. No.2/2/2010-4I-

Bill of dated 28.05.2010 (or as amended from time to time in this regard)

9. Negotiation of Rates

Regarding negotiations of rates, policy issued by the State Government vide G.O. No.2/2/2010-4-IB-II dated 18.06.2013 (**Annexure-1**), G.O. No.2/2/2010-4-IB-II dated 16.06.2014 (**Annexure-6**), G.O. No.2/2/2010-4-IB-II dated 09.02.2015 (**Annexure-7**), G.O. No. 14/29/2023-6FA dated 26.05.2023 (**Annexure-7-A**) will be applicable.

10. Concession to MSMEs of State:

The State Government has notified “Haryana State Public Procurement Policy for MSME - 2016” vide G.O. No. 2/2/2016-4I BII(1) dated 20-10-2016 (**Annexure-3**) and amendment vide G.O. No. 2/2/2016-4IB-II dated 11.12.2019 (**Annexure-8**) and as amendment vide G.O. No. 2/2/2016-4IB-II dated 13.08.2021 (**Annexure-8-A**) which will be applicable in respect of concessions to Haryana based MSMEs and KVIs. For claiming the relevant concession/s like Tender Fee, Earnest Money Deposit (EMD), Turnover, Exemption in respect of Past Performance & Experience, Purchase Preference and Performance Security, the bidders are required to submit the documentary proof from Government authorities showing that they come under Haryana based manufacturing MSME/KVI units as the case may be e.g. *Entrepreneurs Memoranda in Haryana in bidder’s name and further subject to fulfillment of eligibility criteria as provided in the said Policy of 2016.

***Note:-** To claim the concessions/benefits under the above policy, the bidder is required to submit SSI Certificate/Manufacturing Entrepreneurs Memorandum (part-II) issued by the Industries Department Haryana in respect of the quoted item / Udhyog Aadhaar Memorandum (UAM)/Udhyam Registration of Haryana based manufacturing enterprises in respect of the quoted item (*Ref. Industries & Commerce Department Haryana Memo No.TS/DS&D/11389-A Dated 03.07.2018*) and further subject to fulfillment of eligibility criteria as provided in the said Policy of 2016 and amendments from time to time.

11. Concession/benefits to Startups/First Generation Entrepreneurs of State:

The State Government has notified “Concession/benefits in Public Procurement to Startups/First Generation Entrepreneurs of State” issued vide G.O. No. 2/2/2016-4I B-II dated 03.01.2019 (**Annexure-4**) (or as amended from time to time in this regard) which will be applicable in respect of concessions to Startups/First Generation Entrepreneurs of State. For claiming the relevant concession/s like Tender Fee, Earnest Money Deposit (EMD), Turnover, Exemption in respect of Past Performance & Experience, Purchase Preference and Performance Security, the bidders are required to submit the documentary proof as per the said policy.

12. In case of evidence of cartel formation by the bidder(s), the EMD is liable to be forfeited along with other actions as are permissible to Government like filing complaints with the Competition Commission of India and/ or other appropriate forums.

13. Purchase Preferences for approved Sources

The Director, Supplies & Disposals, Haryana, reserves the right to allow purchase preference to the approved sources, including Central or Haryana State Public Sector Undertakings/Enterprises, provided that such approved source takes part in the bidding process and the quoted prices of the approved source is within 10% of the lowest acceptable price, other things being equal. However, such purchase preference would be available to the approved source only at the lowest acceptable price. The latest list of Approved Source is contained in Government Order no. 6/03/2007-4IB-II dated: 14-02- 2008 (or as amended from time to time in this regard) of the Industries Department and is subject to further amendment from time to time.

14. Penalty clause for rejected samples/ material offered by the Bidder:

In case, the material offered for inspection by the firm fails to meet the specifications stipulated in NIT/Order/Contract and the samples are rejected by the Inspecting Committee, the Indenting Department will have the right to levy a penalty at 0.1% of the total order value. In case, the material offered for inspection fails during the 2nd inspection also, the Indenting Department will have the right to increase the penalty to 0.25% of the total order value. In case, the material offered fails during the 3rd and final inspection also, the firm will be liable for penal action including forfeiture of security, risk purchase, debarring/ blacklisting in future, and no further opportunity for inspection would be provided to the supplier firm.

15. Grievance Redressal Mechanism for dealing with the representations/ complaints/ letters of the participating bidders/ firms:

A time bound Grievance Redressal Mechanism for dealing with the representations/ complaints/ letters of the participating bidders/ firms in the tendering process in the State Public Procurement will be governed by State Government Policy issued vide G.O No.2/2/2016-4I-B II of dated 25.07.2016 (Annexure-9), G.O. No. 2/2/2016-4IB-II dated 27.08.2021 (Annexure-9-A) and as amendment vide G.O. No. 14/16/2023-6FA dated 19.06.2023 (Annexure-9-B). All the bidders/ firms who want to make any representation/ complaint against any issue related to their technical scrutiny of the bids may do the same within 5 working days (up to 05:00 P.M. of the Fifth Working day) of the date of issue of letter/ intimation regarding their **As per NIT/ Not as per NIT status**. They have to ensure that their communication is delivered/ reached within 5 working days and delay in postal will not be counted as a valid reason. No representation/ complaint in whatsoever manner from the bidders/ firms will be entertained after the opening of Financial Bid.

16. Preference to Make in India:- The public procurement in the State in reference to “Preference to make in India” shall be governed by Govt. Order No.02/08/2020-4IB-II dated 18.11.2020(Annexure-11)(or as amended from time to time in this regard)

17. Restriction in Public procurement from bidders of certain Countries:- The restriction on procurement from bidders from a Country or Countries on grounds of Defense of India or matters directly or indirectly related thereto including National Security shall be governed by Govt. Order No.02/09/2020-4IB-II dated 10.12.2020(Annexure-12)(or as amended from time to time in this regard).

18. Blacklisting/Debarring :- Affidavit on Non Judicial Stamp Paper duly certified by the Notary stating that EMD /Bank Guarantee of the firm [name of the firm] has not been forfeited/ blacklisted/ debarred either in Govt. Deptt./ Boards/ Corporations/ Federations/ Agencies /any Autonomous Bodies in State of Haryana , other State/ Central Government Departments/Agencies etc. as on the date of submission of the bid in the present tender.

19. Arbitration Clause

The Arbitration if any will be decided as per the provision contained at Sr. No.18 of “Schedule ‘B’ Conditions of Contract”

20. Jurisdiction

All disputes will be settled within the jurisdiction of the Head Quarters of Director, Supplies & Disposals, Haryana at Panchkula.

E. OTHER TERMS AND CONDITIONS

1. The firms are required to mention bifurcation of their rates showing the detail of Basic Rates, GST, Duties etc. in their bid. In case, the supplies are delayed by the firm beyond the

stipulated delivery period & there has been any upward revision in the rates of GST/ Duties ON THE CONTRACTED ITEM, no such increase will be allowed. However, if there has been any reduction in GST/Duties, the same will be availed. No variation in GST/ Duties on raw material will be applicable.

2. All documents to be submitted by the tenderers with their offer should be self attested in case the same are copies of original documents.
3. The Earnest money of the tenderers will be forfeited to Govt. account and blacklisting/ debarring besides other penal action, if they withdraw their offer/ rates or modify the terms & conditions of the same at any time during the validity of their offer before acceptance.
4. The Bid i.e. Technical Bid as well as Financial Bid is to be submitted online on web portal <https://etenders.gov.in/eprocure/app>. The Technical Bids uploaded on the portal should have proper indexing and page numbering on all the documents forming the Technical bid. SUPPLIES & DISPOSALS DEPARTMENT, HARYANA S.C.O. No. 09, 1st & 2nd Floor, Sector-16, Panchkula-134109 (Haryana) Ph.:- 0172-2570121, 123, 124. Fax No.:- 0172-2570122. e-mail:- supplies@hry.nic.in , website:- dsndharyana.gov.in Any supporting documents if required is to be submitted in online mode only along with their Technical Bids by due date and time.
5. The Financial bid/s of only those bidders/ items will be opened who qualify on the basis of their Technical Bids and wherever required approval of samples. The date & time of opening of the Financial bids will be intimated in the due course.
6. The offer without prescribed Earnest Money, Tender Fee & E-Service fee is liable to be summarily rejected. The deficiency in the remaining documents and tender requirement can be made subject to the decision by Director, Supplies & Disposals, Haryana, Panchkula
7. The quantity of Stores can be increased or decreased.
8. Notwithstanding anything contained in the Tender, Supplies & Disposals Department Haryana reserves the right to accept or reject any Bid, and to cancel the bid process and reject the Tender, at any time, without thereby incurring any liability to the affected Bidder or Bidders and without any obligation to inform the participating/affected Bidder (s) the reason for such decision.
9. Other terms & conditions as contained in various Annexure/ Documents as available under the folder <https://dsndharyana.gov.in/downloads/> "TENDER FORMS" as available at the link <https://dsndharyana.gov.in/downloads/> under 'Downloads' > 'Tender Form' form part of this DNIT.
10. Instructions to bidder on Electronic Tendering System. Registration of bidders on e-Procurement Portal, Information about Digital Certificate, Instructions about Online Payment of Tender Document fee/e-Service Fee/Earnest Money, Important Instructions & Help manual for online bidding and other General issues option available on Home page of NIC e-procurement portal i.e <https://etenders.hry.nic.in>. In case bidders need any clarifications or if training required to participate in online tenders they can contact office Timings of Help-desk support & Contract Details:- The detail may be seen under "Contract US" option available on Home Page of NIC eProcurement portal i.e <https://etenders.hry.nic.in>. For support related to Haryana Tenders in addition to Helpdesk:- In addition, For support related to Haryana Tenders in addition to helpdesk you may also contact to following:- E - mail: eproc.nichry@yahoo.com Desk: 0172-2700275.

Executive Engineer ,
For & on behalf of Governor of Haryana

SECTION V OTHER TERMS AND CONDITIONS AND INSTRUCTIONS

36. Instructions to Bidders

- a) Bid for empanelment of vendors for solar water pumping systems for tentative aggregated capacity as given above. The detailed bid document can be viewed and downloaded from the web-site, <https://.....>
- b) The Bidder is advised to read carefully all instructions and conditions appearing in Bid document and understand the scope of work fully. All information and documents required as per the Bid document must be furnished with bid. Failure to provide the information and/or documents as required shall render the bid unacceptable for evaluation of technical bid. All bidders qualifying technical stage shall be treated at par. Financial Bid of Bidder qualifying at technical stage only shall be opened.
- c) Bidder shall be deemed to have examined the Bid document, to have obtained information in all matters whatsoever that might affect the carrying out of the works in line with the scope of work specified in the Bid document at the bid price and to have satisfied himself of the sufficiency of his bid. The Bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved, wage structures and as to what all works Successful Bidder shall have to complete in accordance with the Bid Document irrespective of any defects, omissions or errors that may be found in Bid document.
- d) Bidders having been blacklisted by DNRE/HAREDA or by any State Govt. / PSU/Central Govt., for whatever reasons, shall not be eligible/ allowed to participate in this Bid.
- e) Bidder shall not be placed under the Negative List of MNRE as on the tender closing date.
- f) The bidding process is for empanelment of vendors for solar water pumping systems at various locations in the state of Haryana, India. However, total capacity as indicated above may go upto 1.5 times of tendered capacity, if required. Successful bidders will have to unconditionally agree to the additional quantum beyond the tendered capacity under the same terms and conditions.
- g) Bidder must meet the eligibility criteria as defined in the tender. Consortium of Companies is allowed as per the terms and conditions of the tender. Bidder will be declared as a Technically Qualified Bidder based on meeting the eligibility criteria and as demonstrated based on documentary evidence submitted by the Bidder in the Bid.
- h) The Successful Bidder shall be required to establish at least one Service Centre at district level in Haryana in operational area of vendors.
- i) The Bidders shall have to submit their bid and other required relevant documents/ certificates, if any; online only as per time schedule (Key dates). Bid other than online will not be accepted by the Nodal Agency.
- j) Bidder/firm having common director with the bidder should have not been debarred/blacklisted by any Govt. Deptt's / organization/ PSU's / institutions/

agencies/ autonomous Organizations/Ministry of Corporate Affairs. If any bidder provides false information regarding debarred /blacklisted or conceals the facts in this regard, Nodal agency reserves the right to forfeit both EMD & Performance Bank Guarantee of the bidder, to black list the bidders and also may cancel the contract.

- k) The Bidder should have valid GST & PAN registration certificate. A copy of which should be enclosed.
- l) The past performance of the firm/sister concern firm shall be considered while evaluating the technical bids. If bidder has poor record for supply & installation or for providing after sales service/ maintenance then bidder may be treated as not technical eligible.

37. Other Terms and Conditions

- a) The offer shall be submitted online only. No tender will be accepted in physical form.
- b) Before submission of online bids, the bidder must ensure that scanned copies of all the necessary documents have been uploaded with the bid. All the document uploaded must be legible, illegible documents will not be considered.
- c) Nodal Department/Agency will not be responsible for any delay in online submission of bids due to any reason whatsoever.
- d) The price quoted should be FOR anywhere in the State of Haryana inclusive of all taxes and duties, custom duty, excise duty, service tax, sales tax, C.S.T., local taxes, GST, Income Tax, Surcharge on income tax etc. if any, including 05 years warranty (or as notified in the bid) of the complete system/ plant. A supplier/ contractor shall be entirely responsible for all taxes, duties, license fees, etc. All taxes payable as per Government income tax & service tax norms will be payable by the contractor. If any new tax/duty is levied during the contract period the same will be borne by the firm exclusively. TDS will be deducted from the payment of the contractor as per the prevalent laws and rules of Government of India and Government of Haryana state in this regard.
- e) Material shall be strictly as per tender specifications. If there is any left out specification, the same shall be considered as per the latest specifications applicable as per MNRE/ BIS/International Standards.
- f) In case of any ambiguity in interpretation of any of the clauses/ provision of the said rate contract/DNIT, the decision of the Director General, DNRE or Director General, Supplies & Disposals Department Haryana shall be final and binding.
- g) It shall be the sole responsibility of the contractor to get verified the quality & quantity of the supplied material at the site of delivery.
- h) The Contractor shall indemnify the DNRE against all third party claims of Infringement of patent, royalty's trademark or industrial design rights arising from use to the goods or any part thereof.
- i) Contractors, wherever applicable, shall after proper painting, pack and crate all the equipment in such manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till time of installation. Contractor shall be held responsible for all damage due to improper packing/handling.

- j) All demurrage, wharfage and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the contractor.
- k) The goods supplied under the contract shall be fully insured against loss or damage incidental to manufacture or acquisition, transportation, shall be included in the bid price.
- l) DGS&D/DNRE may at any time terminate the contract by giving written notice to the contractor without compensation to the contractor, if it becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the NRE/HAREDA.
- m) NRE/HAREDA/DGS&D, may by written notice sent to the supplier, terminate the contract, in whole or in part at any time for its convenience.
- n) To assist in the examination, evaluation and comparison of bids the DGS&D may at its discretion ask the bidder for a clarification of its bid. The request for clarification and the response shall be in writing.
- o) At any time prior to the submission of the tender or prior to the opening of the technical bids, the DGS&D may, for any reason, whether at its own initiative or in response to a clarification requested by the Bidder, modify the Tender documents by amendment/corrigendum.
- p) Any material /instrument required to complete /successful running of the project which is not mentioned in the DNIT will be provided by the bidder in the quoted rates only and no additional payment shall be made.
- q) Not more than one tender should be submitted by one contractor or by a firm of contractors for the same work.
- r) Under no circumstances will a father or his son or their close relation or the partner of one firm be allowed to tender as separate tender. A breach of this condition will cause the tenders of such parties liable for rejection, forfeiture of their earnest money and the firm may be black listed.

The firm (s) tendering shall clearly mention in their tender whether any of the close/near relative of their management/management of sister concerned firms is in the employment of the HAREDA/Department of New & Renewable Energy, Haryana and in case their close/near relative is in employment of the HAREDA/Department of New & Renewable Energy, Haryana then his/her name, designation and place of posting to be mentioned.

If the tendering firm do not disclose and furnish the correct information as required in above clause, then his earnest money and/or Performance Security Deposit may be forfeited and in case the contractor has been awarded the work, the same may be cancelled. For concealing any information the firm may be black listed.

Note:

The word "Close/ Near Relative" mentioned in the above clause means father, mother, brother, sister, brother-in-law, sister-in-law, daughter-in-law, daughter, father-in-law, mother-in-law,son, son-in-law, first cousin of

self/spouse, spouse, father-in-law and mother-in-law of son/daughter.

- s) Income Tax/Cess will be deducted at source from contractor' bills/dues in accordance with latest Govt. orders from time to time. The contractor will have no objection to this effect.
- t) The manufacturer shall supply all technical literature and drawing considered necessary for the installation, operation and maintenance of the equipment and its fittings.
- u) The firm shall put up display board as per specification required in the tender, whereas asked by the HAREDA, duly painted at site indicating salient features like year of installation, capacity of system, cost, technology, important technical parameters etc. along with the names of MNRE, Gol and HAREDA as the sponsoring agency after approval of the same from HAREDA.
- v) EMD is liable to be forfeited in case of evidence of cartel formation by the bidder(s). Further, in case where cartel formation amongst the bidders is apparent, complaint shall be filed with the Competition Commission of India and/or other appropriate forum. EMD is liable also to be forfeited in case of submitting forged/false/fabricated documents.
- w) DGS&D reserve the rights to verify the claimed capacity of the bidder, at any stage, from their owner through a third party. Bidder/successful supplier will have to extend all cooperation. If the claim of the bidder is found negative, then DGS&D may consider reject/cancel the bid/contract.
- x) *Bidder who is manufacturer of Solar PV Modules or Solar Cells or solar pump or solar pump controller (to be used in the system) and manufacturing the said item (s) in its unit and having valid test report of, tested as per MNRE, GOI latest guidelines/BIS for minimal technical specifications of the tender document in its own name (the bidder) issued by MNRE/NABL/IEC accredited testing center and participating independently in said tender shall be treated as manufacturer for getting the benefits of concession under MME/MSME*

policy of Haryana State. The test report shall be issued by the date of closing of the tender and shall be valid as on date of opening of the technical bid. The bidder shall have manufacturing facility of the said item, with testing facility, in its unit and submit the purchase bills of manufacturing and testing facilities with said bid.

(Documents to be uploaded: Test certificate of the solar pump having component manufactured by bidder (i.e. Solar PV Modules or Solar Cells or pump) in the name of bidder and purchase bills of manufacturing and testing facilities of said component with said bid.

38. Instructions to Bidders for Structuring of Bid Proposals in Response to Tender

The bidder including its Parent, Affiliate or Ultimate Parent or any Group Company shall submit single response to tender. Detailed Instructions to be followed by the bidders for online submission of response to tender are stated in the tender. Submission of bid proposals by Bidders in response to tender shall be in the manner described below:

- i. Covering Letter as per **Format 7.1**.
- ii. In case of a Bidding Consortium, a Power of Attorney in favour of the Lead Member issued by the other Members of the Consortium shall be provided in original as perform at attached here to as **Format 7.2**.
- iii. **Format 7.3** Format for Performance Bank Guarantee (PBG).
- iv. Board Resolutions, as per prescribed formats enclosed as per **Format 7.4** duly certified by the Company Secretary or the Director of the relevant Bidder, as applicable to the Bidder and mentioned hereunder:
 - a. Board Resolution from the Bidding Company or the Lead Member of the Consortium, as the case may be, in favour of the person signing the response to Tender and in the event of selection of the Projects. Board Resolution from each of the Consortium Members in favour of the person signing Consortium Agreement.
 - b. Board Resolution from the Bidding Company committing 100% (One Hundred Percent) of the equity requirement for the Project/ Board Resolutions from each of the Consortium Members together in aggregate committing to 100% (One Hundred Percent) of equity requirement for the Project (in case of Bidding Consortium); and
 - c. Board Resolutions from each of the Consortium Members and Lead member contributing such additional amount over and above the percentage limit (specified for the Lead Member and other member in the Consortium Agreement) to the extent becoming necessary towards

The total equity share in the Project Company, obligatory on the part of the Consortium pursuant to the terms and conditions in the Consortium Agreement.

- v. In case of a Consortium, the Consortium Agreement between the Members in the Consortium as per **Format 7.5** along with Board resolution from each Member of the Consortium for participating in Consortium.
- vi. Format for Financial Requirements as per **Format 7.6** along with the certificate from practicing Chartered Accountant/Statutory Auditors

showing details of computation of the financial credentials of the Bidder.

- vii. Undertaking regarding no willful default and no major litigation pending as per **Format7.7**.
- viii. A disclosure statement as per **Format7.8/7.8A** regarding participation of any related companies in the bidding process.
- ix. **Format7.9** Declaration by bidder.
- x. Covering letter for the financial bid as per **Format 7.10**.
- xi. Declaration regarding banning, liquidation, court receivership etc. as per **Format 7.11**.
- xii. Declaration for the local content as per **Format 7.12**.
- xiii. Declaration for using same make of equipment's as per the test certificate as per

Format 7.13.

- xiv. **Format 7.14** Declaration by bidder regarding qualification.
- xv. Certificate regarding compliance of MeitY notification vide file no.1(10)/2017- CLES dt.02.07.18 as per **Format 7.15**.
- xvi. **Format7.16** General particulars of the bidder.
- xvii. **Format7.17** Litigation History.
- xviii. Declaration regarding the different Models of Solar Water Pumping Systems specified in the MNRE Specification for the particular category/type of the pumps **Format 7.18**.
- xix. Experience for supply, installation and commissioning (contracts executed, completed and handed over) of off-grid solar water pump details **Format 7.19**.
- xx. Experience certificate format for supply, installation and commissioning (contracts executed, completed and handed over) of off-grid solar water pump **Format 7.20**.
- xxi. Sample financial bid **Format 7.21**.
- xxii. Technical Bid format/Index for the Technical Bid documents **Format7.22**.
- xxiii. Attachments
 - i. Memorandum of Association, Article of Association of the Bidder needs to be attached along with the bid. The bidder should also highlight the

relevant provision which highlights the objects relating to Power/ Energy/ Renewable Energy/ Solar Water Pumping Station/Solar Power plant development/Manufacturer of pump-sets, solar panels and controllers.

- In case, there is no mention of the above provisions in the MoA/ AoA of the Bidder, the same has to be amended and submitted, if the bidder is selected as Selected Vendor.
- If these l ected vendor wishes to execute the project through a Special Purpose Vehicle (SPV), the MoA/AoA of the SPV highlighting the relevant provision which highlights the objects relating to Power/ Energy/ Renewable Energy/ Solar Water Pumping Station/ Solar Power plant development/ Manufacturer of pump-sets, solar panels and controllers has to be submitted.

- ii. Certificate of Incorporation of Bidding Company/ all member companies of Bidding Consortium.
- iii. A certificate of shareholding of the bidding company, its Parent and Ultimate Parent (if any) duly certified by a practicing Chartered Accountant/ Company Secretary as on a date within 30 days prior to the last date of bid submission. S&D/DNRE/HAREDA reserves the right to seek additional information relating to shareholding in promoter companies, their parents/ ultimate parents and other group companies to satisfy themselves that Tender conditions have been complied with and the bidder will ensure submission of the same within the required time- lines.
- iv. Certified copies of annual audited accounts for the financial year, i.e., FY2022-23, and provisional audited accounts, along with certified copies of Balance Sheet, Profit & Loss Account, Schedules and Cash Flow Statement supported with bank statements as on the date at least 7 days prior to the due date of bid submission (if applicable), shall be required to be submitted.
- v. Details of all types of securities/instruments which are pending conversion into equity whether optionally or mandatorily.

39. Important Notes and Instructions to Bidders

- 41.1 Wherever information has been sought in specified formats, the Bidders shall fill in the details as per the prescribed formats and shall refrain from any deviations and referring to any other document for providing any information required in the prescribed format.
- 41.2 The Bidders shall be shortlisted based on the declarations made by them in relevant schedules of Tender.
- 41.3 If the Bidder/ Member in a Bidding Consortium conceals any material information or makes a wrong statement or misrepresents facts or makes a misleading statement in its response to Tender, in any manner whatsoever, S&D/DNRE/HAREDA reserves the right to reject such response to Tender and/ or cancel the Letter of Award, if issued, and the Bank Guarantee/POI provided up to that stage shall be encashed. Bidder shall be solely responsible for disqualification based on their declaration in the submission of response to Tender.

