

INDENT FOR ARRANGING RATE CONTRACT FOR SUPPLY, INSTALLATION AND COMMISSIONING OF SOLAR HIGH MAST LIGHTING SYSTEMS

New and Renewable Energy Department indents to arrange rate contract for supply, installation & commissioning of 3000 Solar High Mast Lighting Systems.

A. Brief Description of Rate Contract items:

Item Sr. No.	Description of Stores	Quantity (Nos.)	Place of Delivery
1.	Supply, installation and commissioning of Solar High Mast Lighting System with seven years warranty of complete system required by New & Renewable Energy Department, Haryana.	3000 nos.	Anywhere in Haryana

The detailed technical specifications of the above stores are at **Annexure-I**.

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

1. The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto or proprietary/partnership/LLP firm. A copy of certificate of incorporation shall be furnished along with the bid in support of above.
2. The bidder should be a manufacturer of solar modules/solar cells/Lithium battery or System Integrator. The System Integrator has to submit the undertaking issued by each manufacturer of major parts/devices (solar modules, battery and luminaire) to be used in system with whom they have tie up mentioning that in case System Integrator defaults, at any stage of execution of warrantee/guarantee/CMC and after sale service of the said device, installed in reference to rate contract of the said tender, then the Company will be responsible to execute the warrantee/guarantee/CMC of the said device at site of installation as per the terms and conditions of rate contract/DNIT of the above tender and will adhere the directions of the New & Renewable Energy Department/HAREDA directly.
3. The bidder has to submit Test report of one unit (110-watt module, 22 Watt LED Luminaire, and 12.8 Volt 50 Ah LiFePO4 battery) of Solar High Mast Lighting System in its name issued by any of the MNRE / BIS /IEC/ NABL accredited laboratory on or after 01.04.2023. Bid without valid test report from MNRE / BIS /IEC/ NABL accredited laboratory will be rejected out rightly. The test report should contain the make and model of major components i.e. module, battery and Luminaire along with their photograph.
4. Domestically manufactured PV Module with domestically manufactured solar PV cells should be used. The PV modules should be made up of crystalline silicon solar cells and must have BIS certificate for IS 14286 & IS 61730 (Part-I, Part II). PV modules must meet the latest specifications of MNRE and the models and Manufacturers of PV Modules shall be included in the List of Models and Manufacturers for Solar PV Modules empanelled by MNRE as per its ALMM order (and shall also be valid at the time of supply of material) from time to time. To bring contractual clarity, Bidders has to give explicit declaration that they are aware of binding provisions of the ALMM Order and the List(s) there under, while quoting the rates in the bid.
5. All other major components should also be indigenously made i.e. Lithium battery and Luminaire.

6. 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.
7. Bidder should have not been debarred/blacklisted by any Govt. Deptt's / organization/ PSU's / institutions/ agencies/ autonomous Organizations.
8. The Bidder should have valid GST registration certificate of the billing state. A copy of which should be enclosed.
9. The Successful Bidder shall be required to establish at least one Service Centre in Haryana. The successful bidder should maintain the inventory of required spare parts at the service centre(s).
10. Past performance of the firms shall be considered while evaluating the technical bids. If the bidder has poor record for providing after sales services to the Haryana during last five years than their bid may be rejected out rightly.
11. Bidder should have minimum average annual turnover of Rs. 900.00 Lakhs in the last three years, ending 31st March of the previous Financial Year i.e. up to 2025-2026.
12. Bidder should have successfully completed similar contracts of cumulative cost not less than Rs. 1200.00 Lakhs to any State / Centre Govt. Agency / Department/ Organization/ autonomous body duly verified by SNA/any govt. agency from 01.04.2023 to the closing date of the bid.
The bidders are requested to enclose the proof of completion of the required value systems duly certified by SNA/any Government agency.
Similar contract means: Supply, Installation & Commissioning of Solar Street Lighting / Solar High Mast Lighting / Solar Home Lighting systems.
(Document to be uploaded: Only Commissioning Certificates certified by SNA or any Government agency supporting the claim. Bidders shall not upload the work orders)
13. The bidder should have positive net worth in the previous last three Financial Year (2023-2024 to 2025-2026) (Document to be uploaded)
14. Bidder is required to submit a sample of one unit of the quoted product (110 Watt Solar PV Module, 22 Watt LED Luminaire, 12.8 Volt 50Ah LiFePO4 batteries) along with tender. Non-compliance shall in rejection of the bid.
15. Technical Catalogue of the product is required to be submitted along with the bid & same should be available on bidder's website.
16. Rate Contract will be made / valid for TWO YEARS from the date of issue.
17. The rates quoted should be inclusive of GST (@8.9%) and all other charges etc. (as applicable).
18. **Delivery period (includes supply, installation & commissioning):** -Three months from the date of placement of work order.
19. **Warranty:** - Seven years from the date of commissioning (including batteries) and PV module(s) will be warranted for a minimum period of 25 years from the date of supply. PV modules used in Solar Lighting system must be warranted for their output peak watt capacity, which should not be less than 90% at the end of Ten (10) years and 80% at the end of Twenty-five (25) years.
20. **Payment:** -
 - i. 60% payment will be released within one-month time on submission of material receipt of physical delivery of inspected/ accepted goods in physically good condition at consignee go down on submission of bill of material supported by material receipt duly signed by PO/APO of the department/ office.

