

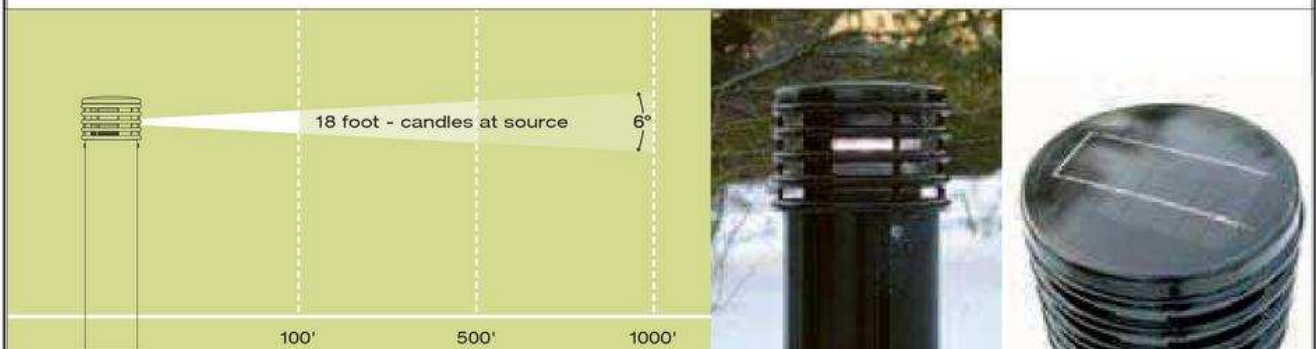
ANNAPOLIS SMART BOLLARD

Annapolis™ Smart Bollard is the first bollard with integrated solar powered lighting provided by advanced light-emitting diode (LED) technology. This bollard is not just the smartest in its class. It's in a class all its own.

Smart Bollard was developed in response to customer requests for a lighted bollard designed for use in areas where wiring is unfeasible or inconvenient, or where security concerns demand lighting that is off the grid. It is a reliable, economical, energy-saving solution for marking pathways, dividing pedestrian and vehicular traffic, and providing security in settings ranging from corporate and university campuses to urban streetscapes.

Smart Bollard adds new function to a familiar form. It integrates a completely self-contained solar-powered LED lighting unit, encapsulated in a durable weatherproof polycarbonate/polymer housing, into the standard 6" diameter Annapolis bollard.

Smart Bollard casts directional light above the ground. Its sixteen white LEDs provide 360° visibility with a range exceeding one mile. Because it requires no wiring, Smart Bollard breaks new ground as the first removable bollard with integrated lighting.



The Benefits of Being Smart:

- Smart Bollard is solar powered. It is environmentally responsible in its reliance on sustainable energy. And the absence of wiring saves on installation, maintenance and energy costs.
- Smart Bollard is off the grid. In case of power emergencies due to natural or man-made causes, it just glows on.
- Smart Bollard is intelligent. Microprocessor technology automatically turns lights on at dusk and off at dawn. An "intelligent energy management system" calibrates light output to the amount of energy in storage to ensure uninterrupted function.
- Smart Bollard is efficient. LED light is generated by tiny silicon chips which require a much smaller electrical current than incandescent bulbs, waste almost no energy through heat dissipation. And high-intensity LEDs typically enjoy over 100,000 hours of life. As a result, they are 100 times as efficient at producing light as incandescent bulbs and last about 20 times longer.
- Smart Bollard is state of the art. The completely unitized light, which has no internal moving parts, is environmentally sealed in a clear, patented polymer dome that traps sunlight and protects the solar panel from damage and dirt. This solar powered LED lighting technology was developed for commercial navigation where durability and reliability are the bottom line. Its crystalline solar panel has been tested under extreme environmental conditions and is up to 14% more efficient than solar panels used in consumer products. These lights are used by the US armed forces and in industrial/commercial applications, including buoys, piers, wharves and aquaculture facilities, around the world.