- 41.4 Response submitted by the Bidder shall become the property of the S&D/DNRE/HAREDA and S&D/DNRE/HAREDA shall have no obligation to return the same to the Bidder.
- 41.5 All documents of the response to tender (including Tender and sub sequent Amendments/Clarifications/Addenda)submitted on line must be digitally signed by the person authorized by the Board as per Format 7.4.
- 41.6 The response to tender shall be submitted as mentioned in Clause16 of the tender. no change or supplemental information to a response to tender will be accepted after the scheduled date and time of submission of response to Tender. However, S&D/DNRE/HAREDA reserves the right to seek additional information from the Bidders, if found necessary, during the course of evaluation of the response to tender.
- 41.7 The Bidder shall make sure that the correct, valid and operative Pass-Phrase to decrypt the relevant Bid-part is submitted into the 'Time Locked Electronic Key Box (EKB)'after the deadline of Bid submission, and be fore the commencement of the Online Tender Opening Event (TOE) of Technical bid.
- 41.8 All the information should be submitted in English language only. In case of bidders or their foreign affiliate having documents in other than English language, then the documents shall be translated in English language by certified translator and submitted.
- 41.9 Bidders shall mention the name of the contact person and complete address and contact details including email address which shall be active for the period of 07 years in their covering letter.
- 41.10 Response to tender that is incomplete, which do not substantially meet the requirements prescribed in this tender, will be liable for rejection by S&D/DNRE/HAREDA.
- 41.11 Response to tender not submitted in the specified formats will be liable for rejection by S&D/DNRE/HAREDA.
- 41.12 Bidders delaying in submission of additional information or clarifications sought will be liable for rejection.
- 41.13 Non-submission and/ or submission of incomplete data/ information required under the provisions of tender shall not be construed as waiver on the part of S&D/DNRE/HAREDA of the obligation of the Bidder to furnish the said data/information unless the waiver is in writing.
- 41.14 Only District Court Panchkula shall have exclusive jurisdiction in all matters pertaining to this tender.
- 41.15 All the financial transactions to be made with S&D/DNRE/HAREDA including delay charges, and any additional charges (if required), shall attract applicable GST on Each transaction, irrespective of the same being mentioned in the tender.

SAMPLE FORMS & FORMATS FOR BID SUBMISSION

The following formats are required to be submitted as part of the Tender. These formats are designed to demonstrate the Bidder’s compliance with the Qualification Requirements set forth in Section 4 and other submission requirements specified in the Tender.

Format 7.1

COVERING LETTER

(The Covering Letter should be submitted on the Letter Head of the Bidding Company/Lead Member of Consortium)

Ref.no. _____

Date: _____

From: _____ (Insert name and address of Bidding Company/Lead Member of Consortium)

Tel.#:

Fax#:

E-mail address# To

The Director General,

Department of Supplies& Disposals, Panchkula.

Sub: Response to Tender No.....dated.....for (Insert title of the Tender)

Dear Sir/Madam,

We, the undersigned..... [Insert name of the ‘Bidder’] having read, examined and understood in detail the Tender including Qualification Requirements in particular, hereby submit our response to Tender.

We confirm that in response to the aforesaid Tender, neither we nor any of our Ultimate Parent Company/Parent Company/Affiliate/Group Company has submitted response to tender other than this response to tender, directly or in directly, in response to the

aforesaid tender (as mentioned in Format 7.8 under Disclosure) **OR** We confirm that in the response to the aforesaid tender, we have a Group Company who owns more than 10% but less than 26% in the bidding company as well as other companies who may participate in this Tender, and accordingly, we have submitted requisite undertaking as per Format 7.8A in this regard {strike out whichever not applicable}.

We are submitting our response to the Tender as:

Type of Bidder	Applicability(Yes/No)
Pump/Pump set Manufacturer	
Solar PV Module Manufacturer	
Solar Pump Controller Manufacturer	
Joint Venture	

In case of Joint Venture:

Lead Bidder	Non-Lead Bidder
EPC/Pump Manufacturer/ Solar PV Module Manufacturer/ Solar Pump Controller Manufacturer	EPC/Pump Manufacturer/ Solar PV Module Manufacturer/Solar Pump Controller Manufacturer

We are submitting application for the installation of SPWPS (s) in following Categories:-

S.No	Capacity of Pumps Quoted for (Such as 3HPAC/DC, 5HPAC/DC,7.5 HPAC/DC, 10HP AC/DC,)
1	

- We give our unconditional acceptance to the Tender, dated [Insert date indd/mm/yyyy], issued by S&D/DNRE/HAREDA. In token of our acceptance to the Tender along with the amendments and clarifications issued by S&D/DNRE/HAREDA, the same have been digitally signed by us and enclosed with the response to Tender. Further, we confirm that the SPWPS shall be installed within the deadline as per panel provisions of scheme guidelines and tender.
- Earnest Money Deposit(EMD):-()
We have submitted EMD of INR.....(Insert Amount)through RTGS/NEFT transactionno.....
- We hereby declare that in the event our bid get selected and we are not able to submit Bank Guarantee of the requisite value(s) towards PBG, within due time as required in this tender, S&D/DNRE/HAREDA shall have the right to encash the EMD/PBG submitted by us and return the balance amount (if any) for the value of EMD pertaining to unsuccessful capacity.
- We have submitted our response to tender strictly as per Section 7 (Sample Forms and Formats) of this Tender, without any deviations, conditions and without mentioning any assumptions or notes in the said Formats.
- Acceptance:-We here by unconditionally and irrevocably agree and accept that

the decision made by S&D/DNRE/HAREDA in respect of any matter regarding or arising out of the Tender shall be binding on us. We here by expressly waive and withdraw any deviations and all claims in respect of this process.

We also unconditionally and irrevocably agree and accept that the decision made by S&D/DNRE/HAREDA in respect of award of SPWPS in line with the provisions of the tender, shall be binding on us.

6. Familiarity with Relevant Indian Laws & Regulations:-
We confirm that we have studied the provisions of the relevant Indian Laws and Regulations as required to enable us to submit this response to Tender, in the event of our selection as Selected Vendor.
7. We are submitting our response to the Tender with formats duly signed as desired by you in the tender online for your consideration.
8. It is confirmed that our response to the tender is consistent with all the requirements of submission as stated in the tender, including all clarifications and amendments and subsequent communications from S&D/DNRE/HAREDA.
9. The information submitted in our response to the Tender is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our response to the tender.
10. We confirm that all the terms and conditions of our Bid are valid upto(Insert date in dd/mm/yyyy) for acceptance [i.e., a period upto the date as on 12months from the last date of submission of response to Tender].

11. **Contact Person**

Details of the representative to be contacted by S&D/DNRE/HAREDA are furnished as under:

Name :
Designation :
Company :
Address :
Phone Nos. :
Mobile Nos. :
Fax Nos. :
E-mail address:

Alternate Contact Person

Details of the representative to be contacted by S&D/DNRE/HAREDA are furnished as under:

Name :
Designation :
Company :
Address :

Phone Nos.:.....

Mobile Nos. :.....

Fax Nos.:.....

E-mail address:.....

12. We have neither made any statement nor provided any information in this Bid, which to the best of our knowledge is materially inaccurate or misleading. Further, all the confirmations, declarations and representations made in our Bid are true and accurate. In case this is found to be incorrect after our selection as Selected Vendor, we agree that the same would be treated as our event of default.

Dated the _____ day of _____, Thanking you,

We remain,

Yours faithfully,

Name, Designation, Seal and Signature of Authorized Person in whose name Power of Attorney/Board Resolution/ Declaration.

Format 7.2

FORMAT FOR POWER OF ATTORNEY

(Applicable Only in case of Consortiums)

(To be provided by each of the other members of the Consortium in favor of the Lead Member)

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper of Appropriate Value)

KNOW ALL MEN BY THESE PRESENTS THAT M/s.....having its registered office at.....,....., and M/s having its registered office at, (Insert names and registered offices of all Members of the Consortium) the Members of Consortium have formed a Bidding Consortium named.....(Insert name of the Consortium if finalized) (herein after called the 'Consortium') vide Consortium Agreement dated.....and having agreed to appoint M/s.....as the Lead Member of the said Consortium do hereby constitute, nominate and appoint M/s.....as a company incorporated under the laws of.....and having its Registered/Head Office at a soundly constituted lawful Attorney (hereinafter called as Lead Member) to exercise all or any of the powers for and on behalf of the Consortium in regard to submission of the response to tender no.....

We also authorize the said Lead Member to undertake the following acts:

- i) To submit on behalf of Consortium Members response to Tender.
- ii) To do any other acts to submit any information and documents related to the above response to Tender Bid.

It is expressly understood that in the event of the Consortium being selected as Selected Vendor, this Power of Attorney shall remain valid, binding and irrevocable until 05 years from installation.

We as the Member of the Consortium agree and undertake to ratify and confirm all whatsoever the said Attorney/Lead Member has done on behalf of the Consortium Members pursuant to this Power of Attorney and the same shall bind us and deemed to have been done by us.

IN WITNESS WHEREOF M/s....., as the Member of the

Consortium have executed these presents on this.....day of under the Common Seal of our

company.

For and on behalf of Consortium Member
M/s.....

----- (Signature of person authorized by the board)

(Name
Designation
Place:
Date:)
Accepted

(Signature, Name, Designation and Address

Of the person authorized by the board of the Lead Member) Attested

(Signature of the executant)

(Signature & stamp of Notary of the place of

execution) Place:.....

Date:

Lead Member in the Consortium shall have the controlling shareholding in the Company as defined in the tender, Definition of Terms of the Tender.

Format 7.3

FORMAT FOR PERFORMANCE BANK GUARANTEE (PBG)

(To be submitted separately o reach Project)

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper of Appropriate Value)

Reference:..... Bank Guarantee No.:.....

Date:.....

Inconsideration of the_____ [Insert name of the Bidder] (hereinafter referred to as 'selected Vendor') submitting the response to tender interalia for [Insert

Title of the Tender] for the State/UTs declared in Format7.1, in response to the Tender dated...issued

by Department of New & Renewable Energy, Haryana/ Haryana Renewable Energy Development Agency (here in after referred to as S&D/DNRE/HAREDA) and S&D/DNRE/HAREDA considering such response to the Tender of [Insert name of the Bidder] (which expression shall unless repugnant to the context or meaning thereof include its executers, administrators, successors and assignees) issuing Letter of Award No. to_____
_____ (Insert Name of selected Vendor) as per terms of Tender, M/s_____ {a Special Purpose Vehicle (SPV) formed for this purpose}, if applicable].

As per the terms of the Tender, the_____ [Insert name & address of Bank] here by agrees unequivocally, irrevocably and unconditionally to pay to S&D/DNRE/HAREDA at_____
_____ [Insert Name of the Place from the address of the S&D/DNRE/HAREDA] forth with on demand in writing from S&D/DNRE/HAREDA or any Officer authorized by it in this behalf, any amount up to and not exceeding Indian Rupees_____ [Total Value] only, on behalf of M/s _____ [Insert name of the selected Vendor].

This guarantee shall be valid and binding on this Bank upto and including..... and shall not be terminable by notice or any change in the constitution of the Bank or the term of contract or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variation so r alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement. Our liability under this Guarantee is restricted to INR _____ (Indian Rupees_____ Only).

Our Guarantee shall remain in force until.....S&D/DNRE/HAREDA shall be titled to invoke this Guarantee tillThe Guarant or Bank here by agrees and acknowledges that S&D/DNRE/HAREDA shall have a right to invoke this BANK GUARANTEE in part or in full, as it may deem fit.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand by S&D/DNRE/HAREDA, made in any format, raised at the above-mentioned address of the Guarantor Bank, to make the said payment to S&D/DNRE/HAREDA.

The Guarantor Bank shall make payment here under on first demand without restriction or conditions and notwithstanding any objection by _____ [Insert name of the selected Vendor] and/or any other person. The Guarantor Bank shall not require S&D/DNRE/HAREDA to justify the invocation of this

BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against S&D/DNRE/HAREDA in respect of any payment made hereunder.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the court sat _____ shall have exclusive jurisdiction.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANKGUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly S&D/DNRE/HAREDA shall not be obliged before enforcing this BANKGUARANTEE to take any action in any court or arbitral proceedings against the selected Vendor, to make any claim against or any demand on the selected Vendor or to give any notice to the selected Vendor or to enforce any security held by S&D/DNRE/HAREDA or to exercise, levy or enforce any distress, diligence or other process against the selected Vendor.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to INR (Indian Rupees _____ Only) and it shall remain in force untilWe are liable to pay the guaranteed amount or any part thereof under this Bank

Guarantee only if S&D/DNRE/HAREDA serves upon a written claim order and. Signature:

Name: _____

Power of Attorney No.: _____ For

_____ [Insert Name and Address of the Bank]

Contact Details of the Bank:

E-mail ID of the Bank:

Banker's Stamp and Full Address.

Dated this ____ day of ____, 20__

Witness:

1.....Signature

Name and Address

2.....Signature

Name and Address

Notes:

1. The Stamp Paper should be in the name of the Executing Bank and of appropriate value.
2. The Performance Bank Guarantee shall be executed by any of the Scheduled Commercial Banks as listed on the website of Reserve Bank of India (RBI) and amended as on the date of issuance of Bank Guarantee. Bank Guarantee issued by foreign branch of a Scheduled Commercial Bank is to be endorsed by the Indian branch of the same bank or State Bank of India (SBI).

Format 7.4

FORMATFORBOARDRESOLUTIONS

The Board, after discussion, at the duly convened Meeting on [Insert date], with the consent of all the Directors present and in compliance of the provisions of the Companies Act,1956or Companies Act 2013, as applicable, passed the following Resolution:

1. **RESOLVED THAT** Mr./Ms..... ,be and is here by authorized todoon our behalf, All such acts, deeds and things necessary in connection with or incidental tooour response to Tender vide Tender No..... for (insert title of the Tender), including signing and submission of all documents and providing information/ response to Tender to Department of New & Renewable Energy, Haryana/ Haryana Renewable Energy Development Agency (S&D/DNRE/HAREDA), representing us in all matters before S&D/DNRE/HAREDA, and generally dealing with S&D/DNRE/HAREDA in all matters in connection with our bid for the said Project. **(To be provided by the Bidding Company or the Lead Member of the Consortium)**
2. **FURTHER RESOLVED THAT** pursuant to the provisions of the Companies Act, 1956 or Companies Act, 2013, as applicable and compliance thereof and as permitted under the Memorandum and Articles of Association of the Company, approval of the Board be and is hereby accorded to invest total equity in the Project. **(To be provided by the Bidding Company)**

[Note: In the event the Bidder is a Bidding Consortium, in place of the above resolution at Sl. No.2,the following resolutions are to be provided]

FURTHER RESOLVED THAT pursuant the provisions of the Companies Act, 1956 or Companies Act, 2013, as applicable and compliance thereof and as permitted under the Memorandum and Articles of Association of the Company, approval of the Board be and is hereby accorded to invest (%) equity [Insert the % equity commitment as specified in Consortium Agreement] in the Project. **(To be provided by each Member of the Bidding Consortium including Lead Member such that total equity is 100%)**

FURTHER RESOLVED THAT approval of the Board be and is hereby accorded to participate in consortium with M/s ----- [Insert the name of other Members in the Consortium] and Mr/Ms....., be and is hereby authorized to execute the Consortium Agreement.**(To be provided by each Member of the Bidding Consortium including Lead Member)**

And

FURTHER RESOLVED THAT approval of the Board be and is hereby accorded to contribute such additional amount over and above the percentage limit (specified for the Lead Member in the Consortium Agreement) to the extent becoming necessary towards the total equity share in the Project Company, obligatory on the part of the Consortium pursuant to the terms and conditions contained in the Consortium Agreement dated.....executed by the Consortium as per the provisions of the Tender. **[To be passed by the Lead Member of the Bidding Consortium]**

Certified True Copy

(Signature, Name and Stamp of Company Secretary) Notes:

- a. This certified true copy should be submitted on the letterhead of the Company, signed by the Company Secretary/ Director.
- b. The contents of the format may be suitably re-worded indicating the identity of the entity passing the resolution.
- c. This format may be modified only to the limited extent required to comply with the local regulations and laws applicable to a foreign entity submitting this resolution. For example, reference to Companies Act, 1956 or Companies Act, 2013 as applicable may be suitably modified to refer to the law applicable to the entity submitting there solution. However, in such case, the foreign entity shall submit an unqualified opinion issued by the legal counsel of such foreign entity, stating that the Board resolutions are in compliance with the applicable laws of the respective jurisdictions of the issuing Company and the authorizations granted there in are true and valid.

Format7.5

FORMAT FOR CONSORTIUM AGREEMENT

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper of Appropriate Value)

This Consortium Agreement (“Agreement”) executed on this _____ Day of _____ Two Thousand _____ between M/s _____ [Insert name of Lead Member]

A Company incorporated under the laws of _____ and having its Registered Office at _____ (herein after called the “Member-1”, which expression shall include its successors, executors and permitted assigns) and M/s

_____ a Company incorporated under the laws of _____ and having its Registered Office at _____ (hereinafter called the “Member-2”, which expression shall include its successors, executors and permitted assigns), [The Bidding Consortium should list the details of all the Consortium Members] for the purpose of submitting response to Tender and **execution of contact agreement with S&D/DNRE/HAREDA** (in case of award), against Tender No. _____ dated _____ issued by Department of Supplies & Disposals for New & Renewable Energy, Haryana/ Haryana Renewable Energy Development Agency (S&D/DNRE/HAREDA).

WHEREAS, each Member individually shall be referred to as the “Member” and all of the Members shall be collectively referred to as the “Members” in this Agreement.

WHEREAS S&D/DNRE/HAREDA desires to install SPWPS under Tender for (insert title of the Tender); WHEREAS, S&D/DNRE/HAREDA had invited response to Tender vide its Request for

_____ Selection (Tender) dated

WHEREAS the Tender stipulates that in case response to Tender is being submitted by a Bidding Consortium, the Members of the Consortium will have to submit a legally enforceable Consortium Agreement in a format specified by S&D/DNRE/HAREDA wherein the Consortium Members have to commit equity investment of a specific percentage for the SPWPS.

NOW THEREFORE, THIS AGREEMENT WITNESSES THAT AS UNDER:

In consideration of the above premises and agreements all the Members in this Bidding Consortium do hereby mutually agree as follows:

1. We, the Members of the Consortium and Members to the Agreement do here by unequivocally agree that Member-1 (M/s.), shall act as the Lead Member as defined in the Tender for self and agent for and on behalf of Member-2, and to submit the response to the Tender.

2. The Lead Member is hereby authorized by the Members of the Consortium and Members to the Agreement to bind the Consortium and receive instructions for and on their behalf.
3. Notwithstanding anything contrary contained in this Agreement, the Lead Member shall always be liable for the equity investment obligations of all the Consortium Members i.e., for both its own liability as well as the liability of other Members.
4. The Lead Member shall be liable and responsible for ensuring the individual and collective commitment of each of the Members of the Consortium in discharging all of their respective equity obligations. Each Member further undertakes to be individually liable for the performance of its part of the obligations without in any way limiting the scope of collective liability envisaged in this Agreement.
5. Subject to the terms of this Agreement, the share of each Member of the Consortium will be as under

Name	Percentage
Member1	---
Member2	---
Total	100%

6. In case of any breach of any equity investment commitment by any of the Consortium Members, the Lead Member shall be liable for the consequences thereof.
7. Except as specified in the Agreement, it is agreed that sharing of responsibilities as aforesaid and equity investment obligations there to shall not in any way be a limitation of responsibility of the Lead Member under these presents.
8. It is further specifically agreed that the financial liability for equity contribution of the Lead Member shall not be limited in any way so as to restrict or limit its liabilities. The Lead Member shall be liable irrespective of its scope of work or financial commitments.
9. This Agreement shall be construed and interpreted in accordance with the Laws of India and courts at Panchkula alone shall have the exclusive jurisdiction in all matters relating thereto and arising there under.
10. It is hereby further agreed that in case of being selected as the Selected Vendor, the Members do hereby agree that they shall furnish the Performance Guarantee in favour of S&D/DNRE/HAREDA in terms of the tender.
11. It is further expressly agreed that the Agreement shall be irrevocable and shall form an integral part of the Contract Agreement and shall remain valid until the expiration of early termination of the Contract Agreement in terms thereof, unless expressly agreed to the contrary by S&D/DNRE/HAREDA.
12. The Lead Member is authorized and shall be fully responsible for the accuracy and

veracity of the representations and information submitted by the Members respectively from time to time in the response to tender.

13. It is hereby expressly understood between the Members that no Member at any given point of time, may assign or delegate its rights, duties or obligations under the Contract Agreement except with prior written consent of S&D/DNRE/HAREDA.
14. This Agreement
 - a) Has been duly executed and delivered on behalf of each Member here to and constitutes the legal, valid, binding and enforceable obligation of each such Member;
 - b) sets forth the entire understanding of the Members here to with respect to the subject matter hereof; and
 - c) may not be amended or modified except in writing signed by each of the Members and with prior written consent of S&D/DNRE/HAREDA.
15. All the terms used in capitals in this Agreement but not defined herein shall have the meaning as per the tender.

IN WITNESS WHEREOF, the Members have, through their authorized representatives, executed these present on the Day, Month and Year first mentioned above.

For M/s[Member1]

(Signature, Name & Designation of the person authorized vide Board Resolution Dated

_____)

Witnesses:

1)Signature-----

2)Signature-----

Name:

Name:

Address:

Address:

For M/s[Member2]

(Signature, Name & Designation of the person authorized vide Board Resolution Dated

_____)

Witnesses:

1)Signature-----

2)Signature-----

Name:

Name:

Address:

Address:

Signature and stamp of Notary of the place of execution

FORMAT FOR FINANCIAL REQUIREMENT

Format 7.6

(This should be submitted on the Letter Head of the Bidding Company/Lead Member of Consortium)

Ref.No. _____

Date: __

From: _____ (Insert name and address of bidding Company/Lead Member of Consortium)

Tel.#:

Fax#:

E-mail address#

To

The Director General,
Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to Tender No. _____ dated _____ for _____

Dear Sir/ Madam,

We certify that the Bidding Company/Member in a bidding Consortium is meeting the financial eligibility requirements as per the provisions of the Tender. Accordingly, the Bidder, with the support of its Affiliates, (strikeout if not applicable) is fulfilling the minimum Net Worth criteria, by demonstrating a Net Worth of Rs.....Cr. (.....in words) as on the last date of Financial Year 2022-23.

This Net Worth has been calculated in accordance with instructions provided in the Tender.

Exhibit(i): Applicable in case of Bidding Company

For the above calculations, we have considered the Net Worth by Bidding Company and/ or its Affiliate(s) as per following details:

Name of Bidding Company	Name of Affiliate(s) Whose net worth is to be considered	Relationship With Bidding Company*	Net Worth (in Rs. Crore)
Company1			
Total			

*The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/ chartered accountant is required to be attached with the format.

Exhibit(ii):Applicable in case of Bidding Consortium

(To be filled by each Member in a Bidding Consortium separately)

Name of Member: [Insert name of the Member]

For the above calculations, we have considered Net Worth by Member in Bidding Consortium and/or its Affiliate (s) per following details:

Name of Consortium Member Company	Name of Affiliate(s) whose net worth is to be considered	Relationship with Bidding Company* (If any)	Net Worth (in Rs. Crore)	Equity Commitment(in %age)in Bidding Consortium
Company1				
Company2				
Total				

* The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/chartered accountant is required to be attached with the format

Further, we certify that the Bidding Company/ Member in the Bidding Consortium, with the support of its Affiliates, (strike out if not applicable) is fulfilling the Minimum Average Annual Turnover Criteria, by demonstrating a MAAT of INR ___(_____ in words) for the three Financial Years, namely, and_____.

Exhibit(i): Applicable in case of Bidding Company

For the above calculations, we have considered the MAAT by Bidding Company and/ or its Affiliate(s) as per following details:

Name of Bidding Company	Name of Affiliate(s) whose AT is to be considered	Relationship with Bidding Company *	AT (in Rs. Crore) FY 2020-21	AT (in Rs. Crore) FY 2021-22	AT(in Rs.Crore) FY 2022-23
Company 1					
Total					

*The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/chartered accountant is required to be attached with the format.

Exhibit(ii):Applicable in case of Bidding Consortium

(To be filled by each Member in a Bidding Consortium separately)

Name of Member: [Insert name of the Member]

For the above calculations, we have considered MAAT by Member in Bidding Consortium and/ or its Affiliate(s) as per following details:

Name of Consortium Member Company	Name of Affiliate (s) whose AT is to be considered	Relationship with Bidding Company* (If Any)	AT(in Rs. Crore)FY2020-21	AT (in Rs. Crore) FY 2021-22	AT(in Rs. Crore) FY20 22-23	Equity Commitment(in %age)
Company 1						
Company 2						
Total						

* The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/chartered accountant is required to be attached with the format

Further, we certify that the Bidding Company/ Member in the Bidding Consortium, with the support of its Affiliates, (strike out if not applicable) is fulfilling the Profitability Criteria, by demonstrating a Profitability of INR_____ (____in words) for the two Financial Years, namely and _____.

Exhibit(i):Applicable in case of Bidding Company

For the above calculations, we have considered the Profitability by Bidding Company and/ or its Affiliate(s) as per following details:

Name of Bidding Company	Name of Affiliate (s) whose PBDIT is to be considered	Relations hip with Bidding Company *	PBDIT (in Rs. Crore) FY2020- 21	PBDIT (in Rs. Crore) FY2021- 22	PBDIT (in Rs. Crore)FY2022 -23
Company 1					
Total					

*The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/chartered accountant is required to be attached with the format.