- ii. 30% will be released within one-month time after satisfactory installation / working of the items on submission of joint commissioning report (JCR) along with photograph of the system in the attached format duly signed by the user & PO/APO of the consignee department/ office with countersignature of head of the office (ADC-cum-CPO).
 - iii. 10% payment will be released on completion of 07 years from the date of commissioning of the systems on submission of satisfactory performance report of the systems duly certified by the concerned PO/APO OR said amount may be released against submission of bank guarantee of equal amount valid for seven years from the date of commissioning of the system.
21. Material shall be strictly as per DNIT specifications/requirement. If there is any left out specification, the same shall be considered as per the latest specification/requirements applicable as per BIS/International Standards. The bidders are advised to be well conversant with these specifications/requirements for their compliance.
 22. The make and model of major components of the system i.e. Solar module, Solar Charger, Battery and Luminaires should be strictly as per the make and model mentioned in the test report and sample submitted with the bid. Accordingly, the same should be mentioned in the technical bid.
 23. In case of any complaint in the working of the items during the warranty period, the firm shall attend the same within 24 hours from the time of logging of first complaint / call by the consignee and the items must be repaired within three days thereafter. The complaints would be logged by the Department officers by e-mail/ fax in order to keep the proper delivery records. Further in case of failure to do so, penalty @ 0.1 % of the system cost per day (subject to max. 10% of the cost) after expiry of 72 hours shall be imposed. If the firm does not attend the complaint within the max penalty period, then the system may be got repaired/ replaced from the performance security amount. In case whole performance security amount is utilized and complaint/s are still pending then an online / registered notice will be sent to the firm to attend the complaint and if failed to attend the complaint within 7 days then firm may be blacklisted and a legal proceeding may be initiated against the firm for breach the agreement.
 24. The applicable GST is 8.9 % 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 5% 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 8.9 %. Further, if any change /amendment in thereof, same will be applicable.
 25. 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 7years warranty (or as notifies 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 levies 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.
 26. 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.

27. 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 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.

28. Bidder who is manufacturer of Solar PV Modules or Solar Cells or Lithium battery 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 shall be treated as manufacturer for getting the benefits of concession under MME/MSME policy. The test report shall be issued by the date of closing 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, it its unit.
29. If any bidder provides false information or conceals the facts regarding debarred/black-listed, experience, turnover or other conditions mentioned in this tender, Nodal agency reserves the right to forfeit both EMD & Performance Bank Guarantee of the bidder, to black list the bidders, to cancel the contract and other punitive action.

Annexure-I

TECHNICAL SPECIFICATIONS

A Solar PV White- LED High Mast Light consists of white LED luminary of maximum 4 X22 Watt (LED + Driver) as per configuration along with solar PV modules and battery of given capacity, necessary control electronics-inter connecting wires / cables, module mounting structures etc. to operate the load for dusk to dawn or as per provision in the charge controller. The broad performance specifications of a White Light Emitting Diode (W-LED) light source based solar street lighting system are given below: -

BROAD PERFORMANCE PARAMETERS

PV Module	Only indigenous modules shall be used in the Project. SPV module aggregate capacity 440 Wp (110 Wp X 4 Nos.) at under STC. Module Voc minimum of 21V
Battery (LiFePO4)	Lithium Ferro Phosphate battery aggregative capacity 12.8 Volt 200 Ah (50Ah x 4 nos) 12.8 Volt 50 Ah of one unit.
Light Source	White Light Emitting Diode (W-LED) 4x22 Watt (LED +Driver)

