



Greenshine



LITA

Cost Effective Solar Lighting Solutions





## Light Fixture (GS-LED-L30)

Luminaire Input Voltage	DC 12V
Power Consumption	10W   20W
Lumen	1156   2119 lumens
Color Temperature	3000-4000 K
IES Lighting Type	Type II   III   V
Material	Die-cast aluminum



## Solar Panel ( 1 or 2 Units)

### 110W (Lita 10)

### 180W (Lita 20)

Rating Power	110 W	180 W
Maximum Power Voltage	17.60 V	18.95 V
Maximum Power Current	6.25 A	9.50 A
Open Circuit Current	21.7 V	22.74 V
Short Circuit Current	6.71	9.98
Size	47.5" x 27"	58.5" x 27"
Weight	29.5 lb	23.4 lb

## Battery (1 or 2 Units)

Battery Type	GEL Deep Cycle Lead-Acid
Operating Voltage	12 V
Capacity	80 Ah at 20 hr-rate to 1.75 V per cell at 77°F
Dimensions	13(L)×7(W)×8.5(H) (in)
Expected Life	5 ~ 7 years

## Solar Charger

Operating Voltage	12 V/24 V auto recognition
Max. Charge / Load Current	5 A/ 10 A/ 20 A (different models)
Night / Day Detection	2.5 V – 10 V
IP Class	IP68

## Pole

Height	14 ft
Diameter	5.5" at the bottom, 3" at the top
Thickness	5/32"
Material	Galvanized Steel
Finishing	Powder Coating





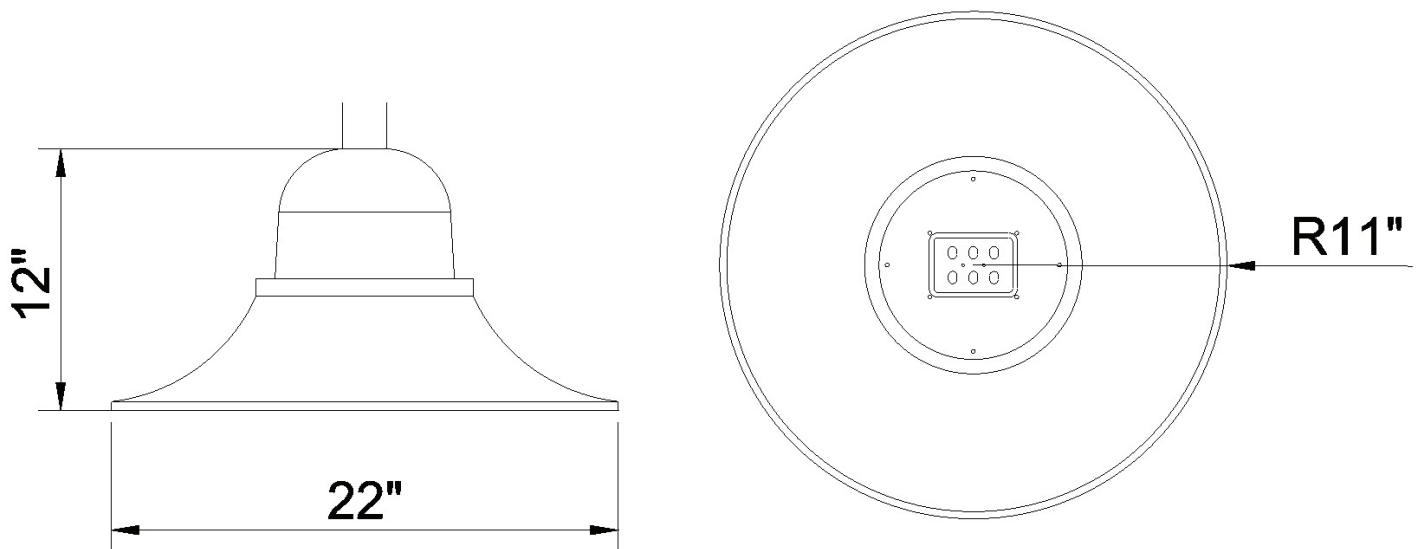
## SPECIFICATIONS

Luminaire Input Voltage  
Power Consumption  
Lumen Output  
Color Temperature  
IES Lighting Type  
Material  
Lens  
IP Class  
Insulation  
Operating Temperature  
CRI