Exhibit(ii):Applicable in case of Bidding Consortium

(To be filled by each Member in a Bidding Consortium separately)

Name of Member: [Insert name of the Member]

For the above calculations, we have considered Profitability by Member in Bidding Consortium and/or its Affiliate(s) as per following details:

Name of Consortium Member Company	Name of Affiliate(s) whose PBDIT is to be considered	Relationship with Bidding Company* (If Any)	PBDIT (inRs.Crore)FY2020- 21	PBDIT (in Rs.Crore) FY2021-22	PBDIT (in Rs.Crore) FY 2022-23	Equity Commitment (in% age) in Bidding Consortium
Company 1						
Company 2						
Total						

* The column for “Relationship with Bidding Company” is to be filled only in case the financial capability of Affiliate has been used for meeting Qualification Requirements. Further, documentary evidence to establish the relationship, duly certified by a practicing company secretary/chartered accountant is required to be attached with the format

#PBDIT: Profit before Depreciation Interest and Taxes

(Signature & Name of the Authorized Signatory)

(Signature and Stamp of CA)
Membership No.

Regn. No. of the CA's
Firm: UDIN:

Date:

Note: (i) Along with the above format, in a separate sheet on the letterhead of the Chartered Accountant's Firm, provide details of computation of Net Worth and Annual Turnover duly certified by the Chartered Accountant.

(ii)Certified copies of Balance sheet, Profit & Loss Account, Schedules and Cash Flow Statements are to be enclosed in complete form along with all the Notes to Accounts.

UNDERTAKING

(To be submitted on the letter head of the Bidder)

FORMAT 7.7

We, hereby provide this undertaking to Department of Supplies and Disposals/New & Renewable Energy, Haryana/ Haryana Renewable Energy Development Agency, in respect to our response to Tender No. _____ dated _____, that M/s _____ (insert name of the Bidder), or any of its Affiliates is not a willful defaulter to any lender, and that there is no major litigation pending or threatened against M/s _____ (insert name of the Bidder) or any of its Affiliates which are of a nature that could cast a doubt on the ability or the suitability of the Bidder to undertake the Project.

(Name and Signature of the Authorized Signatory)

Format 7.8

FORMATFORDISCLOSURE

(To be submitted on the Letter Head of the Bidding Company/Each Member of Consortium)

DISCLOSURE

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidding Company/Lead Member of Consortium)

Tel. #:

Fax #:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to Tender No. _____ dated for _____

Dear Sir/ Madam,

We hereby declare and confirm that only we are participating in the Tender Selection process for the tender no. _____ dated _____ and that our Parent, Affiliate or Ultimate Parent or any Group Company with which we have direct or indirect relationship are not separately participating in this selection process.

We further declare that the above statement is true & correct. We undertake that if at any stage it is found to be incorrect, in addition to actions applicable under the Tender including but not limited to cancellation of our response to this Tender and LoA, we, i.e. M/s _____ (enter name of the bidding company/ member in a consortium), including our Parent, Ultimate Parent, and our Affiliates shall be suspended/ debarred from participating in any of the upcoming tenders issued by S&D/DNRE/HAREDA for a period of 2 years from the date of default as notified by S&D/DNRE/HAREDA.

We also understand that the above is in addition to the penal consequences that may follow from the relevant laws for the time being in force.

We further declare that we have read the provisions of the Tender, and are complying with the requirements as per the referred OM dated 23.07.2020 except Sl.11 of the OM, including subsequent amendments and clarifications there to. Accordingly, we are also enclosing necessary certificates (Annexure to this format) in support of the above compliance under the tender. We understand that in case of us being selected under this Tender, any of the above certificates is found false, S&D/DNRE/HAREDA shall take appropriate action as deemed necessary.

We further declare that we are fully aware of the binding provisions of the ALMM Order and the Lists(s) there under, while quoting the price in Tender for (Enter the name of the Tender).

We further understand that the List-I(Solar PV Modules) of ALMM Order, Annexure-I of the OM, issued by MNRE on 10th March, 2021 will be updated by MNRE from time to time. We also understand that the Modules to be procured for this project, shall be from the List-I of the ALMM Order applicable on the date of invoicing of such modules.

We also further understand and accept that we shall be liable for penal action, including but not limited to blacklisting and invocation of Performance Bank Guarantee, if we are found not complying with the provisions of ALMM Order, including those mentioned above.

Dated the _____ day of _____, 20....

Thanking you,

We

remain,

Yours faithfully,

Name, Designation, Seal and Signature of Authorized Person in whose name Power of Attorney/
Board Resolution/ Declaration.

Format 7.8 A

FORMAT FOR DISCLOSURE

(To be submitted on the Letter Head of the Bidding Company/Each Member of Consortium)

(To be submitted by all such bidders in which a common Company/companies directly/in directly own(s) more than 10% but less than 26% shareholding)

DISCLOSURE

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidding Company/Lead Member of Consortium)

Tel.#:

Fax#:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to Tender No. _____ dated for _____.

Dear Sir/Madam,

We hereby declare and confirm that in terms of the definitions of the Tender, M/s _____ (enter name of the common share holder) is our Group Company, and has a direct/indirect shareholding of less than 26% in the bidding company. M/s _____ (enter name of the common shareholder) also holds directly/indirectly less than 26% shareholding in other Companies which may participate in this Tender, i.e., Tender No. _.

We undertake that M/s _____ (enter name of the above common shareholder) is not a party to the decision-making process for submission of response to this Tender by M/s _____ (enter name of the bidding company/member in the consortium). We further undertake that while undertaking any action as part of our response to Tender, we are not complicit with other such bidders participating in this Tender, in which M/s _____

_____ (enter name of the common shareholder) has less than 26% direct/ indirect shareholding, if any.

We further declare that the above statement is true & correct. We undertake that if at any stage it is found to be incorrect, in addition to actions applicable under the Tender including but not limited to cancellation of our response to this Tender and LoA, we, i.e. M/s____ (enter name of the bidding company/member in a consortium), including our Parent, Ultimate Parent, and our Affiliates shall be suspended/debarred from participating in any of the upcoming tenders issued by S&D/DNRE/HAREDA for a period of 2 years from the date of default as notified by S&D/DNRE/HAREDA.

We also understand that the above is in addition to the penal consequences that may follow from the relevant laws for the time being in force.

We further declare that we have read the provisions of the tender, and are complying with the requirements as per the referred OM dated 23.07.2020 except Sl. 11 of the OM, including subsequent amendments and clarifications thereto. Accordingly, we are also enclosing necessary certificates (Annexure to this format) in support of the above compliance under the Tender. We understand that in case of us being selected under this Tender, any of the above certificates is found false, S&D/DNRE/HAREDA shall take appropriate action as deemed necessary.

We further declare that we are fully aware of the binding provisions of the ALMM Order and the Lists(s) there under, while quoting the price in Tender for (Enter the name of the Tender).

We further understand that the List-I (Solar PV Modules) of ALMM Order, Annexure-I of the OM, issued by MNRE on 10th March, 2021 will be updated by MNRE from time to time. We also understand that the Modules to be procured for this project shall be from the List-I of the ALMM Order applicable on the date of invoicing of such modules.

We also further understand and accept that we shall be liable for penal action, including but not limited to blacklisting and invocation of Performance Bank Guarantee, if we are found not complying with the provisions of ALMM Order, including those mentioned above.

Dated the _____ day of _____, 20....

Thanking you,

We remain,

Yours faithfully,

Name, Designation, Seal and Signature of Authorized Person in whose name Power of Attorney/Board Resolution/ Declaration.

Annexure to Format 7.8/7.8A

DECLARATION

RESTRICTION ON PROCUREMENT FROM CERTAIN COUNTRIES: Mo FOM No 6/18/2019-PPD dated 23.07.2020

(To be submitted on the Letter Head of the Bidding Company/Each Member of Consortium)

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidding Company/Member of Consortium)

Tel.#: _____

Fax#: _____ E-mail address# _____

To

The Director General,

Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to the Tender Nodated.....

Dear Sir/Madam,

This is with reference to attached order No.OM no.6/18/2019-PPD dated 23rd July 2020 issued by Department of Expenditure, MoF, Govt. of India.

We are here by submitting the following declaration in this regard:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I here by certify that this bidder fulfils all requirements in this regard and is eligible to be considered. Where applicable, evidence of valid registration by the Competent Authority shall be attached."

We further declare that the above statement is true & correct. We are aware that if at any stage it is found to be incorrect, our response to the tender will be rejected.

Dated the _____ day of _____, 20....

Thanking you,

We remain,

Yours faithfully,

Name, Designation, Seal and Signature of Authorized Signatory.

Enclosure: OM dated 23.07.2020, as referred above

DECLARATION BY THE BIDDER
(To be submitted on letter head of Bidder)

Format 7.9

Reference No:

Date:

To

The Director,
Supplies & Disposals Department,
Panchkula (Haryana),

Subject: Design, Supply, Erection, Testing, Installation & Commissioning of Off-Gid Solar Water Pumping Systems including comprehensive maintenance for a period of 05 years, in the Haryana.

Madam/Sir,

1. We have read and examined the tender documents relating to the subject cited works (here in after referred to as "Works") as issued by you:
2. Having examined the Tender Documents and being duly authorized we, hereby, bid for the execution, and completion of the Works referred to in the Tender Documents upon the terms and conditions contained or referred to therein and in accordance to all respects with the specifications and other details given therein.
3. 'PURCHASER' and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this Bid, and to seek clarifications from our bankers and employers regarding any financial and technical aspects. This Bid shall also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information to provide such information deemed necessary and as requested by you to verify statements and information provided in this application, such as the resources, experience, and competence of the Bidder.
4. We agree to keep this Bid open for acceptance for 365 days from the date of opening of Financial Bid, or such other extended period as may be required by you and also agree not to make any modifications in its terms and conditions of our own accord.
5. We agree if we fail to keep the validity of Bid open, as aforesaid, or we make any modification in the terms and conditions of our Bid of our own accord or after the acceptance of our Bid if we fail to execute an Agreement as prescribed in the Tender Documents or commence the execution of the works as provided in the Tender Documents, we shall become liable for forfeiture of the Earnest Money Deposit. In such an event you shall, without prejudice to any other right or remedy, be at liberty to forfeit the Earnest Money Deposit absolutely and take other actions as per terms & conditions of the contract.
6. We certify that the Bid submitted by us is strictly in accordance with the terms, conditions, specifications etc. as contained in the Tender Documents, and it is further certified that it does not contain any deviations to the aforesaid documents.
7. The bid is made with the full understanding that:-
 - a) Bids by qualified bidders will be subject to verification of all information submitted for qualification at the time of bidding

- b) PURCHASER reserves the right to:
- (i) Amend the scope and value of any work bid under this tender.
 - (ii) Reject or accept any application, cancel the tender process and reject all bidders by giving a written notice.
8. PURCHASER shall not be liable for any actions taken under (b) i and ii above.
 9. We undertake, if our bid is accepted, and on receipt of the work order to commence the works and to complete and deliver the whole of works comprised in the contract within the period stated and in compliance with the tender documents.
 10. If our bid is accepted, we will furnish Performance Security Deposit as per terms & conditions mentioned in DNIT.
 11. We understand that you are not bound to accept the lowest or any bid you may receive.
 12. All the major items as required in the tender should be indigenously made as per requirement of the tender.
 13. We are capable of executing and completing the work as required in the tender.
 14. We accept all risks and responsibilities directly or indirectly connected with the performance of the tender.
 15. We have no collusion with other Bidder, any employee of HAREDA/DNRE or with any other person or firm in the preparation of the bid.
 16. We have not been influenced by any statement or promises of HAREDA/DNRE or any of its employees, but only by the tender document.
 17. We are financially solvent and sound to execute the work.
 18. We have sufficient experience and competent to perform the contract to the satisfaction of HAREDA/DNRE.
 19. We are familiar with all general and special laws, acts, ordinances, rules and regulations of the Municipal, District, State and Central Government that may affect the work, its performance or personnel employed therein.
 20. Our company has never been debarred from similar type of work by HAREDA/DNRE and or any of the Government undertaking/Department.
 21. We assure to execute the tendered work as per specifications, terms and conditions of the contract. If awarded to us.
 22. The undersigned declare that the statements made and the information provided in the Bid including the completed applications and formats are complete, true, and correct in all aspects.

We have gone through carefully all the Bid conditions and solemnly declare that we will abide by any penal action such as disqualification or black listing or termination of contract or any other action deemed fit, taken by, the Department against us, if it is found that the statements, documents, certificates produced by us are false / fabricated.

Date of Submission: (Signature of the Bidder) (Seal)

Place:

Format 7.10

FORMAT FOR SUBMISSION OF FINANCIAL BID

(The Covering Letter should be submitted on the Letter Head of the Bidding Company/Lead Member of Consortium)

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidding Company/Lead Member of Consortium)

Tel.#:

Fax#:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to tender No. _____ dated _____ for _____.

Dear Sir/Madam,

I/We, _____ (Insert Name of the Bidder) enclose herewith the Price Bid/Financial Proposal for selection of my/our firm, in line with the Price Bid Schedule enclosed herewith.

I/We have applied for SPWPS to beset up in Haryana for.....nos. under this tender.

I/We agree that this offer shall remain valid for a period upto the date as on 12 months from the due date of submission of the response to tender and such further period as may be mutually agreed upon.

Dated the _____ day of _____, 20....

Thanking you,

We _____ remain, Yours faithfully,

Name, Designation, Seal and Signature of Authorized Person in whose name Power of Attorney/
Board Resolution/ Declaration

Notes:

1. For each line item (i.e., type of pump), there can be only one price applied for by the Bidder. If the bidder quotes two prices or combination thereof for the line item, then the bid shall be considered as non-responsive.
2. If the bidder submits the financial bid online with the instructions mentioned therein, then the bid shall be considered as non-responsive.
3. Price requirement shall be quoted as a fixed amount in Indian Rupees only. Conditional proposal shall be summarily rejected.
4. In the event of any discrepancy between the values entered in figures and in words, the values entered in words shall be considered.
5. Price should be in Indian Rupee upto two decimal places only.

Format 7.11

DECLARATION REGARDING BANNING, LIQUIDATION, COURT RECEIVERSHIP ETC.

(To be submitted on the Letter Head of the Bidder)

Ref. No. _____

Date: _____

From: _____ (Insert name and address of Bidder) Tel.#: Fax#:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana Sector-16, Panchkula.

Sub: Response to Tender No. _____ dated _____ for _____.

Dear Sir/Madam,

We hereby confirm that we are not on Banning List by S&D/DNRE/HAREDA or Public Sector Project Management due to poor performance or Corrupt/ Fraudulent/ Collusive/ Coercive Practices or any other reason or banned by Government department/ Public Sector on due date of submission of bid.

Further, we confirm that neither we nor our allied agency(ies) are on banning list of S&D/DNRE/HAREDA or the Ministry of New & Renewable Energy.

We also confirm that we are not under any liquidation, court receivership or similar proceedings or bankruptcy.

In case it comes to the notice of S&D/DNRE/HAREDA that we have given wrong declaration in this regard, the same shall be dealt as Fraudulent Practices and we shall be banned by S&D/DNRE/HAREDA for a period which shall be decided by S&D/DNRE/HAREDA on case-to-case basis as per tender /instructions/precedence etc.

Further, we also confirm that in case there is any change in status of the declaration prior to award of contract, the same will be promptly informed to S&D/DNRE/HAREDA by us.

(Name and Signature of the Authorized Signatory)

Format 7.12

DECLARATION FOR THE LOCAL CONTENT

(To be submitted on the Letter Head of the Bidder/Lead member)

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidder) Tel. #:

Fax #: _____ E-mail address # _____

To

The Director General,

Department of Supplies & Disposals, Haryana Sector-16, Panchkula.

Sub: Response to tender No. _____ dated _____ for _____.

Dear Sir/Madam,

We declare that we will be using indigenously manufactured solar panels with indigenous solar cells and modules. Further, we are agreeing to accept and follow Guidelines for the implementation of PM-KUSUM scheme issued by MNRE on 22-07-2019 and its subsequent amendment(s).

We are aware that in accordance with order no. F. No. 283/22/2019-GRID SOLAR dated 09.02.2021 issued by MNRE, only class-I Local Suppliers' are eligible to bid under this Tender. Also, we have carefully gone through the above mentioned order to understand the whole process and definitions of various terms (Class-I Local Supplier, Local Content etc.) pertaining to above referred order and its supporting appendix and annexure as amended till date.

Further, we hereby undertake that I/We certify that we/our Collaborator/JV Partner are/is are not being under debar list/undergoing debarment period on account of breach of the code of integrity under Rule 175 (1) (i) (h) of the General Financial Rules for giving false declarations of local content.

List of imported components used in the manufacturing of solar water pumping system:

S.No.	Item Imported

(Name and Signature of the Authorized Signatory of the bidder/lead member)

Format 7.13

DECLARATION FOR USING SAME MAKE OF EQUIPMENTS AS PER THE TEST CERTIFICATE

(To be submitted on the Letter Head of the Bidder)

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidder) Tel.#:

Fax#:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana Sector-16, Panchkula.

Sub: Response to tender no. _____ dated _____ for _____.

Dear Sir/Madam,

We are agreeing to accept that the same make of solar panels, pumps, VFD/inverter/controller for which the test report is submitted in the tender, as per **MNRE's latest revised solar pump testing procedure issued in 2023** and amendments thereof, will be supplied by us.

In case, if some different make of solar panels, pumps, VFD/inverter/controller will be supplied during the implementation or AMC period, we will submit the test report for that particular make component(s). We also agree that such test reports shall be issued by the National Institute of Solar Energy and any other lab accredited by NABL for testing of solar PV water pumping system as per MNRE specifications and testing procedure.

(Name and Signature of the Authorized Signatory)

Format 7.14

DECLARATION BY THE BIDDER REGARDING QUALIFICATIONS

I/ we hereby declare that:

1. I/we possess the necessary professional, technical, financial and managerial resources and competence required by the Bidding Document issued by the Procuring Entity;
2. I/we have fulfilled my/our obligation to pay such of the taxes payable to the Union and the State Government or any local authority as specified in the Bidding Document;
3. I/we are not insolvent, in receivership, bankrupt or being wound up, not have my/our affairs administered by a court or a judicial officer, not have my/our business activities suspended and not the subject of legal proceedings for any of the foregoing reasons;
4. I/we do not have, and our directors and officers not have, been convicted of any criminal offence related to my/our professional conduct or the making of false statements or misrepresentations as to my/our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment proceedings;
5. I/we do not have a conflict of interest as specified in the Act, Rules and the Bidding Document, which materially affects fair competition;

SIGNATURE OF AUTHORISED
SIGNATORY OF THE BIDDER
WITH SEAL

Date:
Name:
Designation:
Address:

Format 7.15

CERTIFICATE REGARDING COMPLIANCE OF MeitY NOTIFICATION
VIDEFILENO.1(10)/2017-CLESdt. 02.07.18

(To be submitted on the Letter Head of the Bidder)

Ref.No. _____

Date: _____

From: _____ (Insert name and address of Bidder) Tel.#:

Fax#:

E-mail address#

To

The Director General,

Department of Supplies & Disposals, Haryana Sector-16, Panchkula.

Sub: Response to tender no. _____ dated _____ for _____.

Dear Sir/Madam,

This is to certify that the products/items being of fered/quoted against tender no. d
ated

.....by M/smeet the definition of domestically
manufactured/ produced Cyber Security Products as per Para 4 of MeitY notification vide File
no.1(10)/2017-CLES dt. 02.07.18 and the bidder shall strictly abide by all provisions of the
subject notification.

Thanking you, Yours faithfully,

Signature(Statutory Auditor or Cost Auditor)

.....

Printed

Name... UDIN

.....

Format 7.16

GENERAL PARTICULARS OF BIDDER

Bid for Design, Supply, Erection, Testing, Installation & Commissioning of Off-Grid Solar Water Pumping Systems, including comprehensive maintenance for a period of 05 years, in the Haryana.

1.	Name of firm	
2.	Postal Address	
3.	Telephone, Telex, FaxNo	
4.	E-mail	
5.	Website	
6.	Category of Bidder/ Company incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership firm/LLP firm <i>A copy of certificate of incorporation shall be furnished alongwith the bid in support of above.</i>	
7.	Category of the Bidder (as required in the tender) I. Manufacturer of Solar PV Module or II. Manufacturer of Solar Pump or III. Manufacturer of Solar Pump Controller using indigenous technology or IV. EPC/System Integrator/Aggregator	
8.	Whether, the bidder (<u>manufacturer of solar module/solar cell/solar pump/Pump Controller in Haryana</u>) is any one of the following : (i) Manufacturing Micro & Small Enterprises (including Khadi& Village Industries) or (ii) Manufacturing Medium Enterprises (including Khadi& Village Industries) <i>If, the bidder Manufacturing Small & Medium Enterprises (including Khadi& Village Industries) or Manufacturing Micro Enterprises (including Khadi& Village Industries), then please mention the device/item(solar module/Solar cell)for</i>	

	<i>which it is registered in Haryana. A copy of certificate of Entrepreneurs Memorandum/UDYOG AADHAR as per requirement of tender should be furnished alongwith the bid in support of above.</i>	
8.1	Quality Certification of ISI/ISO/ Ag Mark/ Quality mark issued form competent authority in State or Central Govt. in respect of the items/goods mentioned in the tender(Provide the required certification No. and upload the certificate with the bid).	
8.2	Is the bidder registered with DGS&D/ NSIC/ GOI Department/ State Govt. Department/ GOI PSUs/ State Govt. PSUs in respect of the items/goods mentioned in the tender.(Yes/No, if yes, upload the Certificate with the bid)	
9.	Name of Directors of Company (atleast Two directors with email IDs& contact Numbers)	(i) (ii)
10.	Name & designation of the authorized Signatory to whom reference shall be made	
11.	Present activities/ business of the firm i. Module/Cell Manufacturer ii. Pump Manufacturer lii Pumps Controller Manufacturer iii. System Integrator	
12.	Registration number	
	GST No.	
	PAN	
	TAN	
13.	Place& State of billing	
14.	Have the contractor/firm to pay arrears of income tax? If yes upto what amount?	
15.	Have the contractor/ firm/firms having common director ever been debarred by any Govt. Deptt./Public Sector Undertakings for Undertaking any work?	
16.	Monthly capacity of supply, installation & Commissioning of the systems.	
17.	Bid offered for Capacity (Bidder has to bid for full capacity)	
18.	Average annual turnover of the bidder as Required in the tender(Rs. in Lakh)	
19.	The bidders have net worth not less than the Paid up capital in the previous Financial Year	

	As required in the tender. (Yes/No)	
20.	Experience of the bidder as required in the tender (verified by any Govt. department/organisation)	
21.	<i>Make(s) of Modules offered for the system:</i>	i..... , ii. iii. iv. v.
22.	<i>Make(s) of Pumps offered for the system:</i>	i., ii. iii. iv. v.
23.	<i>Make(s) of Pumps controller offered for the system:</i>	I., II. III. IV. V.
24.	The detail of capacity/ies for which test Reports submitted/price quoted	
25.	The detail of manufacturing and testing facilities for solar module or solar cell or pump or pump controller (name, make, model number etc.)	
26.	Name of the any close/near relative of any employee/ office bearer/management of bidder company working in New & Renewable Energy Department, Haryana or HAREDA	Name Designation Place of Posting Relationship
27.	Litigation history	
28.	Any Other Information	

We solemnly declare that we are aware of binding provisions of the ALMM Order of MNRE and the List(s) there under.

We solemnly declare that we will abide by any penal action such as disqualification or black listing or termination of contract or any other action deemed fit, taken by, the Nodal agency against us, if it is found that the information, statements, documents, certificates produced by us are false / fabricated or any information is concealed therein.

Date

With SEAL

(Signature of Bidder)

Format 7.17

LITIGATION HISTORY

Name of bidder

Year	Award for or Against bidder	Name of client	Cause of litigation and matter of dispute	Disputed amount (Current value in Rs.)	Actual awarded Amount (In Rs.)

1. Bidders should provide information on any history of litigation arbitration resulting from contracts executed in the last five years or currently under execution.

Signature with seal of bidder

Format 7.18

DECLARATION REGARDING THE DIFFERENT MODELS OF SOLAR WATERPUMPING SYSTEMS SPECIFIED IN THE MNRE SPECIFICATION FOR THE PARTICULAR CATEGORY/TYPE OF THE PUMPS

(To be provided on the letter head of the bidder or lead member at the time of bid submission) RefNo. _____ Date: _____

From: _____ (Insert name and address of Bidding Company/Lead Member of Consortium)

Tel.#: _____ Fax#: _____ E-mail address# _____

To

The Director General,
Department of Supplies & Disposals, Haryana
Sector-16, Panchkula.

Sub: Response to Tender No. _____ dated _____ for _____.

Vide this declaration this is to certify that M/s..... (Name of the Bidder) has all the models (e.g. Model-5, Model-6 & Model-7, it is mentioned w.r.t. 5HP-AC-Submersible pump) of the Solar Water Pumping System as specified in the table, category/type-wise of the pumps (5HP-AC-Submersible) as per the MNRE revised specifications issued in .2023 (latest), for which the firm is participating in the bid for the various state(s) and will furnish the required test reports and details of the models specified: Shut Off-Head (meters), Dynamic-Head (meters), Water output (Liters per day), No. of stages in the model, diameter of each stage of the respective model, Diameter of the discharge pipe (in inches) in the tender for supply of such pumps.

The details of the different models which are to be supplied by the firm:

S.No.	Type/Category of the pump	Model no. as per MNRE Specification, to be supplied by the firm

I,, on behalf of M/s..... (Name of the Bidder) am aware, without any doubt, that any deviation of the above information with the information provided to S&D/DNRE/HAREDA/MNRE at the time of signing of agreement would invite penalties such as forfeiture of EMD by S&D/DNRE/HAREDA and/ or blacklisting of firm for the period of 5 years from the date of the issue of the Notice for the blacklisting.