	Using LEDs which emits ultraviolet light will not be Permitted
Light Out put	<p>White colour (colour temperature 5500-6500 K). Lumen efficacy of LED- min 150 lumens/Watt @350 mA. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye.</p> <p>The lumens output of each luminaire should not be less than 3000 lumens.</p> <p>The lux level over a 16 meter of radius should not be less than 5% at the point mentioned below in the lux level distribution chart. The average Lux should be min 8.0 lux and average/min = min 0.25.</p> <p>Higher light output will be preferred.</p>
Pole	Pole of hot deep Galvanized Iron Octagonal in single length for 7.0 mtr height
Duty cycle	<p>Dusk to dawn with following inbuilt dimming provision in the Charge Controller :-</p> <p>First 3 hours full light (min. 8.0 lux), 60% for next 3 hours (min. 5 lux) and rest of time at lower light (50%, min. 4 lux) level.</p> <p>(Higher light output will be preferred).</p>

MINIMUM TECHNICAL REQUIREMENTS / STANDARDS

SPV MODULES:

- i. Domestically manufactured PV Module with domestically manufactured solar PV cells should be used.
- ii. The PV modules should be made up of crystalline silicon solar cells and must have BIS certificate for IS 14286& IS 61730 (Part-I, Part II).
- iii. The efficiency of the PV modules should be minimum 19%.
- iv. PV modules must meet the latest specification of MNRE and the models and Manufacturers of PV Modules shall be included in the List of Models and Manufacturers for Solar PV Modules empanelled by MNRE as per its ALMM order (and also valid at the time of supply of material) from time to time. The PV modules used must qualify to the latest BIS standards Crystalline Silicon Solar Cell Modules. In addition, the modules must conform to IS 61730 Part-1 - requirements for construction & Part 2 - requirements for testing, for safety qualification or equivalent IS.
- v. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- vi. Other general requirement for the PV modules and subsystems shall be the Following:
 - a. The rated output power and efficiency of any supplied module should not be less than the power and efficiency defined in the bid. No negative tolerance shall be allowed.
 - b. The module shall be provided with a junction box with weather proof lid of sealed type and IP-65 rated.
 - c. I-V curves at STC shall be provided with the module.
- vii. The module should have the following minimum information laminated inside the module.

- Made in India (to be subscribed in words)
 - Company name /logo
 - Model number
 - Serial number
 - Year of make
- viii. Warranties:
- a. Material Warranty:
 - i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures for a period of twenty-five (25) years from the date of commissioning of the system.
 - ii. Defects and/or failures due to manufacturing (it should indicate the voltage and rated wattage of the module)
 - iii. Defects and/or failures due to quality of materials
 - iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the owner's sole option.
 - b. Performance Warranty: The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25-year period and not more than 10% after ten years' period of the full rated original output.

Note: PV Module/s must have to be supplied as per the latest MNRE guidelines and specifications applicable at the time of supply.

LITHIUM-FERRO-PHOSPHATE (LI-FE-PO4) BATTERY:

1. - Battery bank should consist of prismatic LiFePo4 cells of minimum 3.2V (nominal) 10Ah rating.
2. - Battery pack should have proper 'Battery Management System' (BMS) for cell balancing, over charge and over temperature protection.
3. - Battery should BIS certified with IS: 16046 (Part-2): 2018 from approved laboratory.
4. - Capacity of the battery shall not be less than 12.8 V (nominal), 50 Ah at STC, 640 Watt Hour for one unit. The total capacity of battery should be 640x4=2560 Watt Hour.
5. - The battery cycle life should be 2000 cycle at 95% discharge.
6. - BMS (Battery Management System) should be part of battery pack and battery pack enclosure should be as per standard. The battery pack should be integrated with the system in such way that it is theft proof and not removable from system. It should be installed with combination of module structure/luminaire. The height of battery pack will be approximate, 6.5 meters above the ground.
7. - The system must withstand wind velocity of 180 km/hr. The battery pack should be capable of high rate of heat dissipations. The battery box should be acid proof and corrosion resistant, hot dip galvanized metallic box (IP 65) with anti-theft locking arrangement.
8. - The battery should operate between temperature range of 0 degree C to 55 degree C. The other feature of the battery should be:

Sr. No.	Description	Specifications
1	Battery Configuration	12.8V- 200AH; Li-fe-PO4 (4x50AH)
2	Working Temperature Range (both for charging & discharging)	0-60 deg C
3	Storage Temperature Range	@ 0-25 Deg- 6 months