DC 12V | 24V  
10W | 20W  
1156 | 2119 lumens  
3000-4000 K  
Type II | III | V  
High pressure die-cast aluminum  
5mm toughened glass, optical grade PMMA  
IP 65  
Class I  
-30°C ~+50°C / -22°F ~+122°F  
≥70

**Weight:** 8.3 kg | 18.3 lb

## DIMENSIONS



# GREENSHINE SOLAR PANEL

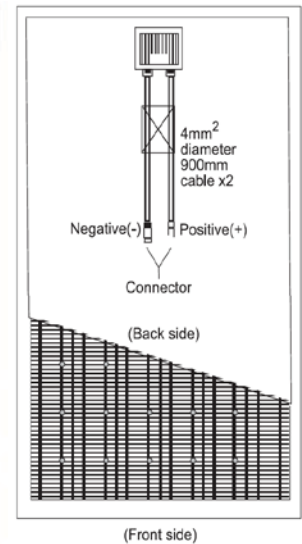
Solar Powered LED Lighting System



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## OVERVIEW

- Mono-Crystalline solar cells
- Aluminum frame with a unique design to withstand strong winds
- Highly resistant tempered glass
- Multilayer EVA encapsulation with triple layer back sheet
- 25-year power output warranty: 5 years/95%, 12 years/90%, 25 years/80%.



## Rating Power

110W

180W

Product Tolerance	± 3%	± 3%
Maximum Power Voltage	17.60V	18.95V
Maximum Power Current	6.25A	9.50A
Open Circuit Voltage	21.7 V	22.74 V
Short Circuit Current	6.71 A	9.98 A
Frame	Anodized aluminum, 4mm thickness	
Dimensions	1208mm x 682mm 47.5" x 27" 13kg   29.5lb	1486mm x 682mm 58.5" x 27" 10.6kg   23.4lb
Test Temperature	25°C   77°F, 1000w/m², Air Mass 1.5	
Junction Box / Wiring	IP65 Junction box with 900mm cable with MC4 connectors	



# GREENSHINE GEL-TYPE BATTERY

Solar Powered LED Lighting System



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## OVERVIEW

GEL deep cycle battery with a 12 years floating design life is especially designed for frequent cyclic discharge under extreme temperature.



### GS-GEL-H80      GS-GEL-H120      GS-GEL-H150      GS-GEL-H200

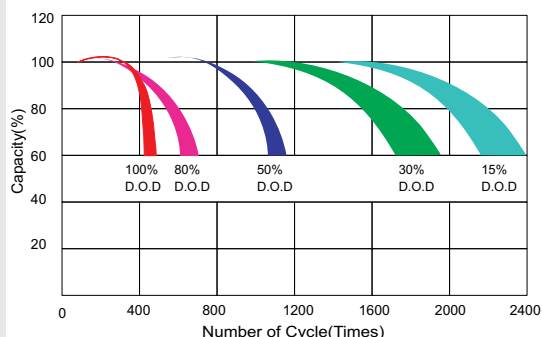
Cells per unit	6	6	6	6
Voltage per unit	12V	12V	12V	12V
Capacity	80Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F	120Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F	150Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F	200Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F
Weight	26kg / 58lb	38kg / 84lb	46kg / 100lb	59.2kg / 131.5lb
Dimensions L x W x H	330 x 172 x 214(mm) 13" x 7" x 8.5"	406 x 173 x 233(mm) 16" x 7" x 9.2"	483 x 170 x 240(mm) 19" x 6.7" x 9.5"	522 x 240 x 218(mm) 20.5" x 9.44" x 8.7"
Max Discharge Current	800A (5 Sec)	1200A (5 Sec)	1500A (5 Sec)	2000A (5 Sec) <sup>2</sup>
Operating Temp. range	-40°C~60°C   -40°F~140°F			
Flot Charging Voltage	13.6 to 13.8 VDC / unit average at 25°C / 77°F			
Recommended max. charging current	16A	24A	30A	40A
Self-discharge	Valve Regulated Lead Acid can be stored for more than 6 months at 25°C/77°F. Self-discharge ratio less than 3% per month at 25°C/77°F. Please charge batteries before using.			
Equalization and cycle service	14.6 to 14.8 VDC / unit average at 25°C / 77°F			
Terminal type	5ft cooper wire leads from the battery case			



