ITEM 680.8223XY10 – SOLAR POWERED FLASHING BEACON

DESCRIPTION

Under this item, the Contractor shall furnish and install new Solar Powered Flashing Beacon(s) at location(s) indicated in the contract documents.

MATERIALS

Each Solar Powered Flashing Beacon unit shall consist of a self-contained solar engine, up to four 200 mm or 300 mm yellow (or red) LED signal modules and signal housings, and mounting hardware, depending on the beacon configuration specified in the contract documents. The solar engine shall contain all electronics, batteries & solar panels with the capacity to power the LED module(s), as well as an external device for remote activation (if required in the contract documents). No additional electrical cabinet is required. Each Solar Powered Flashing Beacon unit shall meet, at a minimum, the requirements of subsection 724, Traffic Signals, of NYSDOT Standard Specifications. The system shall also conform to all provisions of the current version of the Manual of Uniform Traffic Control Devices (MUTCD), Flashing Beacons.

Mechanical Specifications

The solar panel shall be integrated with the solar engine, which shall be constructed from powder coated (green, black, or yellow) aluminum. All electronics (including battery/battery pack) shall be mounted within the solar engine, with no external control cabinet or battery cabinet required. The solar engine shall be vented to provide cooling of the battery and electronic system. Venting shall be internally covered by fine wire mesh (to prevent intrusion of insects and/or debris).

The solar engine shall have the provision to mount an external device for remote activation. The solar powered system shall have the capability to power such device. Solar engine must contain sufficient space to house a sealed enclosure for the third party device.

The solar engine shall have the provision to be adjustable, through its mounting bracket(s), in order for the solar panel(s) to receive maximum solar input.

Mounting

The entire assembly, including solar engine, signal housing(s), LED module(s), and bracket(s) shall be provided with hardware for mounting as shown on the contract documents. Traffic signal sections, brackets and hardware shall meet the requirements of Subsection 724-04 of NYSDOT Standard Specifications. Signs and brackets furnished under this item shall meet the requirements of subsections 730-01, 730-05.02, and 730-22.

Solar / Battery System

The solar engine shall include one high-efficiency 10W (for single 200 mm red beacon-minimum size application) or up to a standard 80W (for four 300 mm yellow beacons-maximum size application) solar panel no larger than the footprint of the engine housing. The solar engine shall also house a field replaceable, sealed, and maintenance-free, battery/battery pack. The solar panel and battery system shall be 12 Volt DC. Batteries shall have an expected life span of 5 – 8 years.
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A battery bracket shall enclose the battery/battery pack in a manner to restrict the thermal expansion of the battery and mechanically secure it within the solar engine housing.

The system shall have an auxiliary 12 VDC power output to power third party devices such as wireless radios or sensing equipment.

Signal Housing

The signal housing(s) shall meet the current specifications of the MUTCD, and the NYSDOT Standard Specifications.

The solar engine shall not overhang the signal head(s), so as not to restrict mounting a signal head back plate. The bracket assembly shall be constructed such that the signal head(s) can be removed easily in the field without removing the solar engine. The bracket assembly shall be designed to take the torsion and bending load of the solar engine. The signal head(s) shall not be subjected to torsional or bending load of the solar engine.

The signal housing(s) must be able to rotate independent from the bracket(s) for lens alignment.

LED Signal Module

The LED signal module shall conform to the specifications listed in the current version of the MUTCD, and the NYSDOT Standard Specifications. The size of the LED modules (yellow or red) may be 200 mm or 300 mm nominal diameter, depending on ultimate use of flashing beacon assembly as indicated in the contract documents.

NOTE: 200 mm diameter LEDs to be used for speed limit signs only

Operational Specifications

- The system shall conform to all standards for flashing beacons as required in the current version of the MUTCD and NYSDOT standard specifications.
- The beacon(s) shall be flashed at a rate compliant with the current version of the MUTCD.
- The beacon(s) shall have an automatic night dimming feature.
- The beacon(s) shall have a maximum operating capacity of 30 continuous days without solar charging.
- The beacon(s) shall be capable of operating 24 hrs/day, 365 days/year
- The beacon(s) shall automatically reduce light output in case of low battery situations, reducing risk that the beacon(s) will fail entirely under conditions of limited, or no solar charging.

Activation

The beacon shall be capable of operating continuously when the battery is connected. The beacon shall have the option to be turned on by a third party switch or third party device (eg: preset timer, etc) with a compatible contact closure output.
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Environmental Specifications
The system shall be able to withstand and operate at temperature extremes of -40°C to +71°C.

All components of the flashing beacon assembly shall be weatherproof and corrosion-resistant. The solar engine shall also be vandal-resistant. The beacon heads shall be premium-grade UV-resistant.

Electrical Standards
All electrical components and wiring shall be approved to CSA and/or UL standards.

Quality Assurance
The product must be FCC certified to comply with all 47 CFR FCC Part 15 Subpart B Emission requirements.

Manufacturer shall be ISO 9001 Certified

CONSTRUCTION DETAILS
The Contractor shall submit to the Engineer for approval: complete shop drawings, detailed specifications, catalog cuts, parts lists, instruction sheets, and wiring diagrams for the equipment to be installed.

The Contractor shall, in accordance with the manufacturer’s recommendations, mount the solar engine, 200 mm or 300 mm diameter yellow (or red) LED signal section(s) as shown in the contract documents. The Contractor will be required to install wiring, connecting the solar engine and the LED signal head(s) to complete the work.

The Contractor shall secure the services of the manufacturer’s field advisor, as needed, for installing and testing each solar powered flashing beacon assembly and for orienting the solar panel array (solar engine) for optimum performance.

METHOD OF MEASUREMENT
The work will be measured by the actual number of solar powered flashing beacon assemblies installed in accordance with the contract documents and as directed by the Engineer.

BASIS OF PAYMENT
The unit price bid for each solar powered flashing beacon assembly shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work as specified, including, but not necessarily limited to solar engine, signal sections, and all mounting brackets and hardware. Each solar powered flashing beacon assembly shall consist of up to four 200 mm or 300 mm yellow (or red) LED signal section(s), one solar engine, mounting hardware, and wiring as required. Unit price bid excludes sign panel(s), sign panel mounting brackets and fasteners, and support post/pole.
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Note in item description X = the number of LED signal section(s), Y = the color of the LED 1 = red, 2 = yellow