4	Cycle Life (Full charge to full discharge @25degC before capacity of battery falls below 75%)	more than 2000 Cycles
5	Battery Warranty	7 years (seven years)
6	Min. Capacity of Individual Cells	3.2V cell of 10 AH, 50AH
7	Type of Cell	Prismatic
8	Nominal Capacity	12.8 volt - 50AH of one unit
9	Nominal Voltage	12.8V
10	Voltage Range	10.5V - 14.6V
11	Total Energy	640 WHr
12	Rated Charging current	25 Amps
13	Maximum Charging current	20 Amps
14	Maximum Discharging Current	25 Amps
15	Discharge Cut off Voltage	>10.5V
16	Over Charge Cut off Voltage	14.4V+/- 0.2V
17	Charging Time	Around 5 - 5.5 Hours

LIGHT SOURCE:

1. - The light source will be of white LED type The color temperature of white LEDs used in the system should be in the range of 5500 degree K - 6500 degree K. Use of LEDs which emits ultraviolet light will not be permitted. The temperature of heat sink should be not increase more than 20 degree centigrade above ambient temperature during the dusk to dawn operation.
2. - The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher light output will be preferred. The light output from the white LED light source should be almost constant. The lamps, DC-DC driver and battery with battery management system (BMS) should be housed in aluminum die-casted casing suitable for outdoor use and shall comply with IP65.
3. - The lamps should be housed in an assembly suitable for outdoor use and shall comply with IP65. The LED housing should be made of pressure die cast aluminum having sufficient area for heat dissipation and heat resistant toughened clear glass/ high quality poly carbonate fitted with pressurized die cast aluminum frame with SS screws.

The temperature of heat sink should not increase more than 30 degree C above ambient temperature even after 48 hrs. of continuous operation. This condition should be complied for the dusk to dawn operation of the lamps while battery operating at any voltage between the loads disconnect and charge regulation set point.

4. - High power LED of minimum 1 watt each capacity capable to withstand maximum 1 amp driving current having lens angle greater than 120 degree shall be used. The LED of reputed make having LM 80 and LM 79 test report shall only be used.
5. - The LED efficacy should be more than 150 lumen / watt @ 350 mA, the total luminaire efficacy should not be less than 135 lumens per watt. (Including all losses) i.e the lumens output of each luminaire should not be less than 3000 lumens.
6. - All LED in circuit must be connected in series only. It must incorporate fail short mechanism in all LEDs. The LEDs used in the luminaire should have life time more than 50,000 hrs.

7. - The lumen depreciation of LED shall not be more than 30% even after 50,000 burning hours.
8. - Power consumption (input and output) of the each LED Luminaire/Lighting unit shall not be more than 22 W (including LED Driver power loss).
9. - The lux level over a 16 meter of radius should not be less than 5% at the point mentioned below in the lux level distribution chart.

The chart is plotted for 6.5 meter high, with lamp bracket arm of 1 meter with 5 degree. Grid spacing 1×1 meter. Maintenance factor 0.8. The average Lux should be min 8 lux and average/min = min 0.25.

10. - Other Parameters :

- s. LED DC current regulation - better than 3 %
 - s. Input - 12 VDC
 - t. Driver Type- DC-DC (as per IEC 62384)
 - u. CRI - 70 % Typical
 - v. Lighting quality- Free from glare and flickering and UV
 - w. Ambient temp- up to 50deg
 - x. DC to DC convertor efficiency > =90%
11. - The connecting wires used inside the luminaries, shall be low smoke halogen free, fire retardant e-beam cable and fuse protection shall be provided at input side.
12. - Auto resettable reverse polarity protection shall be provided.
13. - LED lighting unit shall comply with LM -79-08 Standards and copy of test certificate should be submitted.
14. - The make, model number, country of origin and technical characteristics of white LEDs used in the lighting system must be furnished.
15. - The luminaries must have light distribution polar curve. The bidder should submit the polar curve of luminaries in LM 79 report.
16. - The luminaire should be tested for all type tests as per IS 10322 Part 5 Sect 3 or IEC 60598-2-3 standards.

ELECTRONICS

MPPT charge controller to maximize energy drawn from the Solar PV array. The MPPT charger shall be microcontroller based. The PV charging efficiency shall not be less than 90% and shall be suitably designed to meet array capacity. The charge controller shall conform to IEC 62093, IEC 60068 as per specifications.

