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|  | SPECIFICATION | REG-2019-20190716 |
| Rudrapur  | GROUP : REG   | Rev no 00         |

SPECIFICATION FOR SUPPLY OF BoS,  
INSTALLATION & COMMISSIONING  
OF SOLAR PUMP OF (5HP)  
INCLUDING BOREWELL DRILLING

Ac



75

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|---|---------------|-------------------|
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### 1. INTRODUCTION:

This specification defines the scope of the Bidder for the “ **Supply of BoS and Installation & Commissioning of solar pump 5HP AC Submercible including Boring at site**” for irrigation purpose.

2. **LOCATION OF SITE:-** These solar pumps are being installed under “CSR Activity”. Beneficery of this project will be the owner of land where solar pumps to be installed.

The places identified for the installation of Solar pumps are located in vicinity of agriculture land. The project site can accessed by road. Details of site are given below:-

**TABLE : 1**

| S.No.                 | Location   | Area to be covered (Acre) | Available Water Level (Mtr.) | Solar Capacity to be installed (KWp) | Pump Capt. (H.P) | Benificery Name & Contact  |
|-----------------------|--|---------------------------|------------------------------|--------------------------------------|------------------|--|
| <b>A. CHHATISGARH</b> |  |                           |                              |                                      |                  |  |
| 1.                    | Village-Maadpal, TEH - Jagdalpur, Distt.- Bastar, Chhattisgarh                 | 5-8                       | 100 ( Max Head)              | 5.0                                  | 5.0              | Sh. Fule Bhasyam (9406143896)  |
| 2.                    | Village-Kumhali TEH-Jagdalpur, Distt.-Bastar, Chhattisgarh                     | 5-8                       | 150 ( Max Head)              | 5.0                                  | 5.0              | Sh. Arjun Sethiya (9424280276 & 9425575008)  |
| <b>B. ASSAM</b>       |  |                           |                              |                                      |                  |  |
| 1.                    | Village-Hasanpur, Teh-Badarpur, Distt-Karimganj, Assam                         | 5-8                       | 100 ( Max Head)              | 5.0                                  | 5.0              | Sh. Golam Sabbir Choudhury (9954032425) & Sh. Golam Akshary Choudhury (9854589992) |
| 2.                    | Village-Harinagar Part-II, P.O.- Rajartilla, Teh- Katigora Distt- Cachar Assam | 5-8                       | 150 ( Max Head)              | 5.0                                  | 5.0              | Sh. Altaf Hussain Choudhury (7637918039)   |

Location identified for the installation is adjacent to the agricultural land (where irrigation is required). Hence, water supply to be made through 200 Feet. Concrete Channel/ HDPE Pipe for the cultivation of land.


### 3. BIDDER'S SCOPE:

- (a) Supply of BoS, Installation & Commissioning of solar pump along with accessories & other related items (including SPV Module supplied by BHEL). However module shall be provided by BHEL.
- (b) Borewell drilling at site.

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|---|---------------|-------------------|
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- (c) Insurance of Materials upto handover of the site Bidder's scope.  
(d) Frieght, Transit insurance, loading – unloading of material at site.

**Note:**

- (a) Detailed BoQ shall given in Annex-1.  
(b) Items such as Borewell cover, rope wire, cable tie, cable lugs, pipe clamp, MC4 Connector, Signage bord (4' X 2.5'), junction box, cable tie, suction pipe, delivery pipe, fixing clamp, terminal lugs, cable jointing kits and all other items required for installation & commissioning are covered in misc items under s.no.7.  
(c) Supply, Packing & Forwarding, transportation in properly packed condition of all BOS items, materials except SPV module shall be in bidder's scope.  
(d) PV Module of 16 no for each set shall be supplied at site address (as given in table 1) & installation in Bidder's scope. Bidder's are also required to supply all BoS item directly at site.

**4. TECHNICAL SPECIFICATION:-**

**(a) MOTOR PUMP-SET:**

The "Motor Pump Set" should have a capacity of 5 HP as per table 1 and should have the following features:

- The mono block submersible AC centrifugal pump set has its driving unit and impeller mounted on a common shaft, thereby giving it a perfect alignment. The pump should be provided with specially developed mechanical seals which ensure zero leakage.
- The motor of the capacity of 5 HP as per table 1 should be PMDC or BLDC type. The suction and delivery head will depend on the site specific condition of the field.
- The pumps used for solar application should have a **5 years warranty** so it is essential that the construction of the pump be made using parts which have a much higher durability and do not need replacement or corrode for at least 1 years.
- The following details should be marked indelibly on the motor pump set
  - a) Name of the Manufacturer or Distinctive Logo
  - b) Model Number
  - c) Serial Number
  - d) Year of manufacture
- Under the "Average Daily Solar Radiation" condition of 7.15 KWh / sq.m. on the surface of PV array (i.e. coplanar with the PV Modules), the minimum water output from a Solar PV Water Pumping System at different "Total Dynamic Heads" should be as per MNRE Indicative performance specifications **2015-16 or latest** for the AC submersible SPV Pumping Systems.


**(b) CONTROLLER & PROTECTIONS:-**

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

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|---|---------------|-------------------|----|
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**(c) ON/OFF SWITCH:-**

A good reliable switch of reputed make is to be provided with the motor pump set. Sufficient length of cable should be provided for inter-connection between the PV array and the motor pump set.