Thanking you,

We remain,

Yours faithfully,

Name, Designation, Seal and Signature of Authorized Person in whose name Power of Attorney/
Board Resolution/Declaration.

Format 7.19

EXPERIENCE FOR SUPPLY, INSTALLATION AND COMMISSIONING (CONTRACTS EXECUTED, COMPLETED AND HANDED OVER) OF OFF-GRID SOLAR WATER PUMP DETAILS

S r . n o	Finan cial year	Awarding Agency	Descrip tion of work	SWPS experience supply, installed & commissioned			Work order		Work completi on date	Client certificate attached at page no.
				SWPS installed &commissi oned	Supply of Motor pump & controller	Supplyof PV modules (Experienc e in kWp)	No. & Date	Am ounti n Rs. in Lacs		
1										
2										
3										
4										
5										
6										
7										

Note:

1. Nos., Off-grid Solar water pump wise, work order value, project year and commissioning date shall be described in experience certificate.
2. Bidders must upload copies of work order, work completion report with satisfactory performance. Document may be got verified by S&D/DNRE/HAREDA.
3. In case of solar pump/ controller/ PV Module supplied in Government tender, manufacturer/bidder must upload copies of, client certificate on letter head, work completion report with satisfactory performance issued by Government Department. Document may be got verified by S&D/DNRE/HAREDA.
4. In case of JV, the experience of both partners shall be submitted in requisite format to fulfill requisite experience.

Format7.20

**EXPERIENCE CERTIFICATE FORMAT FOR SUPPLY, INSTALLATION AND COMMISSIONING
(CONTRACTS EXECUTED, COMPLETED AND HANDED OVER) OF OFF- GRID SOLAR WATER PUMP**

(to be provided on the letter head of the concerned Government Department)

Government Department Name..... No.

..... Date

To whomso ever it may concern

This is to certify that M/s(Name of the Bidder) was empanelled with (concerned Government Department with full name& address) during year The firm has installed the solar pump sets as given below:

Sr. no	Project Year	Description of work	Manufacturer/ Make details			Detail of supply, installed & commissioned SWPS			
			Module /PV	Pump-Motor	Controller/Inverter	HP	Surface /Submersible	AC/ DC	No.
Exp.	2020-21	PM-KUSUM Component B standalone solar water pump programme							
1									
2									

All pumps are working satisfactory.

Signature of Nodal officer with stamp

(Name of authorized signatory, designation)

Format 7.21**Sample Financial Bid Format**

Sr No	Pump Capacity (HP)	Pump Type	Pump Position	Controller Type	Basic rate	GST (13.8%)	Total Rates
1	3	DC	Submersible	Normal (Without USPC)			
2		DC	Submersible	with USPC			
3		DC	Surface	with USPC			
4	5	DC	Submersible	Normal (Without USPC)			
5		DC	Surface	Normal (Without USPC)			
6		DC	Submersible	with USPC			
7		DC	Surface	with USPC			
8	7.5	DC	Surface	Normal (Without USPC)			
9		DC	Submersible	with USPC			
10		DC	Surface	with USPC			
11	10	DC	Surface	Normal (Without USPC)			
12		DC	Surface	with USPC			
Total							

Note: The rates shall be submitted online only.

Annexure-'A'

SPECIFICATION FOR SOLAR PHOTOVOLTAIC WATER PUMPING SYSTEMS

1. SCOPE

These specification covers design qualifications and performance specifications for Centrifugal Solar Photo Voltaic (SPV) Water Pumping Systems from 1HP (0.75kW) to 25 HP (18.75 kW) suitable for bore-well, open well, water reservoir, water stream, etc., and specifies the minimum standards to be followed under MNRE Schemes.

2. TERMINOLOGY

In addition to the terminology specified in IS 5120 and IEC 62253, the following shall also apply.

2.1 Static Water Depth — It is the depth of water level below the ground level when the pump is not in operation.

2.2 Draw-Down — It is the elevation difference between the depth of static water level and the consistent standing water level in the bore-well during the operation the of pump set.

2.3 Submergence — It is the minimum height of the water level after drawdown above the pump suction casing.

2.4 Manometric Suction Lift — Manometric suction lift is the vacuum gauge/suction manometer reading in the meter of the water column when the pump operates at suction lift.

2.5 Static Suction Lift — Suction lift/head is the vertical distance between sump water level and center of pump inlet.

2.6 Daily Water Output — It is the total water output on a clear sunny day with three times tracking of SPV modules, under the "Average Daily Solar Radiation" condition of 7.15 KWh / m² on the surface of SPV array (i.e., coplanar with the SPV Modules).

2.7 Wire to Water Efficiency — It is the combined system efficiency of SPV Module, Converter/Controller with Inbuilt MPPT mechanism, Motor-Pump set and piping.

2.8 SPV Pump Controller — Pump Controller converts the DC voltage of the SPV array into a suitable DC or AC, single or multi-phase power and may also include equipment for MPPT, remote monitoring, and protection devices.

2.9 Maximum Power Point Tracker (MPPT) — MPPT is an algorithm that is included in the pump controller used for extracting maximum available power from SPV array under a given condition. The voltage at which SPV array can produce maximum power is called 'maximum power point' voltage (or peak power voltage).

3. CONSTRUCTIONAL FEATURES

3.1 General

3.1.1 SPV Water Pumping System set uses the irradiance available through SPV array. The SPV array produces DC power, which can be utilized to drive a DC or an AC motor-pump set using pump controller.

3.2 A SPV Water Pumping system typically consists of:

3.2.1 Motor Pump Set see 3.4.

3.2.2 SPV Pump Controller

Specifications of Controller/Drive for Solar Water Pumping Systems

S.No	Requirement	Specifications
1.	<i>Controller Power Capacity to drive the Pump</i>	Controller Power Capacity should be at-least equal to Solar Panels Power Capacity (Wp), not Pump Capacity. Example: For 5HP pumps, the pump capacity will be 3750W as per MNRE Specs, the solar panel capacity will be at-least 4800Wp the controller capacity should match the solar panel capacity.
2.	<i>Point Tracking (MMPT)</i>	Should track power only and not Voltage at Maximum power point.
3.	<i>Enclosure</i>	The Controller with RMS must have IP65 protection.
4.	<i>Isolator Switch</i>	Should be between Solar panels and the controller.
5.	<i>RMS (GSM/GPRS connectivity)</i>	Controller shall be integrated with Remote Monitoring System with GSM/GPRS and Geo tagging. GSM/ GPRS Charges are to be included in the Costing till the end the of the Warranty period of the Motor-Pump set.

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6.	Controller display/screen	The various parameters should be present on the SPV Pump Controller display/screen such as:- Pump On/Off status, Array Input DC Voltage, DC/AC output Current & voltage, operating frequency, Latest RMS Latitude, Latest RMS Longitude, Pump Capacity (HP), PV Module Capacity (KW), Pump Status, Current Generation (kW), Today Solar Generation (kWh), Cumulative Solar Generation (kWh), Today Runs Hours (Hrs.), Cumulative Pump Run Hours (Hrs.), Cumulative Water Discharged (Litres), Total Water Discharged (Litres), Peak Power (kW) supplied by the controller to Motor-Pump Set.
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3.2.3. Provision for remote monitoring unit for the pumps shall be made in the pump controller using GSM/GPRS Gateway with Geo tagging and through an internal/external arrangement having following basic functions:

- a) Controller shall be assigned with a unique serial number and its live status shall be observed remotely on online portal through login credentials;
- b) Live status shall indicate whether controller is ON/OFF
- c) The parameter that is, the water output, water flow rate(calculated based on parameters),in fault condition; array input voltage/current and power shall be logged at an interval of 10min; and
- d) Controller shall have a back up to store the data locally(at least for 1 year)

3.2.3.1 Remote Monitoring System (RMS)

The detailed Specification of RMS is attached at Annexure I.

3.3 Solar Photo Voltaic (SPV) Array

3.3.1 SPV array contains specified number of same capacity, type and specifications modules connected in series or parallel to obtain the required voltage or current output. The SPV water pumping system should be operated with a SPV array of minimum capacity in the range of **900 Wp to 22500Wp**, measured under Standard Test Conditions (STC). A Sufficient number of modules in series and parallel could be used to obtain the required voltage or current output. The power output of individual SPV modules used in the SPV array, under STC, should be a minimum of **300 Wp**, with adequate provision for tolerances measurement. Use of SPV modules with higher power output is preferred.

3.3.2 Modules supplied with the SPV water pumping systems shall have a certificate as per IS 14286/IEC 61215 specifications or equivalent National or International /Standards. STC performance data supplied with the modules shall not be more than one year old.

3.3.3 Modules must qualify to IS/IEC 61730 Part I and II for safety qualification testing.

3.3.4 The minimum module efficiency should be minimum 19 percent and fill factor shall be more than 75 percent.

3.3.5 Modules must qualify to IS 170210 (Part 1) for the detection of potential-induced degradation - Part 1: Crystalline silicon (Mandatory in case the SPV array Open Circuit voltage is more than 600 V DC)

3.3.6 In case the SPV water pumping systems are intended for use in coastal areas the solar modules must qualify to IEC/ IS 61701 for salt mist corrosion test.

3.3.7 The name plate of SPV module shall conform to IS 14286/IEC 61215.

3.3.8 Module to Module wattage mismatch in the SPV array shall be within ± 3 percent.

3.3.9 Any array capacity above the minimum array wattage requirement as specified in these specifications for various models of SPV Water Pumping Systems is allowed.

3.3.10 The SPV modules must be warranted for output wattage, which should not be less than 90% of the rated wattage at the end of 10 years and 80% of the rated wattage at the end of 25 years.

3.3.11 The RFID tag shall be placed inside the glass laminate of the SPV modules.

3.4 Motor-Pump Set

3.4.1 The SPV water pumping systems may use any of the following types of motor pump sets:

- a) Surface Mono-set.
- b) Submersible motor-pump set.
- c) Any other type of the motor-pump set after approval from Ministry.

3.4.2 Motor

The motors of the motor-pump set may be of the following types: -

- a) AC Induction Motor.
- b) DC Motor, PMSM/ SRM.



3.4.3 The "Motor-Pump Set" should have a capacity in the range of 1 HP (0.75 kW) to 25 HP (18.75kW) and should have the following features:

- a) The closed coupled or mono block DC/ AC centrifugal motor-pump set with appropriate mechanical seal(s) which ensures zero leakage.
- b) The motor of the capacity ranging from 0.75kW to 18.75kW shall be AC/DC. The suction and delivery head will depend on the site-specific condition of the field; and
- c) Submersible pumps could also be used according to the dynamic head of the site at which the pump is to be used.

3.4.4 The pump and all external parts of the motor used in the submersible pump which are in contact with water, should be of stainless steel of grade 304 or higher as per IS 691 and IS 3444. The motor pump set shall have 60 months guarantee and therefore, it is essential that the construction of the motor and pump shall be made using parts which have a much higher durability and do not need replacement or corrode for at least 60 months of operation after installation. Further for submersible pumps used in coastal areas or bores with higher salinity, stainless steel of grade 316 or a higher grade may be used.

3.4.5 The suction/ delivery pipe shall be of HDPE or uPVC column pipes of appropriate size, electric cables, floating assembly, civil work, and other fittings required to install the Motor-Pump set. In the case of HDPE pipes the minimum pressure rating of 8 kg/sqcm-PE100 grade for pump sets up to 3 HP, 10 kg/sqcm-PE100 grade for 5 HP pump set as per IS 10804 and further higher minimum pressure rating for above 5 HP as appropriate shall be used.

3.5 Module Mounting Structures and Tracking System

3.5.1 The SPV modules should be mounted on metallic structures of adequate strength and appropriate design, which can withstand the load of modules and high wind velocities up to 150 km per hour. The raw material used and the process for manufacturing of module mounting structure including welding of joints should conform to applicable IS 822. The module mounting structure should be hot dip galvanized according to IS 4759. Zinc content in working area of the hot dip galvanizing bath should not be less than 99.5% by mass.

3.5.2 To enhance the performance of SPV water pumping systems arrangement for seasonal tilt angle adjustment and three times manual tracking in a day shall be provided. In order to make structure rigid, the gap between Telescopic pattern supports should be minimal, further, for bearing of center load of whole structure only pins should be used instead of threaded bolts.

3.5.3 The general hardware for structure fitment should be either SS 304 or 8.8 grade as per IS 6911. Modules should be locked with antitheft bolts of SS 304 Grade. Foundation should be as per the site condition, based on the properties of soil. Foundation can be done either with the help of 'J Bolt' (refer to IS 5624 for foundation hardware) or direct piling, it should be decided as per the site and relevant IS i.e., IS 6403 /IS 456 /IS 4091 /IS 875 should be referred for foundation design.

3.5.4 Details of Module Mounting Structure (MMS) for pumps of capacity 1HP and above with SPV modules of the capacity around 350Wp are attached at Annexure-II. These are indicative of minimum standards and the vendors may install MMS with higher standards, which shall be certified by the recognized civil/mechanical/structural engineering department of any IIT/NIT or IISC. The format of the certificate is placed at Annexure-III.

3.5.5 In case of use of SPV Modules of capacity higher than that specified above, the size and weight of each SPV module will also increase. In such cases, the appropriate changes shall be made in the MMS design so that the stress on the individual structural members do not exceed the stress in the corresponding members in the MMS designs given in Annexure-II.

3.6 SPV Pump Controller

3.6.1 Maximum Power Point Tracker (MPPT) shall be included to optimally use the power available from the SPV array and maximize the water discharge.

3.6.2 The SPV Controller with RMS must have IP65 protection.

3.6.3 Adequate protections shall be provided in the SPV Controller to protect the solar powered motor-pump set against the following:

- a) Dry running;
- b) Open circuit;
- c) Accidental Output short circuit;
- d) Under voltage;
- e) Reverse polarity; and
- f) Surge protection to arrest high current surge

3.6.4 A DC switch as per IS/IEC 60947-3 or DC circuit breakers as per IS/IEC 60947-2 suitable for switching dc power ON and OFF shall be provided in the SPV Pump Controller.



3.6.5 All cables used shall be as per IS 694 or IS 9968(Part 1). Suitable size of cable shall be used in sufficient length for inter-connection from the SPV array to SPV Controller and from the SPV Controller to solar powered motor-pump set. Selection of the cable shall be as per IS 14536.

3.6.6 The various parameters should be present on the SPV Pump Controller display/screen such as:- Pump On/Off status, Array Input DC Voltage, DC/AC output Current & voltage, operating frequency, Latest RMS Latitude, Latest RMS Longitude, Pump Capacity (HP), PV Module Capacity (KW), Pump Status, Current Generation (kW), Today Solar Generation (kWh), Cumulative Solar Generation (kWh), Today Runs Hours (Hrs.), Cumulative Pump Run Hours (Hrs.), Cumulative Water Discharged (Litres), Total Water Discharged (Litres), Peak Power (kW) supplied by the controller to Motor-Pump Set.

3.7 Protections

The system should be provided with all necessary protections like earthing, Lightning, and Surge Protection etc., as described below:

3.7.1 Earthing and Lightning Protection

- 1) The Earthing shall be done in accordance with the IS 3043 including its amendments and updated versions.
- 2) The Earthing system should be designed in such a way that it should be able to restrict the potential of each conductor according to the level of insulation applied and magnitude of the current conducted through human body should be less than the value that can cause ventricular fibrillation of heart.
- 3) Earth connections shall be done in such a way that they are visible for inspection and all the earth electrodes can easily be tested at any point of time.
- 4) It is recommended to keep the value of resistance of earth electrode less than 5 ohms.
- 5) All the materials, fittings etc. used for doing earthing shall conform to the Indian standard, wherever exists.
- 6) The actual value of soil resistivity should be considered while designing the earthing system at the site and for reference, selection criteria of the site, for any type of soil treatment to improve earth electrode resistance, etc. the IS 3043 shall be referred.
- 7) The electrode material should be selected according to the corrosivity of the soil in which it is used, for the relation between resistivity and corrosivity of the soil and method to safeguard the conductor against excessive corrosion, the IS 3043 shall be referred.
- 8) It is recommended for selection of type and installation of the earth electrode, the provisions of the IS 3043 should be considered. However, the pipe or rod-type earth electrode is preferable.

- 9) In case of the two-earth electrode or more, the separation among them should be twice the length of the electrode driven in the ground. Except in special conditions (for e.g.- where the soil is hard to dig out), a number of electrodes in parallel are to be preferred over a single long electrode.
- 10) The provisions given in the IS 3043 should be considered, while selecting or connecting the earthing/protective/grounding conductor from the components to the earth pit.
- 11) Separate earthing conductor shall be provided for the controller, motor-pump set and SPV array etc., for its connection to the earthing pit and it should be continuous in nature for electrical conductivity. However, even for the earthing of light current equipment (for example, high voltage testing equipment), the cross-sectional area of the earthing lead shall not be less than 6 mm^2 .
- 12) For the maintenance of the earth electrode and measurement of the Earth electrode resistance the provisions of IS 3043 shall be referred.
- 13) Motor shall have suitable provision for earthing to facilitate earthing of the motor as per IS 3043 at the time of installation. In case GI pipes are used for the purpose of earthing the motor, an earthing connection may be made to the discharge pipe clamps. However, in case of HDPE/uPVC column pipes, a separate metallic cable from the motor to the control panel shall be provided for earthing purpose, and if a four-core cable is used, then the fourth core that is not connected to the terminals can be used for earthing.
- 14) Lightning protection shall be provided as per IEC 62305 and IEC 63227 standards including its amendments and updated versions.
- 15) An external lightning Rod, of height sufficient to meet the requirement of Lightning Protection System (LPS) designed to comply with the class III or higher (Class-I / Class-II), based on the site requirement including the area-specific lightning activity, shall be installed.
- 16) Arrangement and positioning of the separate air-termination systems (external lightning rod) can be determined using different methods given in the IEC 62305-3. While determining the position following points are to be considered such as: -
 - a) The structure to be protected is fully located within the protected volume provided by the air-termination system.
 - b) There should be a separation distance between the air-termination system and SPV power supply system to prevent dangerous sparking against parts of the SPV power supply system in case of direct lightning. The separation distances determined in accordance with IEC 62305-3 & IEC 63227 shall preferably be maintained.
 - c) The possibility of the SPV modules being shadowed by air-termination systems shall be taken into account and distance from the SPV modules can be calculated using the IEC 63227.
- 17) A separate earth electrode is required for the dispersion of the lightning current into the ground with suitably low value of the earthing resistance i.e., less than 5 ohm. And the



minimum length (l_1) of vertical earth electrodes for lightning protection level III or higher shall be determined according to the IEC 62305-3.

- 18) The cross-section of the metal sub-structures used for the connection of the lightning arrester to the earth electrode should be no less than 16 mm^2 Cu or 25 mm^2 Al or GI of equivalent current carrying capacity should be used, which will also depend upon the class of the Lightning protection system.
- 19) The earth pits given with the SWPS (i.e., Earth pit(s) for the BoS system (other than LA) and Earth Pit for LA) should be made equipotentially bonded to each other.

3.7.2 Surge Protection Device

- 1) For SPDs IEC 63227 and its updated versions or amendments should be followed.
- 2) At the DC Input side of the controller, it should have protection from an External Surge Protection Device of Type-2 or higher (i.e. Type-1) in accordance with the IEC 61643-31.
- 3) The rated voltage of SPDs on the DC side, depends on the type of protective circuit and the magnitude of the maximum operating voltage of the SPV modules.

3.8 Use of indigenous components

It will be mandatory to use indigenously manufactured SPV modules with indigenous mono/multi-crystalline silicon SPV cells. Further, the motor-pump-set, controller and balance of system should also be manufactured indigenously. The vendor has to declare the list of imported components used in the SPV water pumping system.

4 PERFORMANCE REQUIREMENTS

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

For D.C. Motor Pump Set:

- i) 110 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 static suction lift corrected for atmospheric pressure and water temperature) and with the shut off head being at least 12 meters.
- ii) 55 liters of water per watt peak of PV array, from a Total Dynamic Head of 20 meters (Suction head, if applicable, minimum of 7-meters static suction lift corrected for atmospheric pressure and water temperature) and with the shut off head being at least 25 meters.



- iii) 38 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) 23 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) 15 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) 10.5 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.
- vii) 9.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 120 meters and the shut off head being at least 180 meters.
- viii) 7.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 150 meters and the shut off head being at least 225 meters.
- ix) 5.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 200 meters and the shut off head being at least 300 meter.
- x) 4.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 250 meters and the shut off head being at least 375 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 attached at Annexure IV.

For A.C. Induction Motor Pump Set:

- i) 99 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 static suction lift corrected for atmospheric pressure and water temperature) and with the shut off head being at least 12 meters.
- ii) 49 liters of water per watt peak of PV array, from a Total Dynamic Head of 20 meters (Suction head, if applicable, minimum of 7-meters static suction lift corrected for atmospheric pressure and water temperature) and with the shut off head being at least 25 meters.
- iii) 35 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) 21 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) 14 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) 9 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.
- vii) 8.5 liters of water per watt peak of PV array, from a Total Dynamic Head of 120 meters and the shut off head being at least 180 meters.
- viii) 6.7 liters of water per watt peak of PV array, from a Total Dynamic Head of 150 meters and the shut off head being at least 225 meters.
- ix) 5.0 liters of water per watt peak of PV array, from a Total Dynamic Head of 200 meters and the shut off head being at least 300 meters.
- x) 4.0 liters of water per watt peak of PV array, from a Total Dynamic Head of 250 meters and the shut off head being at least 375 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 attached at Annexure V.

5 TESTS FOR HYDRAULIC AND ELECTRICAL PERFORMANCE OF PUMPSET

5.1 The AC motor-pump set shall be tested independently for hydraulic and electrical performance as per the relevant IS specification including the following test

- a) Constructional requirements/features
- b) General requirements
- c) Design features
- d) Insulation resistance test
- e) High voltage test
- f) Leakage current test

In case of the DC motor-pump set for (a), (b), (c) declaration will be given by the vendor and for (d), (e), (f) the relevant clause of IS 9283:2013 will be followed for testing until BIS notifies the Standard about it. Once the Standard gets released, then it will be effective for DC motor-pump set from its Date of notification.

5.2 Testing of SPV Water Pumping System shall be done as per the procedure specified by the MNRE.



6 GUARANTEE OF PERFORMANCE

6.1 The SPV Water Pumping Systems shall be guaranteed for their performance of the nominal volume rate of flow and the nominal head at the guaranteed duty point as specified in 4.1 under the "Average Daily Solar Radiation" condition of 7.15 kWh/m^2 on the surface of SPV array (i.e., coplanar with the SPV modules. 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.

6.2 Solar Photo Voltaic Water Pumping Systems shall be guaranteed by the manufacturer against the defects in material and workmanship under normal use and service for a period of at least 60 months from the date of commissioning.

6.3 Sufficient spares for trouble free operation during the guarantee period should be made available as and when required.

7 MARKING AND PARAMETERS TO BE DECLARED BY THE MANUFACTURER

7.1 The motor-pump set and Controller used in SPV Water Pumping Systems shall be securely marked with the following parameters declared by the manufacturer:

7.1.1 Motor-Pump set

- a) Manufacturer's name, logo or trade-mark;
- b) Model, size and SI No of pump-set (To be engraved/laser marked on the motor frame);
- c) Motor Rating (kW / HP);
- d) Total head (m), at the guaranteed duty point;
- e) Capacity (LPD) at guaranteed head;
- f) Operating head range (m);
- g) Maximum Current (A);
- j) Voltage Range (V) and;
- k) Type - AC or DC Motor-Pump set;
- l) Solar Photo Voltaic (SPV) Array Rating in Watts peak (W_p);&
- m) Country of origin.

Note: -In addition, a metal name plate containing the above details shall be fixed on the Module Mounting Structure for the information of user.

7.1.2 Controller

- a) Manufacturer's name, logo or trade-mark;
- b) Model Number;



- c) Serial Number;
- d) Voltage Range(V);
- e) Power Range (kW) for Controller;
- f) Current rating (A);&
- g) Country of origin.

8 OPERATION AND MAINTENANCE MANUAL

8.1 An Operation and Maintenance Manual, in English and the local language, should be provided with the solar PV water 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. Helpline number, Name and address of the Service Centre and contact number of authorized representative to be contacted in case of failure or complaint should also be provided. A guarantee card for the modules and the motor pump set should also be provided to the beneficiary.

9 COMPREHENSIVE OPERATION AND MAINTENANCE

- i. The Contractor should provide 5 years comprehensive maintenance of the Solar Photovoltaic Water pumping system, which shall include corrective maintenance as well as routine service visits during CMC period.
- ii. CMC shall be in line with scheme guidelines and its amendment (if any). Apart from the monitoring, regular periodical maintenance of system has to be done. The report has to be maintained in a prescribed format containing Month, Inspection Date, Action taken against the Defects found in the System and along with signatures of both service Engineer and the farmer/ beneficiary. Maintenance report in digital form to be sent to Scheme implementing agency (SIA) and also uploaded on the portal of SIA whenever such portal or mobile app is made available.
- iii. 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.

