

“PURCHASE AND INSTALLATION OF SOLAR POWERED LIGHTS FOR TOWER  
ROAD PARK CRC”

RFB NO. 2008-388-00-00-otm

**SCOPE OF PROJECT**

**Design:** All components of solar lighting system shall be mounted on pole and shall not be accessible from the ground without mechanical means.

**Operation:** Lights are stand-alone solar powered systems – not connected to grid power. Overall, the system operates automatically – without the use of a separate photo cell. The solar panel itself acts as a photocell. It senses a low light level at dusk and turns the light on – to run full dusk to dawn, and adjust automatically as the days get longer. These functions are regulated by the controller. There is no day to day maintenance or adjustment required.

**Performance Criteria and Considerations:**

- ✓ Solar panels protected on top by tempered glass
- ✓ Free standing, each unit self-contained
- ✓ Powered by sunlight
- ✓ LED light source – multi-junction strip type LED's
- ✓ 100,000 hours rated life
- ✓ 2182 lumens total output with no lens losses from LED packaging
- ✓ 5100 Kelvin – bright white color light
- ✓ 10 days autonomy (battery reserve) for all weather conditions
- ✓ Advanced Power Management LED driver to extend lamp operation and conserve battery power in times of extended inclement weather
- ✓ Mounted high on pole for vandal resistance – no wires running through pole to the ground
- ✓ Sized according to US DOE
- ✓ Durability in design and manufacture
- ✓ 25 year warranty on solar panels
- ✓ 5 year system warranty
- ✓ USA based ISO certified manufacturing facility

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**Written Specifications**

**A. Solar Power Unit**

The solar module shall contain polycrystalline solar cells, protected on the upper surface by low iron tempered glass. The solar module shall have a rugged aluminum frame which connects to brackets for attachment to the mounting arm at a 45 degree tilt. All wiring connections shall be with weather resistant plugs as to keep installation simple, eliminate incorrect wiring, and prevent exposure to corrosion. Stainless steel hardware shall be used throughout. Solar modules shall carry a 25 year manufacturer’s warranty.

The solar module array shall exhibit the following characteristics:

Cells: poly-crystalline silicon cells  
 Total Watts: 80 watts  
 Tilt Angle: 45 degrees  
 Connections: Weather resistant plug, 4 & 2 pin, color coded  
 Panel Warranty: 25 Year Manufacturer’s warranty on panels

**B. Fixture**

The overhead fixture shall be a die cast corrosion resistant aluminum style fixture with a glass swag lens. Fixture enclosure is to be water tight, sealed, dust and insect free with electrostatic powder-coated finish. Fixture and light source will contain no mercury or lead and present no environmental disposal issues. The electrical connection shall be with weather resistant plugs to simplify installation, eliminate reverse wiring, and prevent exposure to corrosion.

The fixture shall exhibit the following characteristics:

Type: Die cast corrosion resistant aluminum style fixture  
 Finish: Electrostatic powder-coated finish  
 Fixture Enclosure: Water tight, sealed, dust and insect free  
 Lens: Swag glass lens  
 Intrusion Protection

**C. Light Source (LED Light Emitting Diode)**

The light source shall be solid-state strip LED (light emitting diode) with digital driver. 100,000 hour rated lamp life, 30 watt LED, 78 lumens per watt out of fixture at rated power.

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LED's should be multi-junction strip type LED's – 4 strips per quad, and 48 LED's per strip for a total of 192 LED's per quad. **Each fixture shall have one quad for a total of 192 LED's.** LED's mount directly to heat sinking plate. Reflector system captures light emitted from the LED and directs the target area. No lens losses from the LED packaging. Reflector coated to prevent degradation of reflective surface. 50G shock rating.

The light source (LED) shall exhibit the following characteristics:

- Type: Strip LED with digital driver
- Rated lamp life: 100,000 hours
- Lamp Lumens: 78 lumens per watt at rated power
- LED: LED 30 watt, 5100 Kelvin 50,000 hour guaranteed lamp life
- Heat Removal: LED's mounted directly to heat sinking plate
- Reflector: Reflector system captures light emitted from the LED and directs to the targeted area
- Shock Rating: 50 G's
- Environmental: Contains no mercury or lead
- LED Drive: Electronic driver
- Capacitors: No electrolytic capacitors shall be used Power Management shall conserve battery power in times of extended inclement weather

#### **D. Controller**

The controller is a microprocessor based charge controller designed exclusively for the running of solar lighting applications. Controller will feature automatic charge termination for batteries. Low voltage disconnect set to extend battery life. Built in test routines for checking the installation of solar lighting system. Pulse width modulation charging algorithm. Controller autosenses system voltage. Weatherproof connectors. Circuit protected with UL approved weather sealing. Charge current rating of 20 amps.

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Controller shall be located inside the battery box. Controller shall be factory pre-set for 4/2 split for a total of 6 hours runtime each day.

Charge/Load Controller shall exhibit the following characteristics:

- Method of charge: Pulse width modulation charging algorithm
- LVD Disconnect: Set to extend battery life
- Test routines: Built in for checking installation of solar lighting system
- Connectors: Weatherproof connectors
- Location: Controller located inside battery box
- Run time: Factory pre-set for 4/2 split for a total of 6 hours runtime each day.

**E. Battery and Battery Enclosure**

Battery shall be of sealed valve, regulated gel type, requiring no maintenance, air shippable, capable of 1300 minimum cycles to 30% depth of discharge, and rated for 99 amp hours at the 100 hour rate. 10 days autonomy (battery reserve) for all weather conditions. The wire harness shall include a weather resistant ATO fuse holder and plug to eliminate system failure due to corrosion, and accommodate quick/easy installation.

The battery enclosure shall be aluminum, vented and shaded by solar array with access door loaded from front. Battery enclosure houses battery and controller. Entire unit shaded by the panels to avoid heat. Mounted high on the pole, avoids vandalism.

The battery shall exhibit the following characteristics:

- Type: Sealed valve regulated gel
- Voltage: 12 volts each
- Location of Box: High on pole, under panels, avoids heat and vandalism

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Enclosure: Aluminum vented

Access Door: Loaded from front

Battery Reserve: 10 days

Power Management: Protects battery life in periods of bad weather

Regular Maintenance: None

### **F. Brackets and Arms**

The support frame is constructed of tubular extruded aluminum. The fixture support arm is constructed of aluminum tube. All hardware is stainless steel. The overall Effective Projected Area of the entire system including luminaire shall not exceed 14.87 square feet and total weight of 275 pounds.

Solar Array Support Frame: Side of pole

Angle of Tile: 45 degrees

Fixture Support Arm: 2 and 6 foot aluminum

Material: Aluminum

Hardware: Stainless Steel

### **G. Pole**

Standard stainless steel or aluminum pole to be provided and installed

### **H. Wire Connections**

All wire connections shall be with weather resistant plugs, keyed to make installation quick and easy and to eliminate failure due to corrosion and incorrect wiring.



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**I. Warranties**

Solar Panel:	25 years
Aluminum Panel Backing:	20 years
Aluminum Arm:	20 years
Aluminum Bracket:	20 years
Aluminum Pole:	20 years
Battery Box:	20 years
Reflector:	10 years
Luminaire:	5 years
Battery:	5 years
Controller:	5 years
LED Lamps:	5 years