How the Annapolis Smart Bollard Works:

The solar panel in the light collects energy from the sun and converts it to electrical current. Energy is stored in a sealed lead-acid rechargeable battery that provides a large energy capacity for its size and delivers extremely reliable power output over a long period of time. (*expected battery life is five years*) The solar panel begins charging at dawn and discharging at dusk when the light automatically goes on.

Location Selection

Smart Bollard requires adequate sunlight and suitable ambient temperature to function effectively. It is a viable solution for areas with an average of at least 3 hours or more sunlight per day year round, at latitudes within 55° North or South, and at a temperature range of -40° F to 176° F. Care must be taken in the placement of units. Even in sunny locations the light will not function if the bollard is in the shade for most of the day. Under typical conditions, Smart Bollard will run for up to 15 hours per day and require three hours daylight to recharge. With a fully charged battery, under extreme weather conditions, Smart Bollard can operate for up to 150 hours without recharging.

Warranty

Smart Bollard is a Landscape Forms product that meets the company's stringent standards of quality, durability and performance. It is covered by the Landscape Forms three-year warranty.

Specifications:

Sizes	6" diameter x 33" high
Bollard Tube	structural steel
Bollard Top	aluminum casting
Optional Protective Sleeve	polyethylene
Metal Finish	Pangard II® Powdercoat. Standard, optional and customs colors available.
Mounting	6" diameter embedded or removable with embedded socket.
Solar Light Specifications:	
Solar Lighting Components	encapsulated in patented domed polycarbonate housing
Light Output Effective Intensity	-2 candela
Light Output Nominal Night Range	-1.5 NM
Horizontal Output	360°
Minimum Autonomy	150 hours
Min. Equivalent Peak Sun Hours to Maintain Min. Autonomy	3 hours
Latitude Range	55° S to 55° N
On/Off Level	70/100 lux
Illumination Technology	16 White LEDs
Lifespan of LEDs	Up to 100,000 hours
Solar Panels	Mono-Crystalline/Potted with UV-protected polyurethane and domed for higher efficiency
Maximum Power	1.4 Watts
Efficiency	14%
Battery	Pure-lead thin plate with starved electrolyte
Nominal Voltage	4 Volts
Capacity	5 Amp-hr at 10-hr discharge rate
Lens Material	Polycarbonate
Weight	4.0 lbs
Temperature Range	-40° F to 176° F
Waterproof/Explosion Resistant/CE Approved	



Annapolis Smart Bollard sealed light with solar panel is protected by U.S. Patent No. 6,019,985 and U.S. Patent No. 6,573,659

Solar Bollard Components

Solar collector, storage battery, light-emitting diodes (LEDs), and circuitry are environmentally encapsulated in polycarbonate housing. Light turns off during daytime charge cycle. Sixteen white LEDs provide 360° visibility with a range over one mile. Light is maintenance free over a life of approximately five years.



Sizes, Mounting Options, Finishes and Colors

Sizes:

6" nominal dia. x 33" height.

12" nominal dia. x 33" height.

Mounting Options: 12" bollard is embedded only. 6" bollard permanently embedded or removable with embedded socket.

Finishes: Finish on metal is Landscape Forms' Pangard II® finishing process that includes a rust inhibitor and topcoat finish of thermosetting polyester powdercoat that is U.V., chip and flake resistant.

Colors: Bollards are available in a selection of standard colors. Optional and custom colors available at additional cost. Protective sleeves are available in Black or Silver. Custom color sleeves are available on order of 50 or more for an additional cost.

Technical Data

Recycled Content: The Annapolis bollards have a recycled material content of 80% or greater. The post consumer content is 51% or greater and the pre consumer content is 28% or greater.

All bollards are at least 97% recyclable.

Light intensity: The intensity at the source is 20 foot-candles for the low voltage light and 18 foot-candles for the solar light.



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