**(d) MODULE MOUNTING STRUCTURE:-**

- Structure shall be as per IS 808: 1989.
- The support structure used in the pumping system should be hot dip galvanized iron with minimum 80 micron thickness. Based on soil conditions, care should be taken in laying the foundation for the system.
- The PV modules should be mounted on metallic structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour.
- Each panel frame structure shall have provision to adjust its angle of inclination to the horizontal between 10 to 40 degrees, so that the inclination can be adjusted at the specified tilt angle whenever required.
- Each panel frame shall be complete with a weather-proof junction box as per the relevant BIS specifications, where the module terminals shall be interconnected and output taken.

**(e) CABLES & WIRES:-**

Multi-stranded, UV protected, PVC insulated, PVC sheathed cable of appropriate size suitable for solar application so as to minimize the voltage drops & the power loss should be used. The cables should confirm to following IS.

- |    |           |                 |
|----|-----------|-----------------|
| 1. | DC cables | : EN- 50618     |
|    |           | : IEC-60228     |
| 2. | AC Cables | : IS: 7098-1988 |

**(f) PIPES:**

HDPE pipe of suitable length as per table 1. HDPE pipes of medium pressure should be provided.

**(g) BORING:**

Boring of following depths is require at sites:

- 100 meters (Approx.)
- 150 meters (Approx.)

**5. DEVIATION:-**


If any from the technical specification as above shall be brought out clearly in the technical offer of the bidder.

**6. DRAWINGS & MANUALS:**

The technical particulars (such data sheet, type test etc.), installation procedures and drawings of the bought out items like Pumps with controller shall be submitted for approval to BHEL before the procurement. The drawing of mounting structure & Fencing arrangement shall be submitted to BHEL for the prior approval.

**7. PROCUREMENT: -**



|   |               |                   |    |
|---|---------------|-------------------|----|
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| Rudrapur  | GROUP : REG   | Rev no            | 00 |

Sub-Contractors has to procure materials as per listed make. Whenever equivalent make has to be procured for any reason, prior approval has to be taken from BHEL submitting the make and technical particulars of the component.

**8. INSPECTION: -**

The work shall be carried out in the direction of BHEL/Customer Engineers. Therefore, to ensure the quality of work, time to time inspection of work to be done by BHEL/Customer's representative.

**9. DRILLING LOG.**

Bidder to furnish filled drilling logs as per industries norms.

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71


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|----------|---------------|-------------------|
|          | SPECIFICATION | REG-2019-20190716 |
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**DETAILED BOQ FOR WORK OF SUPPLY, INSTALLATION & COMMISSIONING OF  
SOLAR PUMP (Annex-I)**

| SL. No   | Materials Details  | Unit | Qty  | Unit Rate | Total Ex-works Prices |
|--|--|------|------|-----------|-----------------------|
| <b>Part (A) - Supply</b>                         |  |      |      |           |                       |
| <b>(I) SOLAR PUMPS</b>                           |  |      |      |           |                       |
| 1  | 5 HP AC Pumps with VFD with Junction Box.(Total Head: 50 mtr)  | Nos. | 2    |           |                       |
| 2  | 5 HP AC Pumps with VFD with Junction Box.(Total Head: 100 mtr)   | Nos. | 2    |           |                       |
| <b>(II) BoS Items</b>                            |  |      |      |           |                       |
| 1  | G.I. Structural steel for PV Module for 16 Modules   | Kg   | 2200 |           |                       |
| 2  | DC cable (1C x 4 Sqmm)   | Mtr. | 360  |           |                       |
| 3  | AC Cable   | Mtr. | 360  |           |                       |
| 4  | Conduit Pipe for wiring 20 NB  | Mtr. | 100  |           |                       |
| 5  | HDPE Pipe 150 NB (medium Pressure)   | Mtr. | 500  |           |                       |
| 6  | Misc Items such as, Borewell cover, rope wire, cable tie, cables lugs, pipe clamp, MC 4 Connector, & other items required for installation work.   | Set  | 4    |           |                       |
| <b>Part (B) Installation &amp; Commissioning</b> |  |      |      |           |                       |
| 1  | Installation & Commissioning of solar pumps including PV Module & all other accessories and items. (SPV Module shall be provided by BHEL)  | Set  | 4    |           |                       |
| <b>Part (C) Other Items</b>                      |  |      |      |           |                       |
| 1  | Concrete Channel for water Flow (200ft)  | Ft.  | 800  |           |                       |
| 2  | Fencing having size of 30 ft. x 50 ft. with a height of 1.5 mtr. (PCC foundation for the coloum should be provided. Coloums should be of M.S. Angle of 50x50x5 mm & to be installed at a span of 2.5 mtr with the height of 1.5 mtr from ground level. Barwade wire to be installed through the total height of coloums with a spacing of 1.5 feet.) | Set  | 4    |           |                       |
| 3  | Borewell Upto 100 Mtr.   | Set  | 2    |           |                       |
| 4  | Borewell upto 150 Mtr.   | Set  | 2    |           |                       |

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|---------------------------|--|
| (A) Total Ex-Works Amount |  |
| (B) IGST @8.9%            |  |
| Total Value (A+B)         |  |

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8