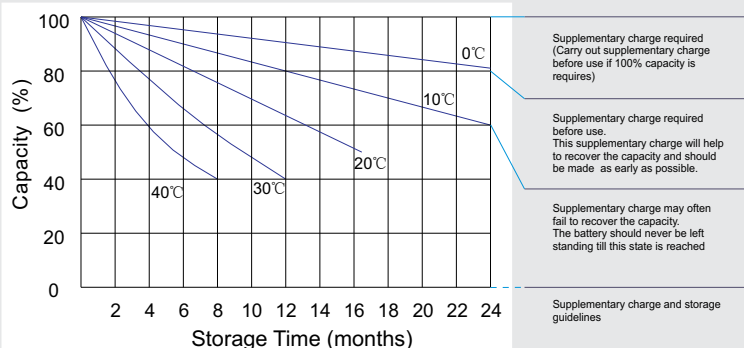
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# GREENSHINE GEL-TYPE BATTERY

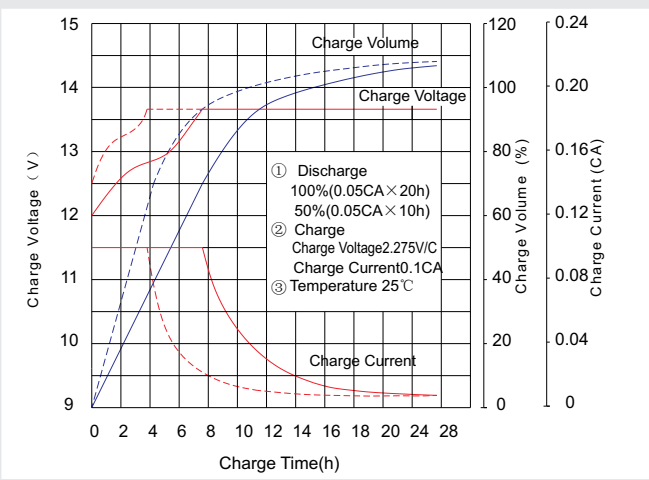
Life characteristics of cyclic use



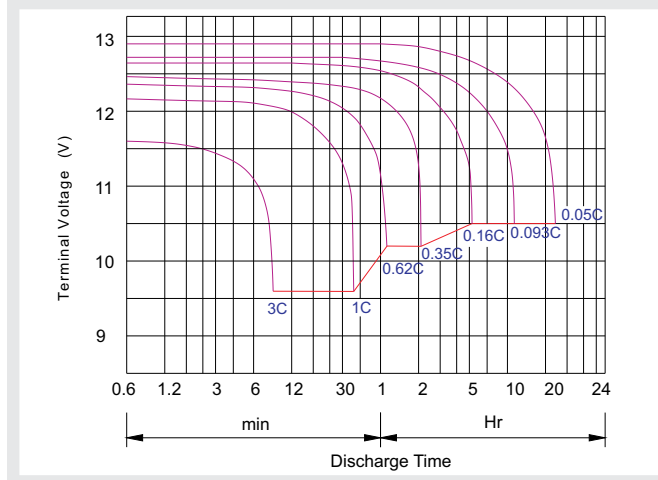
Storage characteristic



Charge characteristic curve for cyclic use



Discharge characteristic curve



## Capacity Factors With Different Temperature

Battery Type		-20°C	-10°C	0°C	5°C	10°C	20°C	25°C	30°C	40°C	45°C
GEL Battery	6V&12V	50%	70%	83%	85%	90%	98%	100%	102%	104%	105%
	2V	60%	75%	85%	88%	92%	99%	100%	103%	105%	106%
AGM Battery	6V&12V	46%	66%	76%	83%	90%	98%	100%	103%	107%	109%
	2V	55%	70%	80%	85%	92%	99%	100%	104%	108%	110%