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SOLAR CHARGE CONTROLLER

Sr No.	Description	Specification
1	Charge controller Type	MPPT type -Maximum Power point Tracking.
2	Charge controller Rating @ Related Voltage	10 Amps
3	Module Rating	110 Wp @ 16.4 volt ± 0.2 V, if MPPT is not used with positive tolerance

		36 Cell configuration
		Voc- > 21 Volts
		Vmp-16.4 volt \pm 0.2 at STC without MPPT

- i. Protection against polarity reversal of PV array and battery, Over Current, Short Circuit, Deep Discharge, Input Surge Voltage; Blocking Diode protection against battery night time leakage through PV Module.
- ii. Electronics should operate 21volt and 11.2 volt and its efficiency should be at least 90 %.
- iii. The system should have protection against battery overcharge and deep discharge conditions. The numerical values of the cut off limits of lower voltage should not be less than 11.2 Volt and over voltage cutoff should be 14.6V.
- iv. Full protection against open circuit, accidental short circuit and reverse polarity should be provided
- v. Charge controller shall have automatic dusk-dawn circuit based on SPV module as sensor for switching on/off the high mast light without manual intervention. The sensor must not get triggered by impulse lighting like lightning flashes and fire crackers.
- vi. The self-consumption of the charge controller shall not be more than 20 mA at rated voltage and rated current.
- vii. Adequate protection shall also be incorporated under no-load conditions (i.e. when the system is ON & the load (LED Lamp is removed).
- viii. The system should be provided with 2 LED indicators: a green light to indicate charging in progress and a red LED to indicate deep discharge condition of the battery. The green LED should glow only when the battery is actually being charged.
- ix. All capacitors shall be rated for max. temp of 105°C.
- x. Resistances shall preferably be made of metal film of adequate rating.
- xi. Device shall have adequate thermal margin should be at least 25 degree below the allowable junction temperature while operating at an ambient temperature of 55 degree C and full load.
- xii. Fibre glass epoxy of grade FR 4 or superior shall be used for PCB boards.

Preferably the electronics (both charge controller and driver) should be housed in a box and installed on pole suitably in order to perform the repairing of electronics quickly without removing the whole luminaire.

TECHNICAL REQUIREMENT/STANDARDS

Item / System	Applicable BIS /Equivalent IEC Standard Or MNRE Specifications	
	Standard Description	Standard Number
Solar PV Systems	Crystalline Silicon Terrestrial PV Modules	IEC 61215 edition II / BIS 14286 and IEC 61730 part-1 and part-2 Test Certificates / Reports from IECQ / NABL/ MNRE accredited laboratory for relevant IEC / equivalent BIS standard. IEC 62093 Equivalent BIS Std.
Charge Controller/MPPT		
Units and Protections		
Storage Batteries	LiFePo4	Tested as per IS 16046 (Part 2):2018
Cables	2.00 mm DC Cable	EN 50618 DC Cable
Luminaries and Charge Controller housing		IP65
LED	LED performance	LM -80-08
	Luminary performance	LM 79-08

MECHANICAL HARDWARE

1. A galvanized metallic frame structure to be fixed on the pole to hold the SPV module(s). The frame structure should be fixed at 30 degrees from horizontal facing true south.
2. The pole should be hot deep Galvanized Iron Octagonal pole in single length for 7.0 mtr. height as per specification as under:
 - ii. The Octagonal poles shall be hot deep galvanized. The material of pole shall be as per specification of BS EN 100025, ISO 1461.
 - iii. The size of the pole shall be min 75 mm at Top side, 150 mm at bottom side with thickness of 4 mm minimum.
 - iv. The base plate of pole shall be of size 260 X 260 X 18 mm duly welded to pole.
 - v. Pole should have the arrangement at top for mounting of Solar panel of design capacity with mounting structure at an angle of latitude $\pm 2^{\circ}$ degree.
 - vi. The four LED luminaire shall be mounted on this pole at height of 6.5 meter from pole bottom.
 - vii. The pole shall be mounted on suitable RCC foundation at least 1.25-meter-deep and 0.5 meter above ground with 4/6/8 bolt of min 20 mm size.
 - viii. The Nut -Bolts in battery box and panel structures should be proper riveted to ensure the theft.

BATTERY BOX:

The battery box should be corrosion resistant, hot dip galvanized metallic box (IP65) with anti-theft locking arrangement. The size of box should be as per battery pack size. The battery box is to be properly rest/mounted on pole approx. 6.5 meters of height from ground level. The edges of box should be turned properly to give smooth edge and good strength. Components and hardware shall be vandal and theft resistant. All parts shall be corrosion-resistant.