- iv. Normal and preventive maintenance of the Solar Photovoltaic Water pumping systems such as cleaning of module surface, tightening of all electrical connections, changing of tilt angle of module mounting structure, cleaning & greasing of motor pump sets, changing filters etc. are also the duties of the deputed personnel during maintenance visits.
- v. During the operation and maintenance period of the Solar Photovoltaic Water Pumping Systems, if there is any loss or damage of any component due to miss management or miss handling or due to any other reasons pertaining to the deputed personnel by empaneled vendor, what-so-ever, the supplier shall be responsible for immediate replacement or rectification. The damaged component may be repaired or replaced by a new component.
- vi. The maintenance shall include replacement of any component irrespective of whether the defect was a manufacturing defect or due to wear and tear.



LIST OF REFERRED INDIAN STANDARDS

456:2000	Plain and reinforced concrete - Code of practice (Fourth Revision)
811:1987	Specification for cold formed light gauge structural steel sections (Second Revision)
822:1970	Code of procedure for inspection of welds
IS 875: Part 1: 1987	Code of practice for design loads (Other Than Earthquake) for buildings and structures: Part 1 dead loads - Unit weights of building materials and stored materials (Second Revision)
694:2010	Polyvinyl Chloride Insulated Unsheathed--And Sheathed Cables/cords With Rigid And-Flexible Conductor for Rated Voltages-Up To And Including 450/750 V
1079:2017	Hot rolled carbon steel sheet, plate and strip - Specification (Seventh Revision)
1161:2014	Steel tubes for structural purposes - Specification (Fifth Revision)
1239 (Part 1):2004	Steel tubes, tubulars and other wrought steel fittings - Specification: Part 1 steel tubes (Sixth Revision)
2062:2011	Hot rolled medium and high tensile structural steel - Specification (Seventh Revision)
2629:1985	Recommended practice for hot-dip galvanizing of iron and steel (First Revision)
2633:1986	Method for testing uniformity of coating on zinc coated articles (Second Revision)
3043:2018	Code of Practice for Earthing
3444:1999	Corrosion resistant high alloy steel and nickle base castings for general applications-Specification
4091:1979	Code of practice for design and construction of foundations for transmission line towers and poles (First Revision)
4759:1996	Hot - Dip zinc coatings on structural steel and other allied products - Specification (Third Revision)
5120:1977	Technical requirements for rotodynamic special purpose pumps (First revision)
5624:2021	Foundation bolts - Specification (First Revision)
6403:1981	Code of practice for determination of bearing capacity of shallow foundations
6745:1972	Methods for determination of mass of zinc coating on zinc coated iron and steel articles
6911:2017	Stainless steel plate, sheet and strip-Specification
7215:1974	Tolerances for fabrication of steel structures
8034:2018	Submersible pump sets - Specification (third revision)
9079:2018	Monoset pumps for clear, cold water for agricultural and water supply purposes - Specification (third revision)
9283:2013	Motors for submersible pump sets
9968 (Part 1):1988	Specification for elastomer insulated cables: Part 1 for working voltages up to and including 1100 volts (First Revision)



10804(Part 1):2018	Recommended pumping systems for agricultural purposes: Part 1 Surface pumps
10804(Part 2):2018	Recommended pumping systems for agricultural purposes: Part 2 Submersible pump set
14220:2018	Open well submersible pump sets - Specification (first revision)
14536:2018	Selection, installation, operation and maintenance of submersible pumpset - Code of practice (First Revision)
IS/IEC 61701: 2011	Salt mist corrosion testing of photovoltaic (PV) modules First Revision
IS 17210 (Part 1):	Photovoltaic (PV) Modules — Test Methods for the Detection of Potential-Induced Degradation Part 1 Crystalline Silicon
IS/IEC 60034-1:2004	Rotating Electrical Machines — Part 1 Rating and Performance
IS/IEC 61683:1999	Photovoltaic System-Power Conditioners — Procedure for Measuring Efficiency
IEC 62253:2011	Photovoltaic Pumping Systems – Design qualification and performance measurements
IS 14286: 2010 /IEC 61215 : 2005	Crystalline Silicon Terrestrial Photovoltaic (Photo Voltaic (PV)) modules - Design Qualification and Type Approval (First Revision)
17429:2020	Solar Photovoltaic water pumping systems-Testing procedure
IS/IEC 61730-1: 2016	Photovoltaic (PV) Module Safety Qualification Part 1 Requirements for Construction
IS/IEC 61730-2: 2019	Photovoltaic (PV) Module Safety Qualification Part 2 Requirements for Testing
IEC 60068-2-6:2007	Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12h cycle)
IEC 62305-1/2/3/4	Lightning Protection
IEC 63227	Lightning and Surge Voltage Protection for photovoltaic (PV) power supply systems
IEC 61643-31	Low-voltage surge protective devices
IS/IEC 60947: PART 1: 2007	Low - Voltage switchgear and control gear: Part 1 general rules (First Revision)

Note:- The latest editions of the indicated standards shall be considered.

Specifications for Remote Monitoring System (RMS)

The Remote Monitoring System shall be capable of providing and handling the following:

- a. **Solar System Performance:** DC Voltage, DC current, AC output Current, Power, Drive frequency, Energy, etc.
- b. **Pump Performance:** Running Hours, Water Discharge (Output), etc.
- c. **RMS Performance:** % of Device Connectivity, % of Data Availability, etc.
- d. **Geo Location:** Real time latitude and longitude should be captured with an accuracy of less than 10m horizontal.
This is required to ensure that system is not moved from its original location.
- e. **Events and Notifications:** Faults related to Pump Operation, Solar generation, Controller/Drive faults like overload, dry run, short circuit, etc.
- f. **Consumer Management:** Name, Agriculture details, Service No. Contact Details, etc.
- g. **Asset Management:** Ratings, Serial Number, Make, Model Number of Pump, SPV Module and Controller, Geo Location, IMEI number (of communication module) and ICCID (of SIM).
- h. **Complaint and Ticket Management:** Complaint management system is a part of centralized monitoring software platform.
- i. **Consumer Mobile Application:** Generation, Running Hours, Water Discharge, Complaint logging, etc.

Communication Architecture of the RMS should be as mentioned below:

a. Communication Connectivity:

- i. **Pump Controller Connectivity:** Communication between RMS and Pump Controller should be on UART/RS485 MODBUS RTU protocol to ensure interoperability irrespective of make and manufacturer.
- ii. **Remote Connectivity:** RMS of SWPS should use GSM/GPRS/2G/3G/4G cellular connectivity.
- iii. **Local Connectivity:** Ethernet/Bluetooth/Wi-Fi connectivity to configure parameters, notifications, communication interval, set points etc. or to retrieve locally stored data
- iv. **Sensor Connectivity:** RMS should have provision for at least two Analog and Digital inputs with 0.1% accuracy to address the requirement of local sensors connectivity if required by SIA/Consumer for applications such as irradiation, flow meter for water discharge, moisture sensor for micro-irrigation, etc.

As mentioned in specifications, Analog and digital sensor inputs will be required for integration of flow meter for water discharge, moisture sensor for micro irrigation, level sensor for overhead tank

water storage etc. Only provision for Analog and digital inputs with 0.1% accuracy of Full-Scale Range is required. Sensors will not be in scope of bidder.

- v. RMS should have provision to give various modes of operations which are as follows:
 - i. Remote Mode: - Pump can be made ON/Off using the Mobile App or in case, farmer do not have a smart phone, farmer shall be able to on-off pump through SMS/missed call.
 - ii. Auto Mode: - Pump can ON/Off automatically using the sensor data which are installed in the field by the beneficiary. (Cost of sensors will be worn by the beneficiary)
 - iii. Timer Mode: - Pump controller shall operate pump as per configured schedule using mobile application i.e.,daily start time and running hours of pump.
 - iv. Manual Mode: - Pump can be made to run into manual mode from field.

To save ground water, provision for remote operation is required so that farmer can switch on and off remotely.

b. Communication Modes:

- i. Push Data on Event/Notification: such as pump on, pump off, protection operated, etc.
- ii. Push Data Periodically: important parameters of solar pump (as mentioned above) should be pushed to central server on a configurable interval. **Default interval should be of 15 minutes. However, if required, it should be possible to configure the periodic interval in multiples of 1 minute starting from 1 minute and up to 15 minutes. Further, in case of any abnormalities or events, RMS should push on event immediately.**
- iii. Command on Demand: It should be possible to send commands via GSM or GPRS to RMS either to control pump operations or to update configuration.

c. Communication Protocol: RMS should provide data on MQTT protocol to establish communication with thousands of system.

d. Security:

- i. Communication between RMS and Server should be secured and encrypted using TLS/SSL/X.509 certificate etc.



- ii. As a part of IoT protocol, Authentication and Authorization should be implemented using a token/password mechanism
- e. **Message Format:** RMS should provide data in a JSON message format as per requirement of implementing agency.
- f. **Data Storage:** In case of unavailability of cellular network, RMS should store data locally and on availability of network it should push data to the central Server. Local data storage should be possible for one year in case of unavailability of a cellular network. RMUs should have configuration updates over the Air of multiple parameters such as IP, APN, Data logging Interval, Set Points etc. is essential. Software updating should be possible with 2G and even without the presence of SD card. Software updating process and/or failure to update software shouldn't disrupt pumping operations.

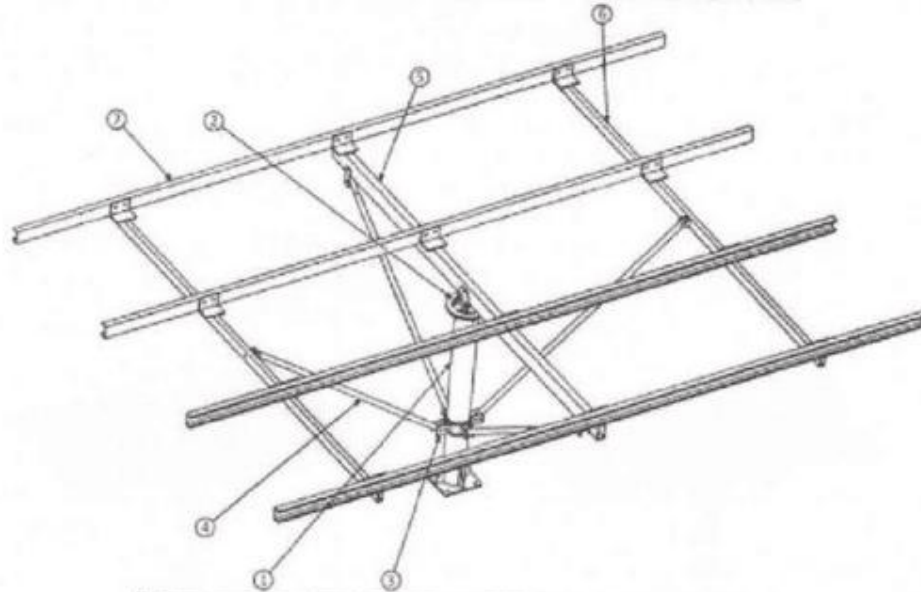
RMS should be connected to the Solar Energy Data Management Platform of the implementing Agency.

- g. RMUs should have configuration updates over the Air of multiple parameters such as IP, APN, Data logging Interval, Set Points etc. is essential. Software to be updated through "Programming over the air" on SIA server. Software updating process and/or failure to update software shouldn't disrupt pumping operations.

Manufacturer should consider Programming Over the Air (POTA) instead of Firmware Over the Air (FOTA) to update configurable parameters such as server IP, URL, Port, APN, Periodic Interval etc.

OP

SPECIFICATIONS FOR DUAL AXIS MANUAL TRACKING TYPE MODULE MOUNTING STRUCTURE (MMS) FOR SPV WATER PUMPING SYSTEM



Main Parts of MMS for Solar Water Pumping System		
Sl No.	Part Name	Qty./Set
1	Main Column	1
2	Top Plate	1
3	Clamp with blade	2
4	Supporting pipe	6/8
5	Main tube	1
6	Side tube	2
7	Mounting purlin	4

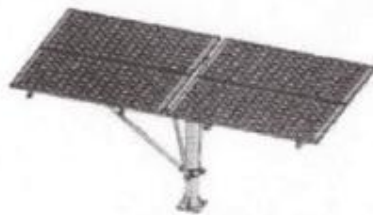
For hot dip galvanizing of fabricated structure following shall be referred:

- Minimum coating required shall be as per IS 4759;
- Preco test (CuSO₄ Dip test) as per IS 2633;
- Mass of zinc (IS 6745 or IS 4759); and
- Adhesion test (IS 2629).

5

B-1 STANDARD MMS FOR 4, 6, 8 AND 10 SOLAR MODULES HAVE BEEN SPECIFIED. THESE STANDARD MMS MAY BE USED IN COMBINATIONS FOR DIFFERENT CAPACITIES OF SOLAR WATER PUMPING SYSTEMS AS FOLLOWS

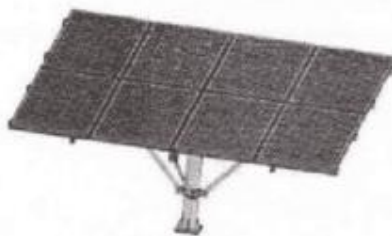
- a) Standard MMS of 4 modules for 1 HP;
- b) Standard MMS of 6 modules for 2 HP;
- c) Standard MMS of 10modules or combination of standard MMS of 4 Modules and standard MMS 6 Modules for 3 HP;
- d) Combination of two standard MMS of 8 modules or combination of standard MMS of 10modules and standard MMS 6 modules for 5 HP; and
- e) Combination of three standard MMS of 8 modules or combination of twostandard MMS of 10 Modules and one standard MMS 6 modulesfor 7.5 HP and so on.



4 MODULE MMS



6 MODULE MMS



8 MODULE MMS



10 MODULE MMS

B-2 SPECIFICATIONS OF MAIN PARTS USED IN MMS ARE GIVEN BELOW

B-2.1 Centre Shaft

Centre shaft used in structure shall be of:

- a) *For 4, 6 and 8 Modules Structure* —Minimum 139 OD with minimum thickness of 4 mm with base plate minimum 10 mm thickness if used and foundation hardware shall be as per IS 5624.
- b) *For 10 Modules Structure* —Minimum 165 OD with minimum thickness of 4 mm

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with base plate minimum 20 mm thickness if used and foundation hardware shall be as per IS 5624.

For system without base plate that is, direct piling is shall be as per the site condition based on the properties of Soil and refer (IS 6403/4091/875/456) for foundation design.

B-2.2 Rafters

The main and secondary rafter used in structure shall be of either SHS or RHS pipe sections.

B-2.3 Purlin

Mounting purlins used in the structure shall be made of cold form steel section as per IS 1079 with minimum thickness of 2mm.

B-2.4 Provision for Seasonal Tilt

In one structure at least four telescopic supports (three may be used in MMS for 4 modules) either round hollow sections or square hollow section to be provided to support the mounting structure.

B-2.5 Provision for Daily Tracking

Provision for daily tracking shall be provided by the way of providing minimum 8 mm thick metal sheet with precision cut grooves.

B-2.6 Module Locking System

Modules shall be locked with anti theft bolts of SS 304 Grade.

B-2.7 General Hardware for Structure Fitment

Either SS 304 or 8.8 grade hardware shall be used for fitment.

B-2.8 Hot Dip Galvanizing

All structure parts shall be hot dip galvanized according to IS 4759.

B-2.9 Tolerance for Fabrication

Tolerance for fabrication of steel structure shall as per IS 7215.

B-2.10 Welding

Welding shall be done as per IS 822 and grade of welding wire shall be (ER70S-6).

B-2.11 Raw Material Test Certificates (MTC)

MTC of all types of raw material used in dual axis manual tracking type MMS as per appropriate Indian Standard shall be submitted along with dispatch documents.



B-2.12 Tests to be performed on dual axis manual tracking type MMS for solar water pumping system.

B-2.12.1 For ascertaining proper welding of structure part following shall be referred:

- a) Weld wire grade shall be of grade (ER 70 S-6); and
- b) D.P. test (pin hole/crack) (IS 822).

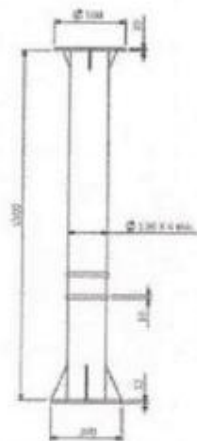
B-2.12.2 For ascertaining hot dip galvanizing of fabricated structure following shall be referred:

- a) Minimum coating required shall be as per IS 4759;
- b) Testing of galvanized material;
- c) Preece test (CuSO₄ dip test) (IS 2633);
- d) Mass of zinc (IS 6745 or IS 4759); and
- e) Adhesion test (IS 2629).

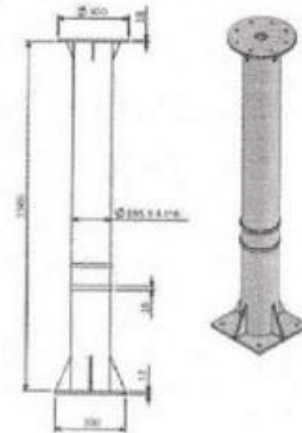


Part 1 Main Column

Columns for 4, 6 and 8 MMS



For 10 MMS

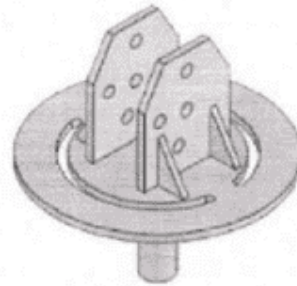
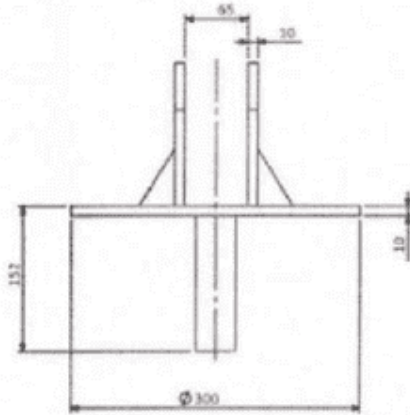


All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail	Length (mm)	Quantity Per Set
I.	MAIN POLE			
	4, 6 and 8 Modules	139 OD	1500	1
	10 Modules	165 OD	1500	1

Part 2 Top Plate

Common for 4, 6, 8 and 10 MMS



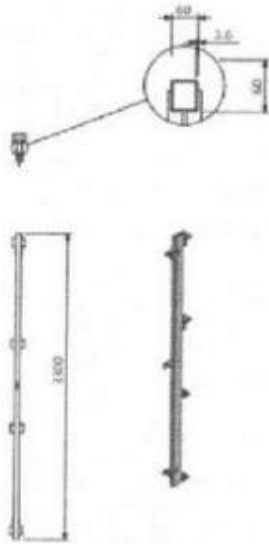
All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail Length (mm)	Quantity Per Set
2.	TOP PLATE (Common for all)	300 OD	1

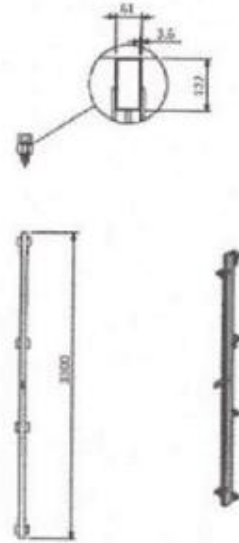
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Part 3 Main Tube

Common for 4 and 6 MMS



Common for 8 and 10 MMS



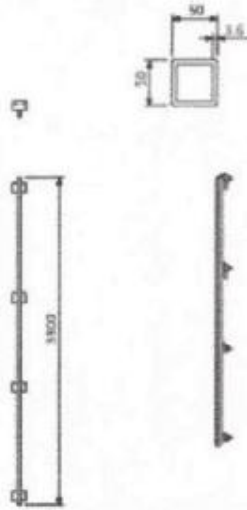
All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail	Length (mm)	Quantity Per Set
5.	MAINTUBE			
	4 and 6 Modules	60 × 60 × 3,6	3300	1
	8 and 10 Modules	112 × 61 × 3,6	3300	1

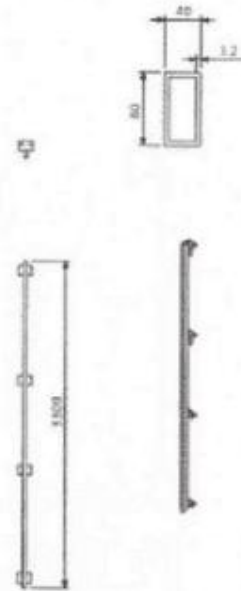
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Part 4 Side Tube

Common for 4 and 6 MMS



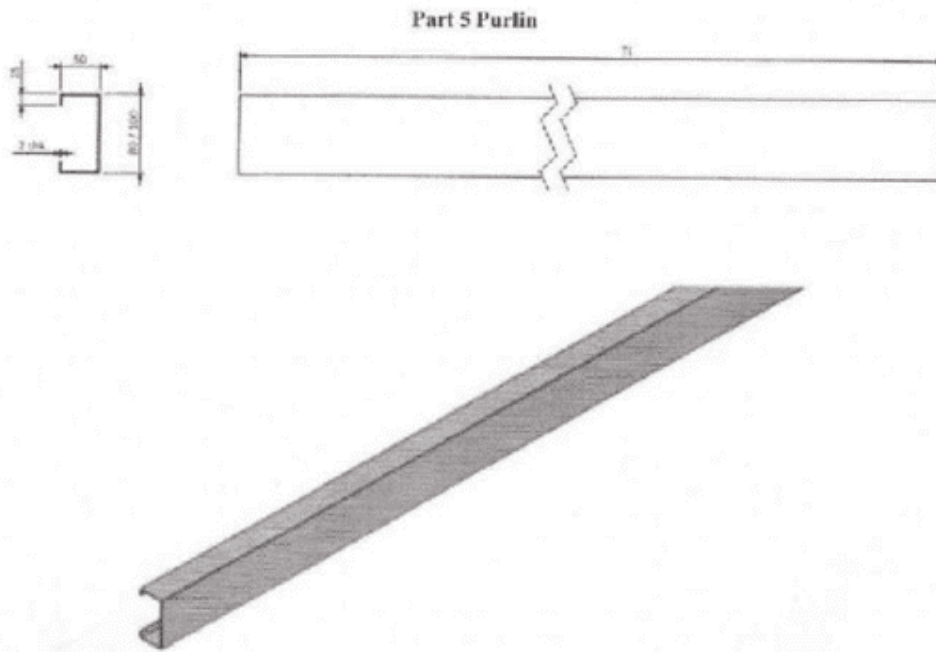
Common for 8 and 10 MMS



All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail	Length (mm)	Quantity Per Set
6.	SIDE TUBE			
	4 and 6 Modules	50 × 50 × 3.6	3300	2
	8 and 10 Modules	80 × 40 × 3.2	3300	2

B



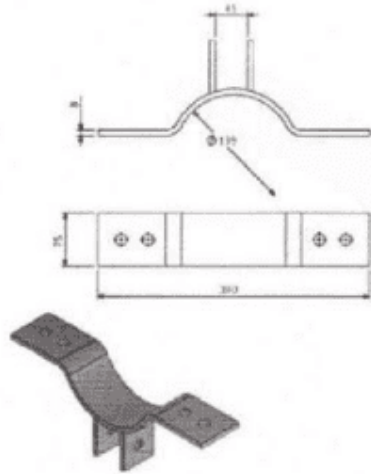
All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail	Length (mm)	Quantity Per Set
7.	MOUNTING PURLIN			
	4 Modules	80 × 50 × 15 × 2	2050	4
	6 Modules	80 × 50 × 15 × 2	3100	4
	8 Modules	80 × 50 × 15 × 2	4150	4
	10 Modules	100 × 50 × 15 × 2	5200	4

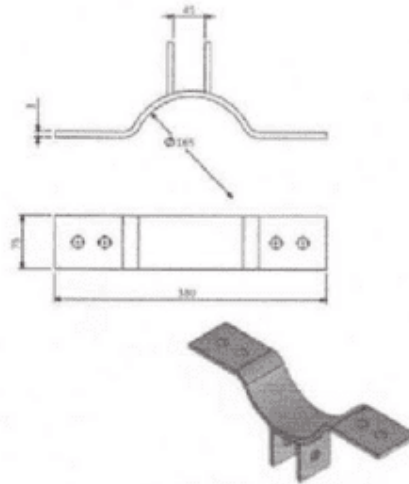
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Part 6 Clamp with Blade

Crosses for 4, 6 and 8 Modules



For 10 Modules

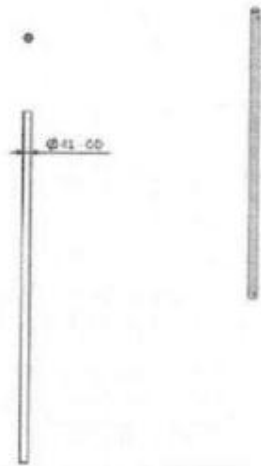


All dimensions are in mm.