ELECTRIC CABLE

The electric cable used shall be twin core PVC insulated water and UV resistance copper cable of minimum size 2.00 mm thickness. Cable shall meet EN 50618 standard for DC cables.

OTHER FEATURES

A toll free number is to be embossed/ punch/ permanent painting on pole between 1-1.5 meter above from ground level by contractor/ bidder, which in case of non-working/ operational problems etc of system will be dialed by the beneficiary etc to lodge a complaint in respect of system problems. The contractor/ bidder will have to rectify the same to make/ restore the system to working position within 72 hours in the warrantee period of 7 years, failing which the system may be get rectified on contractor/ bidder cost and the cost will be recovered by contractor/ bidders pending claims what so ever and appropriate action as per noncompliance etc of agreement will be considered/taken.

INSTALLATION OF SYSTEM:

The system should be properly installed at site. The SPV module mounting structure along with telescopic octagonal pole should be properly grouted depending upon the location and requirement of the site. The grouting should be such that it should withstand the maximum wind speed /storm of 180 kmph. The pole should be rest on a suitable foundation. (RCC Foundation with iron rings size 600 mm x600 mm x 1250 mm deep and 500 mm above the ground level. must have 4/6/8 nos. foundation bolts of 1200 mm & 20mm dia.) Adequate space should be provided behind the PV module/array for allowing un-obstructed air flow for passive cooling. Cables of appropriate size should be used to keep electrical losses to a bare minimum. Care should be taken to ensure that the battery is placed with appropriate leveling on a structurally sound surface. The control electronics should not be installed directly above the battery. All wiring should be in a proper conduit or capping case. Wire should not be hanging loose. Any minor items which are not specifically included in the scope of supply but required for proper installation and efficient operation of the SPV systems is to be provided by the manufacturer as per standards.

WARRANTY

The mechanical structures, electrical works including power conditioners/inverters/charge controllers/ maximum power point tracker units/distribution boards/digital meters/ switchgear/ storage batteries, etc. and overall workmanship of the systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 7 years. The warranty & maintenance is elaborated as under:-

- The PV modules will be warranted for a minimum period of 25 years from the date of supply. (Output wattage should not be less than 90% at the end of 20 years and 80% at the end of 25 years).

- The mechanical structures, electrical components including battery and overall workmanship of the Solar PV White- LED High Mast Light Systems must be warranted for a minimum of 7 years from the date of commissioning and handing over of the system..
- The Comprehensive Maintenance (within warranty period) shall be executed by the firm themselves or through the authorized dealer/ service center of the firm in the concerned district.
- Necessary maintenance spares for seven years trouble free operation shall also be supplied with the system.
- The contractor/ bidder shall be responsible to replace free of cost (including transportation and insurance expenses) to the purchaser whole or any part of supply which under normal and proper use become dysfunctional within one month of issue of any such complaint by the purchaser.
- The service personnel of the Successful Bidder will make routine quarterly maintenance visits. The maintenance shall include thorough testing & replacement of any damaged parts Apart from this any complaint registered/ service calls received / faults notified in the report generated by the IVRS should be attended to and the system should be repaired/ restored/ replaced within 3 days.
- A separate Service & Maintenance passbook shall be maintained of the supplied systems as per the format provided by HAREDA. The deputed personnel shall be in a position to check and test all the components regularly, so that preventive actions, if any, could be taken well in advance to save any equipment from damage. Any abnormal behavior of any component shall be brought to the notice of HAREDA for appropriate action.
- Normal and preventive maintenance of the Solar PV White- LED High Mast Light systems such as cleaning of module surface, topping up of batteries, tightening of all electrical connections, cleaning & greasing of battery terminals, also the duties of the deputed personnel during quarterly maintenance visits.
- During operation and maintenance period of the Solar PV White- LED High Mast Light systems, if there is any loss or damage of any component due to miss management/miss handling or due to any other reasons pertaining to the deputed personnel, what-so-ever, the supplier shall be responsible for immediate replacement/rectification. The damaged component may be repaired or replaced by new component.

TRACEABILITY OF THE PRODUCT TO BE SUPPLIED

In order to prevent the misuse of the product such as unauthorized sale or diversion to the open market, the following incorporation shall be made in the product.

- a. Engraving (or) Screen printing of HAREDA with logo at a suitable place on the main components viz., SPV Panel, Battery, LED Lighting Units to be used in the installation of the solar high mast lighting systems.
 - b. The unique system ID number as provided by HAREDA shall be embossed or punch or permanently riveted on each pole and battery box of the system. The UID number painting or marking will not be allowed.