Sl No.	Part Name	Cross Section Detail	Length(mm)	Quantity Per Set
3.	CLAMP WITH BLADE			
	4, 6 and 8 Modules (For 139 OD Pole)	75 × 8	380	2
	10 Modules (For 165 OD Pole)	75 × 8	380	2

Part 7 Supporting Pipes

4A) Supporting Pipe - 4 Nos./Set
Common for 4, 5, 8 and 10 MMS



4B) Supporting Pipe - 2 Nos./Set
Common for 4, 6, 8 and 10 MMS



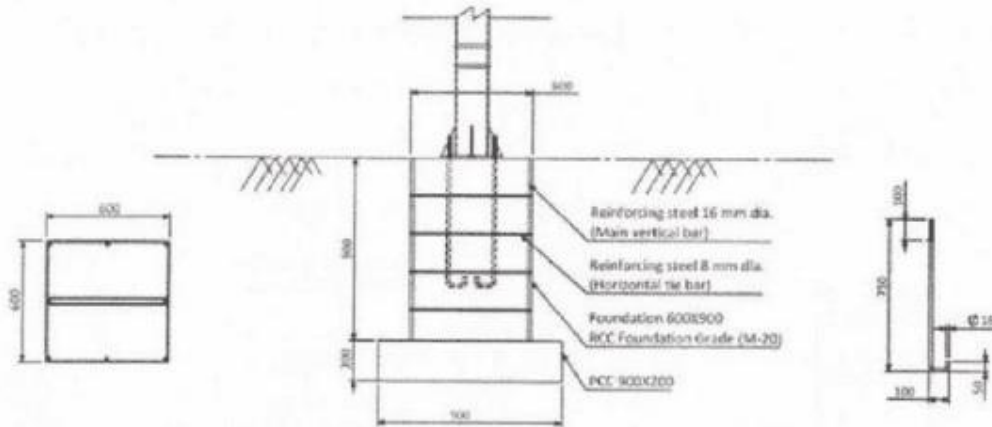
All dimensions are in mm.

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Main-Parts of MMS for SPV Water Pumping System

<i>Sl No.</i>	<i>Part Name</i>	<i>Cross Section Detail</i>	<i>Length (mm)</i>	<i>Quantity Per Set</i>	<i>Material Grade</i>
1.	MAIN COLOUMN				
	4, 6 and 8 Modules	139 OD	1500	1	YST – 240 as per IS 1161/IS 1239 and E250 as per IS 1079/IS 2062
	10 Modules	165 OD	1500	1	
2.	TOP PLATE (Common for all)				
	—	300 OD	—	1	YST – 240 as per IS 1161/IS 1239 and E250 as per IS 1079/IS 2062
3.	MAIN TUBE				
	4 and 6 Modules	60×60×3.6	3300	1	YST – 240 as per IS 1161/IS 1239 and E250 as per IS 1079/IS 2062
	8 and 10 Modules	122×61×3.6	3300	1	
4.	SIDE TUBE				
	4 and 6 Modules	50×50×3.6	3300	2	YST – 240 as per IS 1161/IS 1239 and E250 as per IS 1079/IS 2062
	8 and 10 Modules	80×40×3.2	3300	2	
5.	MOUNTING PURLIN				
	4 Modules	80×50×15×2	2050	4	E250 as per IS 1079/IS 2062 and IS 811
	6 Modules	80×50×15×2	3100	4	
	8 Modules	80×50×15×2	4150	4	
	10 Modules	100×50×15×2	5200	4	
6.	CLAMP WITH BLADE				
	4, 6 and 8 Modules (for 139 OD pole)	75×8	380	2	As per IS 1079 and E250 as per IS 2062
	10 Modules (for 165 OD pole)	75×8	380	2	
7.	SUPPORTING PIPES				
	4, 6 and 8 Modules	41 OD and 33 OD	—	6	YST – 240 as per IS 1161/IS 1239 and E250 as per IS 1079/IS 2062
	10 Modules	41 OD and 33 OD	—	8	

Foundation Design for 4 and 6 MMS



All dimensions are in mm.

BOM For Steel

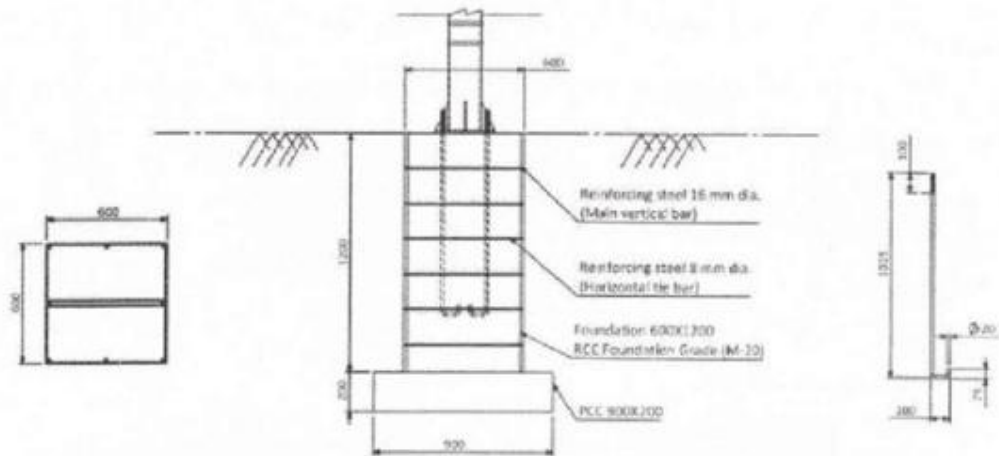
TMT Bar (mm)	Length (mm)	Unit Weight (kg)	Quantity (Pcs.)	Total Weight (kg)
16	1000	1.578	8	12.6
8	2400	0.950	4	3.8
8	1250	0.500	4	2

BOM For RCC and PCC

Block	Width (m)	Length (m)	Height (m)	Volume (m ³)
RCC Column	0.600	0.600	0.900	0.324
PCC	0.900	0.900	0.200	0.162

8

Foundation Design for 8 MMS



All dimensions are in mm.

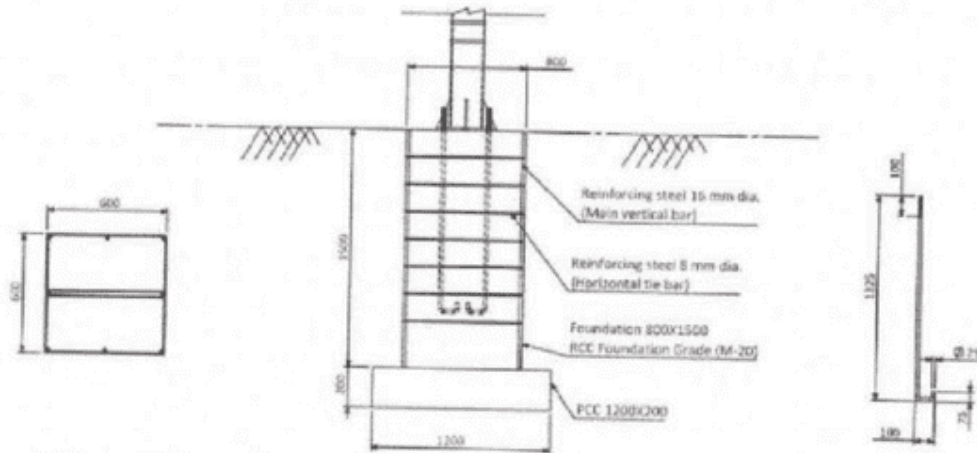
BOM For Steel

TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)
16	1300	2.050	8	16.4
8	2400	0.950	6	5.7
8	1250	0.500	6	3

BOM For RCC and PCC

Block	Width (m)	Length (m)	Height (m)	Volume (m ³)
RCC Column	0.600	0.600	1.200	0.432
PCC	0.900	0.900	0.200	0.162

Foundation Design for 10 MMS



All dimensions are in mm.

BOM For Steel				
TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)	TMT Bar (mm)
16	1800	2,500	8	20,0
8	3200	1,250	7	8,75
8	1650	0,650	7	4,55

BOM For RCC and PCC				
Block	Width (m)	Length (m)	Height (m)	Volume (m ³)
RCC Column	0,800	0,800	1,500	0,960
PCC	1,200	1,200	0,200	0,288

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Annexure-III

Format of Certificate by the Civil/Mechanical/Structural Engineering Department for MMS
(To be submitted on the letterhead of the Department/College)

This is to certify that the MMS structure drawing along with the foundation(copy enclosed) supplied by.....(Vendor Name) is evaluated at our structural Engineering Department facility at.....(College Name) and it is found superior(in terms of the structural integrity/ load bearing capacity/ stress on the individual structural member) to the MMS structure along with foundation specified in the Specification of Solar Water Pumping System notified by the Ministry of New and Renewable Energy (MNRE) vide F.No-41/3/2018-SPV Division dated 06.03.2023.

The following are the changes when compared to the MNRE's MMS suggestive design: -

S.No.	According to the MNRE MMS	According to the vendor MMS

These are the following improvements in the MMS design submitted by the vendor over the MNRE's MMS suggestive design: -

- 1.
- 2.

Note:- The lab may attach drawings/calculations wherever needed

Signature of the head (Structural/ Mechanical/ Civil engineering department)



ANNEXURE – IV

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems with D.C. Motor /PM/SM/SRM

Description	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7	Model-8	Model-9	Model-10	Model-11	Model-12	Model-13
PV array (Wp)	900	1800	2700	2700	4800	4800	4800	6720	6720	6720	9000	9000	9000
Motor Pump-set capacity (HP)	1	2	3	3	5	5	5	7.5	7.5	7.5	10	10	10
Stal. Dynamic Head (meters)	12	12	12	25	12	25	45	12	25	45	12	25	45
Water output, (liters per day)	9000 (from total head of 10 meters)	19600 (from total head of 10 meters)	27000 (from total head of 10 meters)	14850 (from total head of 20 meters)	52800 (from total head of 10 meters)	26000 (from total head of 20 meters)	18240 (from total head of 30 meters)	71250 (from total head of 10 meters)	57120 (from total head of 20 meters)	21650 (from total head of 20 meters)	99000 (from total head of 10 meters)	48500 (from total head of 20 meters)	34200 (from total head of 30 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 SPV modules).

Notes:

1. Suction head, if applicable; minimum of 7 meters static suction lift corrected for atmospheric pressure and water temperature.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – IV (CONTD.)

Indicative Technical Specifications of Shallow Well (Surface) Pumping Systems with D.C. Motor /PMSM/SRM

Description	Model-14	Model-15	Model-16	Model-17	Model-18	Model-19	Model-20	Model-21	Model-22	Model-23	Model-24	Model-25	Model-26
PV array (Wp)	11250	11250	11250	11250	13500	13500	13500	13500	13750	13750	13750	18000	18000
Motor Pump-set capacity (HP)	12.5	12.5	12.5	12.5	15	15	15	15	17.5	17.5	17.5	20	20
Start /Off Dynamic Head (meters)	12	25	45	70	25	45	70	100	45	70	100	45	70
Water output (Liters per day)	(237500 from a total head of 10 meters)	(618750 from a total head of 20 meters)	(1275000 from a total head of 30 meters)	(2587500 from a total head of 30 meters)	(742500 from a total head of 20 meters)	(513000 from a total head of 30 meters)	(310500 from a total head of 30 meters)	(203100 from a total head of 30 meters)	(598500 from a total head of 30 meters)	(362240 from a total head of 30 meters)	(236250 from a total head of 30 meters)	(684000 from a total head of 30 meters)	(1116000 from a total head of 30 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 SPV modules).

Notes:

1. Suction head, if applicable, minimum of 7 meters static suction lift corrected for atmospheric pressure and water temperature.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – IV (CONTD.)

Indicative Technical Specifications of Shallow Well (Surface) Pumping Systems D.C. Motor /PMSM/SRM.

Description	Model- 27	Model- 28	Model- 29	Model- 30	Model- 31	Model- 32	Model- 33	Model- 34
PV array (Wp)	18000	18000	20250	20250	20250	22500	22500	22500
Motor								
Pump-set capacity (RHP)	20	20	22.5	22.5	22.5	25	25	25
Static Head (meters)	100	130	70	100	150	70	100	150
Water output (Liters per day)	270000 (from a total head of 70 meters)	180000 (from a total head of 100 meters)	465750 (from a total head of 50 meters)	307500 (from a total head of 70 meters)	312625 (from a total head of 100 meters)	517500 (from a total head of 50 meters)	337500 (from a total head of 70 meters)	236250 (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 SPV modules).

Notes:

1. Suction head, if applicable, minimum of 7 meters static suction lift corrected for atmospheric pressure and water temperature.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – IV (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems with D.C. Motor /PMSM/SRM.

Description	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7	Model-8	Model-9	Model-10	Model-11	Model-12	Model-13	Model-14
PV array (kW)	1200	1800	3000	3000	3000	4800	4800	6750	6750	9750	6750	9000	9000	9000
Motor Pump-set capacity (HP)	1	2	3	3	3	5	5	7.5	7.5	7.5	7.5	10	10	10
Shaft Or Dynamic Head (meters)	45	45	45	70	100	70	100	150	70	100	150	70	100	150
Water output (Liters per day)	45600 (from total head of 30 meters)	68400 (from total head of 30 meters)	114000 (from total head of 30 meters)	69000 (from total head of 30 meters)	45000 (from total head of 70 meters)	104000 (from total head of 50 meters)	72000 (from total head of 70 meters)	50400 (from total head of 100 meters)	153250 (from total head of 50 meters)	101750 (from total head of 70 meters)	70875 (from total head of 100 meters)	207000 (from total head of 20 meters)	135000 (from total head of 20 meters)	94500 (from total head of 300 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 SPV modules).

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – IV (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems with D.C. Motor /PMSM/SRM.

Description	Model-15	Model-16	Model-17	Model-18	Model-19	Model-20	Model-21	Model-22	Model-23	Model-24	Model-25	Model-26	Model-27	Model-28
PV array (Wp)	11250	11250	11250	11250	11800	13500	13500	13000	15750	15750	15750	15750	18000	18000
Motor Pump-set capacity (HP)	12.5	12.5	12.5	12.5	15	15	15	15	17.5	17.5	17.5	20	20	30
Shot Off Dynamic Head (meters)	100	150	180	225	100	150	180	225	100	150	180	225	150	180
Water output (Liters per day)	168750 (from a total head of 70 meters)	118125 (from a total head of 100 meters)	106475 (from a total head of 120 meters)	84375 (from a total head of 150 meters)	202500 (from a total head of 70 meters)	111750 (from a total head of 100 meters)	132250 (from a total head of 120 meters)	161250 (from a total head of 150 meters)	236250 (from a total head of 70 meters)	165750 (from a total head of 100 meters)	149625 (from a total head of 120 meters)	118125 (from a total head of 150 meters)	155000 (from a total head of 100 meters)	171000 (from a total head of 120 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 SPV modules).

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – IV (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems D.C. Motor /PMSM/SRM.

Description	Model- 29	Model- 30	Model- 31	Model- 32	Model- 33	Model- 34	Model- 35	Model- 36	Model- 37	Model- 38	Model- 39
PV array (Wp)	18000	15000	20250	20250	20250	20250	20250	21500	22500	22500	22500
Motor Pumping capacity (HP)	20	20	22.5	22.5	22.5	22.5	22.5	25	25	25	35
Start Off Dynamic Head (meters)	225	300	150	180	225	300	375	180	225	300	395
Water output (Liters per day)	130000 (from a total head of 150 meters)	99000 (from a total head of 200 meters)	212525 (from a total head of 100 meters)	192375 (from a total head of 120 meters)	151875 (from a total head of 150 meters)	111375 (from a total head of 200 meters)	91125 (from a total head of 250 meters)	213750 (from a total head of 120 meters)	168750 (from a total head of 150 meters)	121750 (from a total head of 200 meters)	101250 (from a total head of 250 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 kW/h/ sq.m. on the surface of PV array (i.e. coplanar with the SPV modules).

- Notes:
1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – V

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems with A.C. Induction Motor Pump Set

Description	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7	Model-8	Model-9	Model-10	Model-11	Model-12	Model-13
PV array (Wp)	900	1800	2700	3700	4800	4800	6000	6750	6750	6750	3000	9000	9000
Motor Pump-set capacity (HP)	1	2	3	3	5	5	5	7.5	7.5	7.5	10	10	10
Static Head (meters)	12	12	12	25	12	25	45	12	25	45	12	25	45
Water output (Litres per day)	89100 (from total head of 10 meters)	178200 (from total head of 10 meters)	267300 (from total head of 10 meters)	333300 (from total head of 30 meters)	475200 (from total head of 10 meters)	215200 (from total head of 20 meters)	168000 (from total head of 30 meters)	603250 (from total head of 10 meters)	330750 (from total head of 20 meters)	236250 (from total head of 30 meters)	89100 (from total head of 10 meters)	441000 (from total head of 20 meters)	315000 (from total head of 30 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 SPV modules).

Notes:

1. Suction head, if applicable, minimum 7 meters static suction lift corrected for atmospheric pressure and water temperature.
2. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4, (i.e. Performance 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.

ANNEXURE -V (CONTD.)

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems with A.C. Induction Motor Pump Set

Description	Model-14	Model-15	Model-16	Model-17	Model-18	Model-19	Model-20	Model-21	Model-22	Model-23	Model-24	Model-25	Model-26
PV array (Wp)	11250	11250	11250	11250	13500	13500	13500	13500	15750	15750	15750	18000	18000
Motor Pump-set capacity (HP)	12.5	12.5	12.5	12.5	15	15	15	15	17.5	17.5	17.5	20	20
Shut Off Dynamic Head (metres)	12	25	45	70	25	45	70	100	45	70	100	45	70
Water output * (Liters per day)	11,13,750 (from a total head of 10 meters)	5,51,250 (from a total head of 20 meters)	3,93,750 (from a total head of 30 meters)	2,36,250 (from a total head of 50 meters)	6,61,200 (from a total head of 20 meters)	4,72,900 (from a total head of 30 meters)	2,83,300 (from a total head of 50 meters)	1,89,000 (from a total head of 70 meters)	5,51,250 (from a total head of 30 meters)	3,30,750 (from a total head of 50 meters)	2,20,800 (from a total head of 70 meters)	6,30,000 (from a total head of 30 meters)	3,78,000 (from a total head of 50 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 SPV 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 4 (i.e. Performance 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.



ANNEXURE - V (CONTD.)

Indicative Technical Specifications of Shallow Well (Surface) Solar Pumping Systems with A.C. Induction Motor Pump Set

Description	Model- 27	Model- 28	Model- 29	Model- 30	Model- 31	Model- 32	Model- 33	Model- 34
PV array (Wp)	18000	18000	20250	20250	20250	22500	22500	22500
Motor Pumpset capacity (HP)	20	20	22.5	22.5	22.5	25	25	25
Static Head (meters)	100	150	70	100	150	70	100	150
Water output (Liters per day)	2,52,000 (from a total head of 70 meters)	1,62,000 (from a total head of 100 meters)	4,25,250 (from a total head of 50 meters)	2,83,500 (from a total head of 70 meters)	1,82,250 (from a total head of 100 meters)	4,72,500 (from a total head of 50 meters)	3,15,000 (from a total head of 70 meters)	2,32,500 (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 SPV 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 4 (i.e. Performance 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.

ANNEXURE – V (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems with A.C. Induction Motor Pump Set

Description	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7	Model-8	Model-9	Model-10	Model-11	Model-12	Model-13	Model-14
PV array (Wp)	1250	1800	3000	3000	4800	4800	4800	4800	6750	6750	6750	9000	9000	9000
Motor Pump-set capacity (HP)	1	2	3	3	5	5	5	5	7.5	7.5	7.5	10	10	10
Start Off Dynamic Head (feet)	4.5	4.5	4.5	70	100	120	130	130	70	130	150	70	100	150
Water output (liters per day)	42000 (from 300 l head of 30 meters)	63000 (from 300 l head of 30 meters)	106000 (from 300 l head of 30 meters)	63000 (from 300 l head of 20 meters)	42000 (from 300 l head of 20 meters)	100800 (from 300 l head of 50 meters)	67200 (from 300 l head of 70 meters)	43200 (from 300 l head of 100 meters)	144750 (from 300 l head of 50 meters)	94500 (from 300 l head of 70 meters)	67500 (from 300 l head of 100 meters)	180000 (from 300 l head of 50 meters)	126000 (from 300 l head of 70 meters)	81000 (from 300 l 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 SPV modules).

- Notes:
1. For higher or lower head / PV capacity, or in between various models, water output could be decided as per the clause 4 (i.e. Performance 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.

ANNEXURE – V (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems with A.C. Induction Motor Pump Set

Description	Model-15	Model-16	Model-17	Model-18	Model-19	Model-20	Model-21	Model-22	Model-23	Model-24	Model-25	Model-26	Model-27	Model-28
PV array (Wp)	11250	11250	11250	11250	13500	13500	13500	13500	15750	15750	15750	15750	18000	18000
Motor Pump-set capacity (liters/Day)	12.5	12.5	12.5	12.5	15	15	15	15	17.5	17.5	17.5	17.5	20	20
Start O/C Dynamic Head (meters)	100	150	180	225	100	150	180	225	100	150	180	225	150	180
Water output (liters per day)	157500 (from a total head of 70 meters)	101250 (from a total head of 100 meters)	95625 (from a total head of 120 meters)	75375 (from a total head of 150 meters)	189000 (from a total head of 70 meters)	121500 (from a total head of 100 meters)	114750 (from a total head of 120 meters)	60450 (from a total head of 150 meters)	220500 (from a total head of 70 meters)	141750 (from a total head of 100 meters)	133375 (from a total head of 120 meters)	105525 (from a total head of 150 meters)	162000 (from a total head of 100 meters)	150000 (from a total head of 150 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 SPV modules).

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance Requirements) specified earlier.
3. 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.

ANNEXURE – V (CONTD.)

Indicative Technical Specifications of Solar Deep well (submersible) Pumping Systems with A.C. Induction Motor Pump Set

Description	Model- 29	Model- 30	Model- 31	Model- 32	Model- 33	Model- 34	Model- 35	Model- 36	Model- 37	Model- 38	Model- 39
PV array (Wp)	18000	18000	20250	20250	20250	20239	20250	22500	22500	22500	22500
Motor Pump-set capacity (liters per day)	20	20	22.5	22.5	22.5	22.5	22.5	25	25	25	25
Static Head (meters)	225	200	150	190	225	200	275	180	225	300	375
Water output (liters per day)	120600 (from total head of 150 meters)	90000 (from total head of 200 meters)	132240 (from total head of 100 meters)	172125 (from total head of 120 meters)	156675 (from total head of 150 meters)	101250 (from total head of 200 meters)	81000 (from total head of 250 meters)	191280 (from total head of 120 meters)	190750 (from total head of 150 meters)	112500 (from total head of 200 meters)	60000 (from total head of 250 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 SPV modules).

Notes:

1. For higher or lower head / PV capacity, or in between various models; water output could be decided as per the clause 4 (i.e. Performance 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.

**Guidelines on
Testing Procedure for Solar Photovoltaic Water Pumping System**

1 SCOPE

These Guidelines lays down basis for the testing set up and testing procedures for Solar Photovoltaic (SPV) water pumping system. The SPV water pumping system covered are centrifugal pumps of all types from 1HP (0.75 kW) to 25 HP (18.75 kW).

2 REFERENCE STANDARDS

The Indian and IEC Standards listed at Annex A contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All Standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A. The latest editions of the indicated standards should be considered.

3 DEFINITIONS OF SYSTEMS AND PARAMETERS

3.1 Systems

3.1.1 Stand-Alone Solar PV Water Pumping System

A Solar PV Water Pumping System in stand-alone operation is neither connected to the grid nor to battery bank and is comprised mainly of the following components and equipment:

SPV modules, cabling, controller, motor pump-set, and hydraulic piping. Combination of all these components shall be unique. Any change in combination will be treated as different model of pumping system.

3.1.2 Motor-Pump Set

The Motor-pump set consists of the pump (centrifugal pump) and the driving motor.

3.1.3 Controller

The controller converts the DC power (DC voltage & Current) of the PV array into a high or low DC voltage power, or converts this DC power into single -phase or multi-phase alternating-current power (voltage or alternating current) suitable for driving the motor of Motor-pump set.

NOTE: - The Controller may also include equipment for MPPT, monitoring, metering and for protection purposes.



3.2 Parameters

Following parameter shall be referred during testing of SPV pumping system:

Table 1 – Parameters		
Parameter	Symbol	Unit
(1)	(2)	(3)
Array voltage (d.c.)	V_a	V
Array current (d.c)	I_a	A
Array open circuit voltage (d.c)	V_{oc}	V
Array short circuit current (d.c)	I_{sc}	A
Array maximum power point voltage(d.c)	V_{mpp}	V
Array maximum power point current (d.c)	I_{mpp}	A
Pressure as measured	p	kg/cm ²
Flow rate	Q	lps /lpm /m ³ /h
Motor voltage d.c or a.c	V_m	V
Motor current d.c or a.c	I_m	A
Motor voltage (multi-phase a.c)	V_{ms}	V
Motor current (multi-phase a.c)	I_{ms}	A
Power factor	$\cos\theta$	-
AC frequency (or d.c switching frequency)	F	Hz
Motor speed	N	Min ⁻¹
Radiation	E_e	W/m ²
Temperature	T	°C

4 TEST SETUP

4.1 Test Set-Up

Illustration(s) of test set-ups are shown in Figure 1 & Figure 2, and a block diagram of required test set-up is shown in Figure 3. All test set-ups shall conform to applicable model test set-ups referred above and the water level in the sump well, locations of the throttle valve, flow meter and pressure gauge/sensor connections as indicated in the test set-up(s) shall conform to Figure 1, Figure 2 and Figure 3 accordingly.

4.2 Precautions for Test Setup:

Before initiating testing of the SPV pump the following precautions must be followed:

- a) In case of a direct coupled pump-set, proper alignment of input pipe, output pipe and the sensors shall be ensured;
- b) Air tightness in suction line shall be ensured and the general layout of the system pipe work shall be designed to avoid airlocks;
- c) The offset pipe of suction line shall either be horizontal or inclined upward towards the pump and shall never be inclined downward towards the pump to avoid air trapping;
- d) For the delivery head, a pressure gauge/sensor shall be connected to the delivery line with tapping as shown in Figures 1 or 2 or 3. The tapping shall be flush with the inside of the pipe and shall have its axis at right angles to the direction of flow. The pipe set up between the pump outlet and the pressure sensor shall be the same diameter as the manufacturer's outlet fitting. Sensor/gauge may be connected to the tapping point through a flexible hose;
- e) Preferably, a Digital Pressure sensor/gauges of suitable range need to be used for the measurement of head. Care shall be taken to eliminate any leaks in the connecting pipes and to avoid the trapping of air in the connecting pipe or hose;
- f) It is assumed that over the normal operating range of the pump, the pressure drop due to frictional losses between the pump outlet and the pressure sensor will be negligible and the kinetic energy component of the water at the pump outlet will be small compared to the increase in potential energy due to the increased pressure across the pump;
- g) For instantaneous performance testing, pressure can be sustained by means of a simple gate valve in which backpressure is sustained by restricting the flow. An automatic control valve(s) may be used to sustain a constant upstream pressure. Pressure may also be sustained by means of a pre-pressurized air chamber operating with a pressure maintaining valve at the outlet. A real water column may also be used;
- h) A good quality digital flow meter with electrical output linearly proportional to flow rate shall be connected at the other end of the delivery pipe. The distance between the auto control valve and flow meter shall be more than $5d$ (d =pipe diameter) meters to ensure the laminar flow of water; and
- i) After flow meter the end of the discharge pipe should be beneath the water surface to prevent splashing. This could cause a mixed water / air bubbles fluid entering the pump inlet and affecting its proper operation. If so then a vertical baffle or a similar arrangement shall be inserted in the tank between the pump intake and the return pipe such that water does not make any splash and avoid any bubbles when spread to the bottom of tank to reach the input pump. In this way any small bubbles will be excluded, as they will remain near the surface. Alternatively, a large pipe can be placed around the pump with its top breaking the surface and an arch cut in its base to allow water entry.

4.3 Priming Arrangement

A non-return valve/ foot valve shall be used in suction line, further it may also require suction pipe need to be filled with water for priming purpose in case of surface pumps.



4.4 PV Module Array Structures:

For testing the SPV pump using the actual solar array, outdoor PV array structures with different module mounting capacities (4,6,8,10, etc.) shall be used. The modules are mounted on the structures with a tracking facility to optimize irradiance, power output and accordingly, the total quantity of water pumped in a day.

4.5 Sun Simulator PV Module Tester:

To estimate the wattage of the SPV modules under STC, a high precision (at least class AAA as per IEC 60904-9) sun simulator module tester is required in the pump testing lab. Alternatively, all SPV modules should have STC testing certificate from an NABL accredited test laboratory and the date of testing shall not be later than a year. In the STC testing, if the module is found degraded, the degraded data should be used.

4.6 Simulator (Electrical) Testing

Ideally, the SPV pump should be tested as per the site conditions where it is designed to operate. The details of outdoor testing are discussed in the next sessions. However, for testing under simulated conditions, a programmable Solar PV (SPV) array simulator capable of simulating a given solar PV array configuration (i.e., the number of modules, the type and the series / parallel combination), site radiation and temperature conditions shall be required for laboratory. Measurement equipment with acceptable accuracy and precision shall be used for the detection and data logging of the parameters listed in Table 2.

Table 2 - Core Parameters to be Measured and Recorded			
Parameter	Symbol	Unit	Measurement Uncertainty
(1)	(2)	(3)	(4)
SPV Array voltage	V_a	V	≤ 1 percent
SPV Array current	I_a	A	≤ 1 percent
Pressure/head as measured	p	Kg/cm ²	≤ 2 percent
Flow rate	Q	lps	≤ 2 percent
Solar irradiance	E_e	W/m ²	≤ 2 percent

4.7 Test Setup

For the performance testing of SPV pumps a sump well with sensors for sensing, monitoring and recording of pump parameters will be required. The details of the resources required are given below:

- Water tank/sump of required dimensions;
- SPV modules, Controller, Motor-pump set, cable as per required depth and Other Accessories (Test Sample);
- Pressure transducer with data logging system;

- d) Flow Meter with data logging system;
- e) Suction pipe(s) (if applicable);
- f) Discharge pipe(s);
- g) Pyranometers and Temperature sensors with data logging system;
- h) Auto control valves;
- i) SPV array Simulator(s) for simulation of module arrays for testing;
- j) SPV array for realistic testing;
- k) Structure for mounting modules for realistic condition testing; and
- l) AAA class Sun simulator for testing of modules performance at STC

Refer to the block diagram in Figure 3.

4.8 Constant Head Requirement

Dynamic head variation during test shall be within limit as specified in column 2 of table 3 and the allowable variation in arithmetic average (from the start of flow point to the end of flow point refer to figure 5) of the dynamic head shall be within value specified in column 4 of table 3. Any data with head variation during the test beyond the limit specified in column 3 of table 3 shall be treated as garbage data and shall not be considered in calculations of daily water output.

Table 3 - Allowable variation in arithmetic average of dynamic head			
Clause 4.8			
Sl. No	Required Dynamic head in (meters)	Allowable variation in dynamic head during test	Allowable variation in arithmetic average of dynamic head
(1)	(2)	(3)	(4)
i.	10	± 15 % = ± 1.5 meter	± 0.5 meter
ii.	20	± 10 % = ± 2 meter	± 0.5 meter
iii.	30	± 10 % = ± 3 meter	± 0.7 meter
iv.	50	± 8 % = ± 4 meter	± 0.8 meter
v.	70	± 7 % = ± 4.9 meter	± 0.8 meter
vi.	100	± 7 % = ± 7 meter	± 1 meter
vii.	120	± 7 % = ± 8.4 meter	± 1 meter
viii.	150	± 7 % = ± 10.5 meter	± 1 meter
ix.	200	± 7 % = ± 14 meter	± 1 meter
x.	250	± 7 % = ± 17.5 meter	± 1 meter



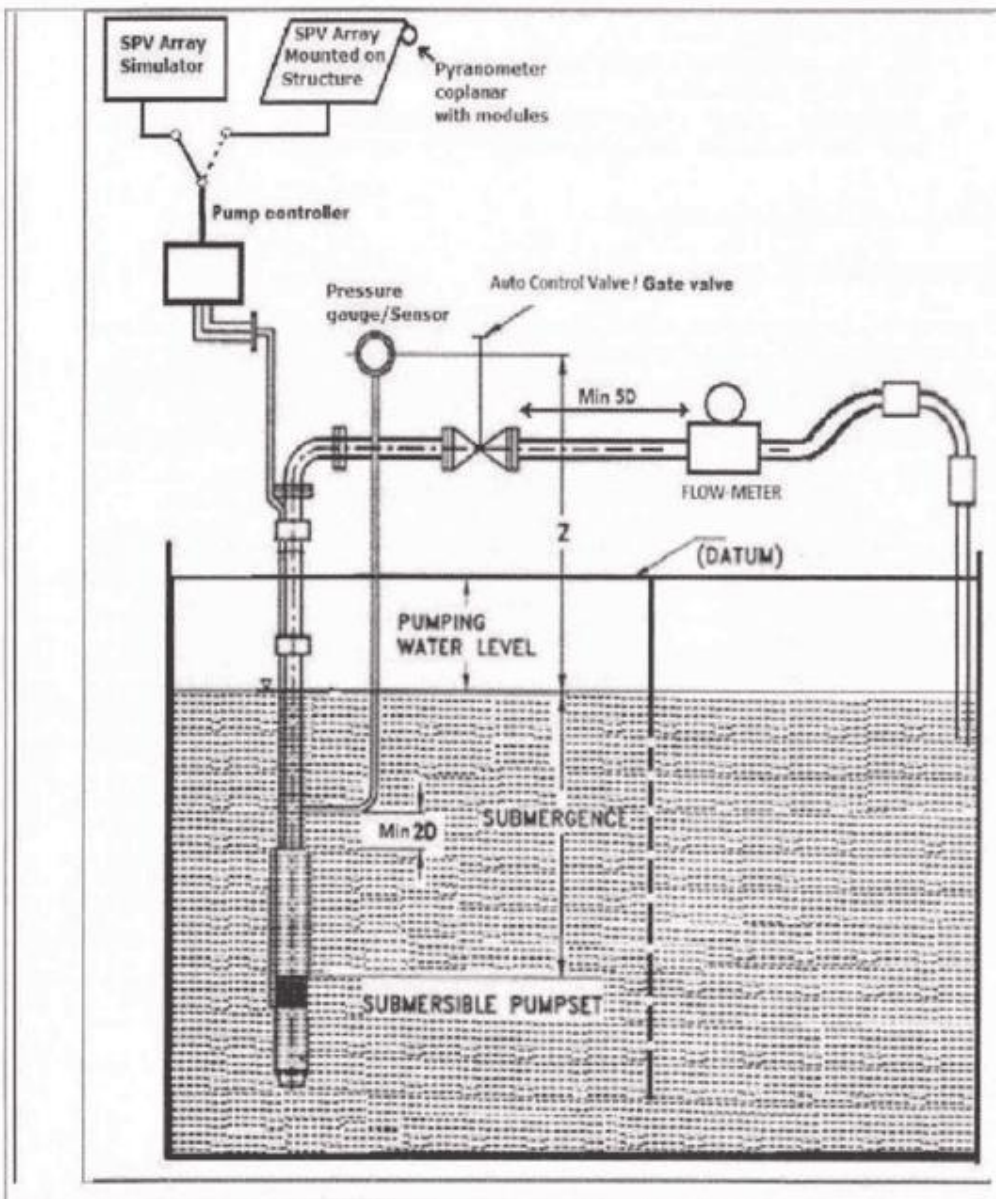


FIGURE 1— TYPICAL TEST SET-UP FOR SUBMERSIBLE SPV WATER PUMP-SET

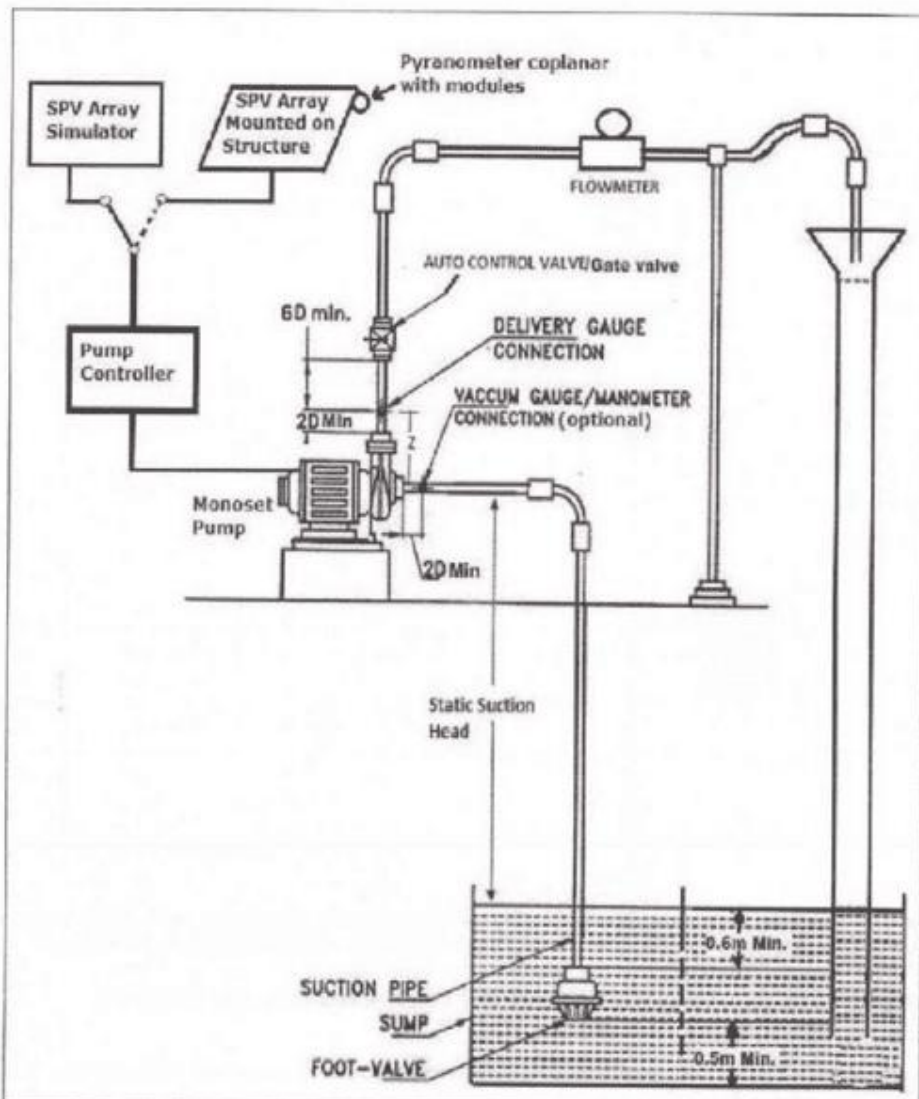


FIGURE 2 – TYPICAL TEST SET-UP FOR SPV SURFACE/MONO-BLOCK WATER PUMP SET

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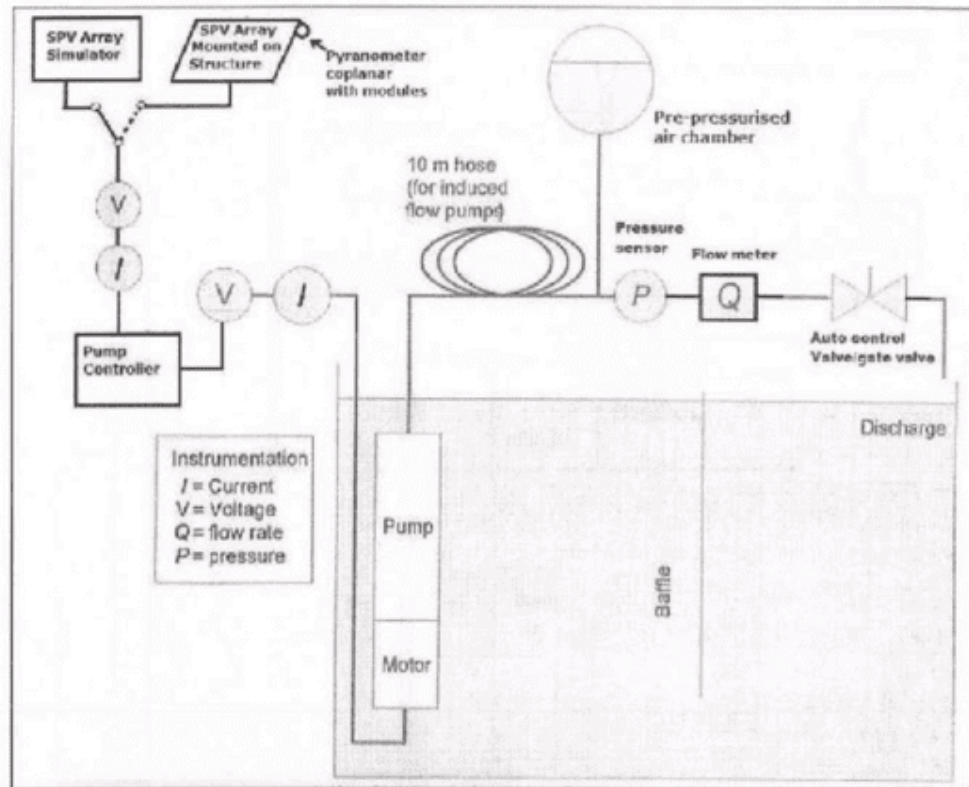


FIGURE 3 – BLOCK DIAGRAM OF TEST SETUP FOR SUBMERSIBLE PUMP-SET

5. TEST PROCEDURE FOR PERFORMANCE EVALUATION OF SPV PUMPING SYSTEM:

There are three major profiles to be completed for comprehensive certification and qualification of a sample SPV water pump as per this standard. Two steps correspond to two simulation profiles, Hot and Cold. The third step corresponds to actual outdoor conditions testing using natural sun radiation. The SPV water pump sample shall attain or exceed the qualification benchmarks set by MNRE for the specified model & design, in all three profiles. Before executing the three profiles testing, it is necessary to conduct the following protections test on the sample:

1. **Dry running:** System shall shut down within one minute/manufacture specification in dry running condition (when the water level goes below pump inlet).
2. **Open circuit:** System shall not operate if any phase become open circuited, the controller shall be tripped within one minute/manufacture specified time.
3. **Short circuit:** System should not operate if any two or all three-phase short circuited.

4. **Reverse polarity:** System shall not malfunction if polarity of input power is reverse.
5. **Under Voltage:** System shall not operate if terminal voltage goes below the limit specified by the manufacturer.
6. **Surge Protection:** A surge protection device (SPD) shall be installed on both the inputs and outputs side.

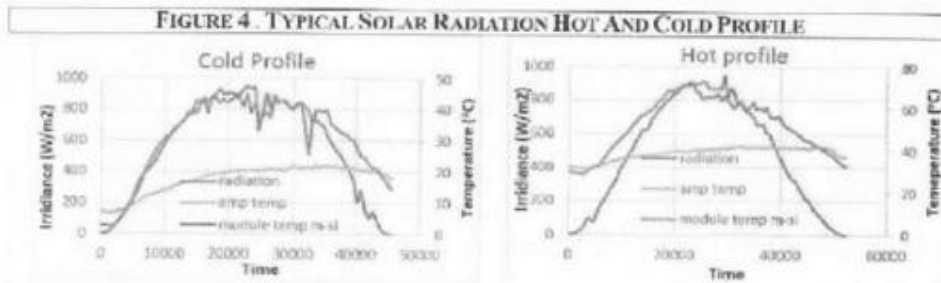
The performance testing of the SPV Pumping System for the three procedures are discussed in the following sections:

5.1 Simulator Methods:

Simulation methods are the easiest and fastest way of estimating SPV pump performance. However, in these methods actual PV array is not used, instead a PV array simulator is used. Here, a Programmable SPV array simulator capable of generating power output equal to actual SPV array under the given radiation and temperature conditions for a given SPV array configuration (i.e., the number of modules, the type and the series / parallel combination) shall be used. Although any radiation & temperature can be created, for the purpose of testing, two conditions one Hot summer day conditions (hot profile) and the other Winter Day conditions (cold profile) shall be used.

5.2 Hot & Cold Profiles:

The typical Hot & Cold day profiles are shown in Figure 4. These profiles of full-day Solar irradiance and temperature shall be loaded in PV array simulator, sequentially one after the other. The simulator output is connected to the motor & pump through the pump controller and the profiles are run-on a real-time basis. The performance parameters as given in table 2 are collected every minute for the entire duration of run time (per day). The total water output and output in liters /watt STC/ day can be estimated at desired constant head / dynamic head for complete duration of profiles. The temperature coefficient of power shall be derived from the IEC 61215/IS 14286 standard test report for the module supplied with the pump of the same model.



Note: Per second data for hot and cold profile may be downloaded from MNRE website using the following link: - <https://mnre.gov.in/solar/standard-specs-cost>

5.3 Outdoor Condition using sun radiation:

To operate the motor-pump set using the actual PV array, an array as per the Motor-pump set HP capacity is to be designed. The STC wattage of all the SPV modules is measured first, as per IEC 60904-1/ IS 12762-1 or clause number 11.6 of IEC 61215/ clause number 10.6 of IS-14286. The modules will then be installed on the structures, both in series and parallel combinations, as required, are connected and a designed PV module array is created. The array output is connected to the Motor & Pump through the pump controller.

Per day water output test has to be performed at desired constant dynamic head for complete day from dawn to dusk (sunrise to sunset). Irradiance shall be measured at coplanar to modules. Tracking may be done manually or automatically. Total flow shall be corrected at reference Average Daily Solar Radiation of 7.15 kWh/m² on the surface of SPV array (i.e., coplanar with the SPV Modules). Results of the SPV pumping system obtained under outdoor conditions shall meet the performance requirement of the system.

NOTES: -

1. Handle SPV modules carefully during installation.
2. SPV modules to be free from dirt (sand, bird droppings etc.,) during the test.
3. Install SPV modules in shadow free access-controlled area
4. Tracking shall be minimum three time in a day for maximum performance
5. Pyranometer shall be mounted co-planer with SPV modules.

Recording, measurement & logging of flow for the period of hot profile, cold Profile and Realistic condition needs to be done.

5.4 Remote Monitoring System Verification

Provision for remote monitoring of the installed pumps shall be made in the controllers through an integral arrangement and it shall be capable of providing live status/parameters through online portal.

6 MEASUREMENTS AND APPARATUS

6.1 Solar Radiation Measurement

Solar radiation at co-planar with the Module surface shall be measured using a pyranometer. Response time of the pyranometer should not be more than 15 seconds. The interval between two readings should not be more than one minute for the calculation of average daily solar radiation.

6.2 Measurement of Head

6.2.1 Delivery Head

Digital pressure gauge/sensor shall be used, also a data logging system shall be used for calculation of average head through day. Interval between the two readings shall not be more than one minute for the calculation of average head. Accuracy for pressure sensor shall be within ± 0.5 percent.

6.2.2 Suction Lift

Suction lift shall be kept constant by mean of vertical distance between sump water level to centre of Pump impeller. Correction in suction lift shall be applied as per atmospheric pressure at the testing place and water temperature.

Distance measuring scale or laser-based sensors may also be used for suction lift measurement.

6.3 Measurement of Rate of Flow

A good quality Magnetic flow-meter of minimum 0.5% accuracy class shall be used for flow measurement, data logging system shall be used for calculating cumulative water volume throughout the day. The maximum flow rate of flowmeters should be at least 1.5 times the maximum flow rate of pumps. Instrument can be selected as per 3.2 of IS 11346. Interval between two readings shall not be more than one minute for the calculation of cumulative flow. Accuracy of flowmeters shall be within ± 0.5 percent.

7 CALIBRATIONS OF APPARATUS

All measuring instruments have to be calibrated periodically as per requirement.

8 STEP-WISE TEST PROCEDURE

8.1 Per Day Water Flow Test of Submersible Pumps

- a) Install the Pump-set as per Figure 1;
- b) Connect Pump-set with controller as per manufacturer instruction;
- c) Use Solar PV Array Simulator Or actual output from SPV array, for testing the pump-set at the given profile;
- d) Connect controller with SPV array Simulator or with actual SPV array output as per requirement of profile;
- e) Input STC performance data of each module in the array, into simulator and invoke the desired profile and run the same;
- f) For a realistic condition test, make an array by mounting all SPV modules on structure(s) by connecting modules in series or parallel as per requirement;
- g) Start the controller after connecting it with the array or array simulator;



- h) Use a head control valve or pre-pressurize tank to keep constant desired dynamic head;
- i) Tabulate the readings in Table 2 and the recording interval shall be less than or equal to 1 minute.

8.2 Per Day Water Flow Test of Surface Pumps

- a) The pump-set should be installed as demonstrated in Figure 2
- b) Maintain height to get desirable static suction lift as per requirement
- c) Install foot valve or non-return valve as per manufacturer instructions; and
- d) Follow steps (b) to (i) of para No. 8.1

9 OBSERVATIONS

The following observations of the complete day profile shall be recorded in a test record sheet. The following observations shall be used to derive pump characteristics:

- a) Instantaneous Solar irradiation (W/m²), pyranometer reading;
- b) Delivery gauge/sensor readings;
- c) Suction gauge/sensor readings / Distance between water level to impeller eye, (if applicable);
- d) Gauge distance correction factor, Z;
- e) Calculate cumulative daily solar radiation on surface co-planar with solar modules (kWh/m²);
- f) Calculate total water discharge in a day at the desirable constant head (Litre per Day);and
- g) Water output per day per watts peak (Litre/Wp).

10 COMPUTATION OF TEST READINGS

10.1 Computation of Total Head for Surface (Mono-set) Pump

$$\text{Total Head } H = \text{HSSL} + H_d + Z + [(V_d^2 - V_s^2) / 2g]$$

HSSL = Total Static suction Lift in meters of water column (measured by calibrated measuring tape or any distance measuring sensors)

H_d = Delivery gauge/sensor reading in meters of water column

Z = Gauge distance correction factor for delivery gauge centre and inlet pipe centre in meters (see figure 3). If the delivery gauge centre is below the inlet pipe centre, Z is subtracted from the delivery gauge reading and if the delivery gauge centre is above inlet pipe centre, Z is added to the delivery gauge reading; the gauge distance correction factor shall never be applied to the suction vacuum gauge or mercury manometer reading irrespective of their positions:

V_d = Velocity at delivery gauge/sensor connection, m/s;

V_s = Velocity at suction gauge/sensor connection, m/s; and

g = Acceleration due to gravity in m/s^2 .

The Total Static Suction Lift in surface pump (H_{ssl})

H_{ssl} = Height in meter from water level to impeller + Altitude correction in meter + water temperature correction in meter.

10.1.1 Correction for Altitude

Barometric pressure shall be recorded at test place. The difference between atmospheric pressure at the test place and 10.33 mWC (that is atmospheric pressure at MSL) shall be deducted from Static suction lift.

10.1.2 Correction for Water temperature

Static suction lift specified in the below Table shall be increased or reduced as given below when the water temperature is below or above 33°C.

Table 4 - Correction for water temperature

Hourly Average of Water Temperature °C	Vapour pressure mWC	Correction in Static suction lift above and below 33°C water temperature mWC
10	0.13	+ 0.39
15	0.18	+ 0.34
20	0.24	+ 0.28
25	0.33	+ 0.19
30	0.43	+ 0.09
33	0.52	0.00
35	0.58	- 0.06
40	0.76	- 0.24
45	1.00	- 0.48
50	1.28	- 0.76

Suction lift shall be adjusted minimum 3 time in a day as per average water temperature and barometric pressure, by adjusting water level of tank.

Following formula can also be used on behalf of table

$$4 y = -0.0007 x^2 + 0.0130 x + 0.3079$$

Where

y = Correction in Static suction lift

x = Average water temperature.

10.2 Computation of Total Head for Submersible Pump-sets



Total head $H = H_d + Z + [(V_d^2) / 2g]$ Where:

- H_d = Delivery gauge/sensor reading in meters of water column;
- Z = Gauge distance correction factor for delivery gauge. Distance between gauge/sensor center to tank water level (refer figure 1).
- V_d = Velocity at delivery gauge/sensor connection in m/s;
- g = Acceleration due to gravity in m/s^2 .

10.3 Total Water Per-Day

Total water output per day shall be calculated by Integration (Sum) of flow rate with respect to time. Integration shall start from the time when pump set achieve desired constant head in morning time (start point refer figure 5) and end at the time when pump set unable to achieve desired constant head in evening time (End point refer figure 5).

In case if Average Daily Solar Radiation found less than requirement then test shall be performed on next sunny day.

10.4 Water Output Per Day Per Watt Peak

Water output per day per watts peak (liter/Wp) = Water output (Liters) per day at specified head / Array STC power in watts-peak

10.5 Cumulative Daily Solar Radiation

Cumulative Solar Radiation (kWh/m²) in a day = Average of instantaneous irradiance reading from Dawn to Dusk (kW/m²) period of time in hours.
This can be obtained through time weight summation of pyranometer readings.

Dawn = Time of sunrise when irradiance become positive from zero value.

Dusk = Time of sunset when irradiance become zero from positive value.

10.6 Mismatch in maximum power at STC among modules of array

The mismatch shall be calculated as under:

$$\% \text{Power mismatch in array} = \frac{(P_{Max} - P_{Min})}{(P_{Max} + P_{Min})} \times 100$$

P_{Max} = Maximum power among modules in array, and

P_{Min} = Minimum power among modules in array

10.7 Efficiency of Array

The efficiency of Array = Power output from array / (total area of modules in m² X Sun radiation in watts/m²)



10.8 Fill Factor of Array

Fill factor of Array – This has to be measured using a PV array tester. This depends on the overall series resistances and shunt resistances of modules in the array.

10.9 Output Voltage of Array

Output Voltage of Array = Sum of voltages of modules in series.
In parallel connected module strings, the lowest voltage generating strings will set the voltage.

10.10 Output Current of Array

Output Current of an Array = Sum of currents of the parallel strings in the array.
The output current of a string is controlled by the lowest current generating module.

10.11 Output Power of Array

Output Power of Array = Sum of power of all modules- mismatch loss.
This can be measured by PV array tester.



11 EXAMPLES:

Total per day flow

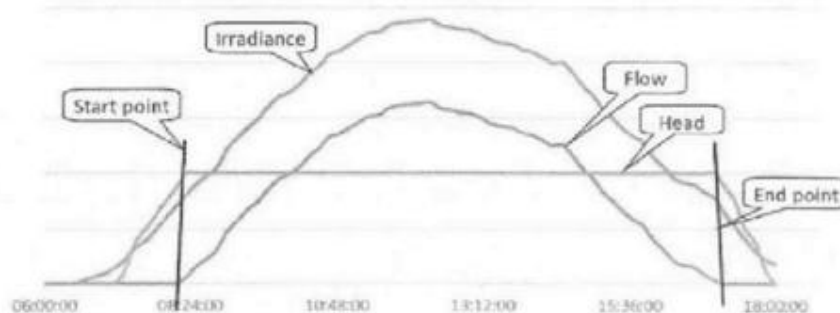


FIGURE 5- TYPICAL GRAPH FOR UNDERSTANDING CALCULATION

If pump achieved constant head at 8:15:30 AM (Start point in figure 5) and in evening Pump unable to keep constant desired head at 17:45:30 PM (End point in figure 5).

Flow rate in lps is recorded from 08:15:30 AM to 17:45:30 PM (start point to end point) If the average calculated is 3.55 lps, then the total flow will be

$$\begin{aligned}\text{Total duration of flow} &= \text{End Time} - \text{Start time} \\ &= 17:45:30 - 8:15:30 \\ &= 9 \text{ h: } 30 \text{ m: } 0 \text{ s}\end{aligned}$$

Total duration from start to end in seconds:

$$= (9 \times 3600) + (30 \times 60) + (0 \times 1) = 34200 \text{ seconds}$$

Total discharge per day in liters = Average flow in lps x Total no of seconds

$$= 3.55 \times 34200 = 121410 \text{ liters}$$

For a realistic test, correct total flow at reference Average Daily Solar Radiation as specified in MNRE specifications.

12 TEST REPORTS

In order to have uniformity, the test reports issued by the Labs shall use a common format developed by NISE. The test report shall be issued only in the name of applicant and shall clearly indicate that whether the Solar PV water pumping system qualify as per MNRE specifications or not along with the details. A soft copy of test report shall also be provided to the applicant and shall be made available on web-portal of test lab, which may be accessed by the implementing agencies for verifying the authenticity of the report.

13 USE OF OTHER BRAND OF SOLAR MODULES

In case a test lab has tested and issued approval certificate for a particular model of SPV pumping system using a particular brand and a particular Wp of SPV Modules, SPV Modules of other brand may also be used for the purpose for the same model of SPV pumping system without going for re-testing of complete SPV pumping system with other brand (or the higher Wp of same brand) of SPV Module, provided the test lab certifies that the SPV Module of other brand(or originally tested brand) is at least of same wattage capacity and its parameters and characteristics are not inferior to the brand of SPV Module with which the model of SPV pumping system was tested and certified by the testing lab. In addition, the total wattage capacity of the Solar Array with the proposed model of SPV Modules shall be equal or higher than the wattage capacity specified by the MNRE for that model of SPV pumping system. The proposed model of SPV module shall also meet the following conditions:

- Solar Array Maximum voltage V_{mpp} with new brand module shall be within $\pm 2\%$ of earlier module.
- Modules Efficiency and Fill Factor shall qualify the minimum requirement of MNRE specifications
- Array and module Mismatch shall meet the MNRE specifications.
- SPV module shall follow the quality control order issued by MNRE from time to time.

14 LABS AUTHORISED FOR SOLAR PUMP TESTING

- Any lab accredited by NABL for testing of solar PV water pumping system as per MNRE specifications and testing procedure, and The National Institute of Solar Energy are authorized to issue approval certificate on successful testing of a solar PV water pumping system.
- Soft copy of test report shall be made available to implementing agencies on request basis.
- Logged data for Head, flow & radiation shall be preserved by laboratory at-least for 1 year.



LIST OF REFERRED STANDARD	
IS No.	Title
17018-1 : 2018	Solar Photovoltaic Water Pumping System Part 1 Centrifugal Pumps — Specification
14286 : 2010	Crystalline Silicon Terrestrial Photovoltaic (PV) Modules — Design Qualification and Type Approval
3043 : 1987	Code of Practice for Earthing
5120 : 1977	Technical requirements for rotodynamic special purpose pumps (first revision)
11346 : 2003	Tests for Agricultural and Water Supply Pumps — Code of Acceptance
6603 : 2001	Stainless Steel Bars and Flats
6911 : 2017	Stainless steel plate, sheet and strip
7538 : 1996	Three-phase squirrel cage induction motors for centrifugal pumps for agricultural applications
8034 : 2018	Submersible pump sets - Specification (second revision)
9079 : 2018	Electric Monoset pumps for clear, cold water for agricultural and water supply purposes - Specification (second revision)
9283 : 2013	Motors for submersible pump sets
11346 : 2002	Code of acceptance tests for agricultural and water supply pumps (first revision)
14220 : 2018	Open well submersible pump sets — Specification
14582 : 1998	Single-phase small AC electric motors for centrifugal pumps for agricultural applications
ISO 9905 : 1994	Technical specifications for centrifugal pumps — Class I
IEC 60068-2-6 : 2007	Environmental testing – Part 2-6 Tests – Test Fc: Vibration (sinusoidal)
IEC 60068-2-30 : 2005	Environmental testing – Part 2-30 Tests – Test Db: Damp heat, cyclic (12 + 12h cycle)
IEC 60146-1-1 : 2009	Semiconductor converters - General requirements and line commutated converters Part 1-1 Specification of basic requirements
IEC 60364-4-41 : 2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock
IEC 60364-7-712 : 2017	Low voltage electrical installations - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems
IEC 60529 : 1989	Degrees of protection provided by enclosures (IP Code)
IEC 60947-1 : 2007	Low-voltage switchgear and control gear - Part 1: General rules
IEC 61000-6-2 : 2016	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
IEC 61000-6-3:2006	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
IS/IEC 61683 :1999	Photovoltaic Systems — Power Conditioners — Procedure for Measuring Efficiency
IS/IEC 61730-	Photovoltaic (Photo Voltaic (PV)) Module Safety Qualification Part 1

1 : 2004	Requirements for Construction
IS/IEC 61730-2 : 2004	Photovoltaic (Photo Voltaic (PV)) Module Safety Qualification Part 2 Requirements for Testing
IEC 61800-3:2017	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods
IEC 62109-1:2010	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC 62305-3:2010	Protection against lightning - Part 3: Physical damage to structures and life hazard
IEC 62458:2010	Sound system equipment – Electro-acoustical transducers - Measurement of large signal parameters
IEC 60904/IS 12762-1	Procedures for the measurement of current-voltage characteristics (<i>I-V</i> curves) of photovoltaic (PV) devices in natural or simulated sunlight.

Note: - The latest editions of the indicated standards should be considered.

Annexure-'C'

**Technical Specification and Testing Procedure for
Universal Solar Pump Controller (USPC)**

1. Preamble:

The Controller for Solar PV pumping system is the heart and brain of the system. The Solar PV pumping system deployed at huge cost to the farmer and the exchequer for the Government is currently utilised only for half of the days in a year (around 150 days per year) on an average. In order to optimally utilize the solar photovoltaic system that generates the electricity throughout the year during sunshine hours, the controller supplied for installation of solar pumping system should be able to perform several other tasks for agricultural and other needs of a farmer. This will increase the productivity of agriculture sector and income of farmer. With the use of USPC the solar system could be used effectively throughout the year.

2. Technical Specification for Stand Alone Application

The USPC with SPV modules and structure can be used for agrarian applications such as water pumping, apple grading and polishing system, wheat (grain) flour grinding machine / ata chakki, cutter/chaff, deep-fridge / cold storage, blower fan for cleaning of grains, heating loads and any other standard voltage (400/415V) three phase motor/equipment of capacity not more than the capacity of Solar PV pumping system. The USPC operation schematic diagram is shown in Fig. 1. Further, the applications are not limited upto the few shown in the figure.

1. Following table gives specifications of electrical supply from USPC for motors other than the solar pumps. For operating the pump the USPC must follow the MNRE specifications for SPV pumping systems.

Sr No.	Description	Desired requirement
1	Motor Supply Phases	Three phase R-Y-B
2	Rated motor frequency	48-50Hz
3	Frequency operation	0 to 52Hz
4	Rated motor voltage	415V \pm 5%
5	Desired motor operation	Constant V by F or constant motor flux control

II. Proposed electrical properties of USPC when operating motors other than motor-pump set:

Sr No.	Description	Desired requirement
1	Characteristic of voltages	Pure sinusoidal or Filtered AC output voltage at motor terminal. No PWM pulses allowed at the motor terminal, as it generates pronounced voltage spikes. The USPC output is intended to use for the traditional induction motors based applications which are design for sinusoidal grid supply.
2	THD of motor terminal voltages	Below 3%
3	THD of motor current (in case of balance/linear motor)	Below 5%
4	Balance supply	Three phases should be balanced and no negative sequence components to be allowed
5	Voltage spikes	Recurring or non-recurring voltage spikes more than 620V (peak of 440V AC supply) is not allowed
6	Alarms and Protections	Output voltage low, Output frequency low/high, Low irradiance/PV power, Current overload, Peak Torque

III. Controller should be able to run SPV pumping system as per MNRE specifications as well as any other type of motor of suitable rating, subject to the load characteristics of the equipment in which the motor is used is any of the following:

- a) Constant torque loads
- b) Constant power loads
- c) Quadratic loads
- d) Impact loads
- e) Hydraulic loads

Subject to the maximum torque being not more than 150% of the rated torque of the motor.

IV. To ensure energy efficiency of solar PV system and to maintain reliability of PV installation against aging effect, module mismatch with time, partial shading, etc., the desired USPC properties and configuration should be as follows:

- (a) Static MPPT efficiency of USPC should be equal or more than 98% during operation of 10 to 100% of rated STC PV power, and average MPPT tracking efficiency in the dynamic condition should be greater than 97 % with hot and cold profiles when feeding the water pumping, hydraulic or heating loads, so as to maintain MPPT irrespective of variation in solar energy or irradiance.

(b) USPC efficiency should be as follows for the operation at 80% rated STC power of the PV array:

Sr No.	SPV pumping system capacity	Controller power efficiency should be more than or equal to
1	3 HP	93.00%
2	5 HP	93.00%
3	7.5 HP	94.00%
4	10 HP	94.50%
5	15 HP	94.50%

(c) Considering voltage variation over the year due to variation in temperature, irradiance and effect due to ageing, environmental damages to PV panels with time, USPC should have MPPT channels as an integral part of system (or externally connected part) with wide range of input PV voltage for MPPT tracking of the PV panels. Input voltage range variation should be tested as per manufacturer declaration (min, nominal or 90% of the maximum) or if no declaration is made than at least it should be tested as per the table given below:-

Sr No.	Motor Pump set capacity	Input voltage range		
		Minimum	Nominal	Maximum
1	3 HP	$(0.85*V_{nominal})$	Nominal	$(1.15*V_{nominal})$
2	5 HP	$(0.85*V_{nominal})$		$(1.15*V_{nominal})$
3	7.5 HP	$(0.85*V_{nominal})$		$(1.15*V_{nominal})$
4	10 HP	$(0.85*V_{nominal})$		$(1.15*V_{nominal})$
5	15 HP	$(0.85*V_{nominal})$		$(1.15*V_{nominal})$

V. There should be Mode selection located on control panel of the USPC along with display and user should be able to select either to run motor-pump set of any other application. The software/firmware required to operate these applications must get automatically loaded when an appropriate position of the switch is engaged.

VI. USPC must have at least four numbers of three phase output cables to feed power to the applications. The output power cable for specific application should get selected automatically upon selection of applications via keypad or via mobile or via remote control connectivity. The manual selector switch should not be used at the output to manage different loads. This is to ensure the hassle-free operation of applications by farmer with adequate safety.



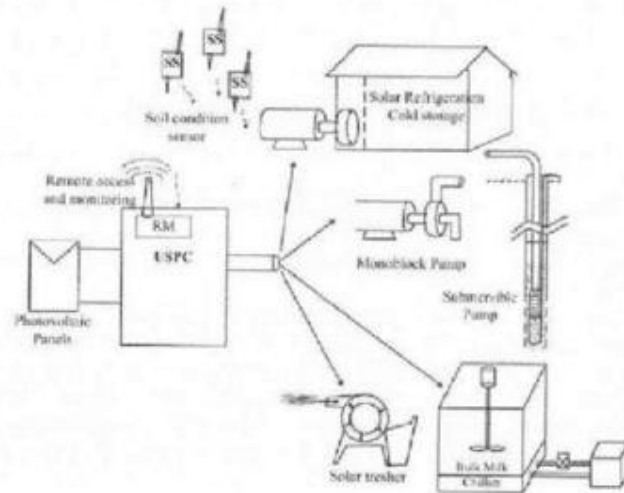


Fig. 1. USPC operation schematic diagram.

VII. USPC based Solar system must be equipped with Remote monitoring and remote fault identification:

- (a) Remote monitoring features should be integral part of solar pump controller and should provide time wise remote monitoring of PV voltage, PV Power, Water output, head, when used in solar pump mode. When operated in farm equipment mode, it should show, PV voltage, PV power, motor voltage, motor current and motor frequency.
- (b) Cumulative energy generation from PV panels for a month, year and 5 years should be provided.
- (c) Remote monitor should show current status of system like On, Off and fault.
- (d) Software associated with remote monitoring should also provide location of SPV pumping system.
- (e) Controller should have support of sufficient Internal memory/ SD card / memory card to support remote monitoring in case of network failure.

USPC must have IP65 protection.

Testing Procedure for Universal Solar Pump Controller (USPC)

USPC must be tested in two principle modes:

1. As an offgrid solar pump controller: the testing should be as per MNRE specifications and Test procedure.
2. As a controller to operate motorized farm equipment: The testing should be as described below.

To test the USPC in the second mode the test centres must have standard actual mode suitable for 4 loading modes. The input to the USPC must be from a solar PV simulator using the hot and cold profiles issued by MNRE. Following tests may be performed on USPC driving the agrarian load like Atta Chakki, Chaff Cutter and Deep Freezer under test. The USPC must be able to operate these motors of the attached agrarian load, so that they deliver the rated torque and are able to also operate till 150% of the rated torque for 30 seconds.

S. No	Test Performed	Expected result	Test Observation	Lab Remarks
1	Application description on screen and selection of applications	LCD screen provided on controller need to shows various applications which can be selected by keypad using up-down and enter key		
2	Mode operation of applications (Automatic: through keypad or remote / Manual: control switches)	Universal Solar Agriculture controller should come with multiple outputs which can be permanently connected to the application by selecting appropriate options for example following applications should automatically started by USPC by appropriate mean such as keypad or remote for selection. (i) Water Pumping (ii) Chaff Cutter (iii) Deep fridge/ Cold Storage (iv) Atta Chakki Manual changeover is not allowed.		

3	Application Specific output (Application specific software)	USPC should have inbuilt individual application specific software to run the agrarian applications other than pumps and output of the controller should be suitable for above mentioned applications			
4	Input PV voltage range Minimum – Voc at STC Nominal – Voc at STC Maximum – Voc at STC				
5	USPC Efficiency measurement in Hot and cold profile should be measured as per BS EN 50530/IEC 62891	Efficiency of the UPSC at minimum..... VOC			
		Load %	Charge controller eff (%)	Power tracking Efficiency (%)	Overall charge controller efficiency (%)
		10			
		25			
		50			
		75			
		100			
		Efficiency of the UPSC at Nominal VOC			
		10			
		25			
		50			
		75			
		100			
		Efficiency of the UPSC at 90 % of Max VOC			
		10			
		25			
		50			
		75			
100					
Dynamic MPPT Efficiency					
Hot Profile					
Cold Profile					
6	Ripple and distortion at output on full load	Should below 5 % after 25 % loading condition			

7	Measurement of Output voltage waveform	Three phase output with up to 440 V rms pure Sine Wave to be measured at least 4 times between 300W/m ² irradiance and maximum irradiance as per the irradiance profile.	CF value should be provided by lab for voltage and current	
8	Operation at different output from array with all four load types (Array wattage as per MNRE model);	Above _____ Watt DC output Should not stop functioning at any load condition. Observation should be recorded.	Power value should be recorded by the lab with all agrarian	Motor current should be recorded (for torque behavior) It must be almost constant
	Example 4800 Wp array) At 40% Power At 50% Power At 75% Power At 100% Power		supported by USPC	irrespective of available DC power from array (motor running condition). This is for Impact loading condition (such as Chaff cutter) current variation need to be
9	Operation at different output from array with all four load types (Array wattage as MNRE model: Example 4800 Wp array) At 10 % Power At 25 % Power At 30 % Power	USPC need to run all the agrarian load in variable frequency at the lower irradiance value The load may be increased beyond 150% of rated torque to determine at what level the motor is stalling and stopping and it must trigger 'torque overload' alert. If it goes beyond 150% of the motor rated torque the USPC must trip indicating an 'overload tripping'.	Motor current should be recorded (for torque behavior) as it is a function of V/F ratio controlled by USPC	
10	Total circuit protection observation	<ul style="list-style-type: none"> • Soft Startup, • low radiation protection, • overload protection, • Open circuit protection • Reverse polarity protection 		

Expected output of individual applications must be specify as per their power rating and SPV capacity, such as:

1. kg/hour grinding of atta chakki, and granularity.
2. Volumetric lceing of cold storage in x hours.
3. Output in terms of kg/hours for a specific capacity grass-cutter.
4. Output must be quantified in terms of rate of volume or weight as above for any other applications.

All the test labs authorised to conduct testing for off-grid solar pumping system as per MNRE specifications may also conduct testing of USPC as per procedure prescribed above and issue testing certificates.



Format 7.22

Technical Bid format/Index for the Technical Bid documents

(Tenders will be technically evaluated based on the sequence/index as per the details given below. In case the firm fails to provide the documents properly as per the Technical Bid format/Index/proper page numbering, bid of the firm can be rejected)

Sr. No.	Name of Document	Status of Submission (Yes/No)	Page Number as per numbering given to the technical bid documents uploaded on the portal
1	Submission of online payments i.e Earnest Money Deposit, Tender Document Fee & e - Service Fee and scanned copies of supporting documents.	Yes/No	
2	All the documents submitted by the bidder as part of its Technical Bid are attested by the signing authority of the bidder.	Yes/No	
3	Submit an undertaking by the bidding firm in reference to acceptance of all the terms & conditions of tender.	Yes/No	
4	Submit a signed copy of tender document/DNIT.	Yes/No	
5	The Bidder is either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership/LLP firm. Submit a copy of certificate of incorporation.	Yes/No	
6	Category of the Bidder(as required in the tender) I. Manufacturer of Solar PV Module or II. Manufacturer of Solar Pump or III. Manufacturer of Solar Pump Controller using indigenous technology or IV. EPC/System Integrator/Aggregator Submit documentary proof.	Yes/No	
7	Is bidder system integrator, Consortium from original manufacturer as required in the tender. Submit documentary proof.	Yes/No	
8	Bidder should have not been forfeited/blacklisted/ debarred either in Govt. Deptt./ Boards/ Corporations/ Federations/ Agencies /any Autonomous Bodies in State of Haryana , other State/ Central Government Departments/Agencies etc. as on the date of submission of the bid in the present tender. Submit an Affidavit on Non Judicial Stamp Paper duly certified by the Notary stating that EMD /Bank Guarantee of the firm [name of the firm] has not been forfeited/ blacklisted/ debarred either in Govt. Deptt./ Boards/ Corporations/	Yes/No	

	Federations/ Agencies /any Autonomous Bodies in State of Haryana , other State/ Central Government Departments/Agencies etc. as on the date of submission of the bid in the present tender.		
9	The Bidder should have alid GST registration Certificate of the billing state. Submit a copy of GTST no. and PAN no.	Yes/No	
10	Bidder should have minimum average annual turnover of Rs. 120 Crore in the last three years, i.e.2020-21, 2021-22 & 2022-2023 as required in the tender. Submit the annual Turnover Certificate in given format duly certified by CA.	Yes/No	
11	The bidders are requested to enclose the proof of the required experience duly certified by SNA/any Government agency.) Submit documentary proof.	Yes/No	
12	Submit Declaration by Bidder in Format 7.14 & 7.15	Yes/No	
13	Submit General Particulars of the bidder in Format 7.16.	Yes/No	
14	The make of major components of the system i.e. Solar module, Pump, Pump Controller, should be mentioned.	Yes/No	
15	Submit Litigation History in Format 7.17	Yes/No	
16	Submit Net worth In the required Performa. Submit documentary proof.	Yes/No	
17	Attached Proof of profitability as required in the tender	Yes/No	
18	The bidder has to submit test reports of quoted capacity/ies shall be issued by the National Institute of Solar Energy and any other labac credited by NABL for testing of solar PV water pumping system as per MNRE specifications and testing procedure. Submit documentary proof.	Yes/No	
19	If manufacturer claims the MSME benefits of Haryana Policy then the test report of solar module or solar cell or solar pumps, as the case may be, in the name of bidder shall be provided/submitted with the bid and along-with proof of manufacturing and testing facility. i.e Purchase bills	Yes/No	
20	Submit all other required forms and declarations.	Yes/No	
21	Submit valid ISO9001:2015 Certificate issued from any NABCB accredited certification body in the field Of quoted item. Submit documentary proof.	Yes/No	
22	Any other document as required in the tender	Yes/No	