## Discharge Current VS. Discharge Voltage

Final Discharge Voltage V /cell	1.75V	1.70V	1.60V
Discharge Current (A)	(A) ≤0.2C	0.2C < (A) <1.0C	(A) ≥1.0C

**Charge the batteries at least once every six months, if they are stored at 25°C.**

Charging Method:

Constant Voltage	-0.2Cx2h+14.4-14.7Vx24h, Max. Current 0.2C
Constant Current	-0.2Cx2h+0.1Cx12h
Fast	-0.2Cx2h+0.2Cx6h

Bolt	M5	M6	M8
Terminal	F3 F4 F13 F18 T25 T26	F8 F11 F12-1 F15	F5 F9 F10 F12 F14 F16
Torque	6-7N-m	8-10N-m	10-12N-m

## Maintenance & Cautions

Cycle service
※ Avoid battery over discharge, especially battery series connection use.
※ Charged with recommend voltage, ensure battery can be full recharged.
In general, recharge capacity should be 1.1-1.15 times discharge capacity.
※ Effect of temperature on cycle charge voltage: -4mV/°C/Cell.
※ There are a number of factors that will affect the length of cyclic service.
The most significant are depth of discharge, ambient temperature, discharge rate, and the manner in which the battery is recharged.
Generally speaking, the most important factors is depth of discharge.



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# GREENSHINE CONTROLLER

## Solar Powered LED Lighting System

### FEATURES

- Corrosion-proof epoxy-encapsulated PCB (IP68)
- Four-stage battery charging (main, float, boost, equalization)
- Temperature compensated
- Automatic system voltage recognition (12V/24V)
- Customized by Greenshine to fit specific needs of clients
- Easy to install

### SPECIFICATIONS

System Voltage

Max. charge / load current

#### Deep discharge protection:

Cut-off Voltage

Reconnect Level

Overvoltage Protection

Undervoltage Protection

Max. Panel Voltage

Temperature compensation

(Charge Voltage)

Ambient Temperature

Max. Altitude

Battery Type

#### Adjustment Range:

Evening / Morning Hours

Night / Day Detection

Wire Cross Section

Type of Protection

12V | 24 Auto Recognition

5A | 10A | 20A (Different Models)

11V - 12V | 22V - 24V

12.8V | 25.6V

15.5V | 31.0V

10.5V | 21V

$U_{BATmin} + 30V$  (if module and battery are connected with correct polarity)

-25mV | K at 12V

-50mV | K at 24V

-40°C to +60°C, -40°F to +140°F

4,000m above sea level

Lead acid (GEL, AGM, flooded)

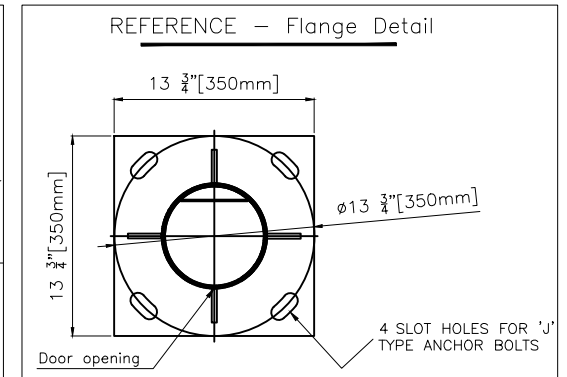
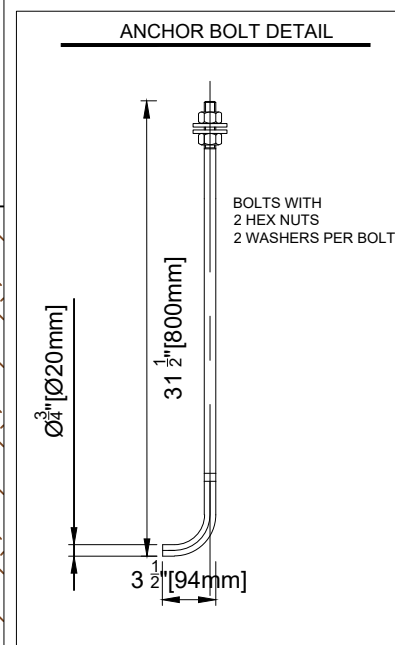
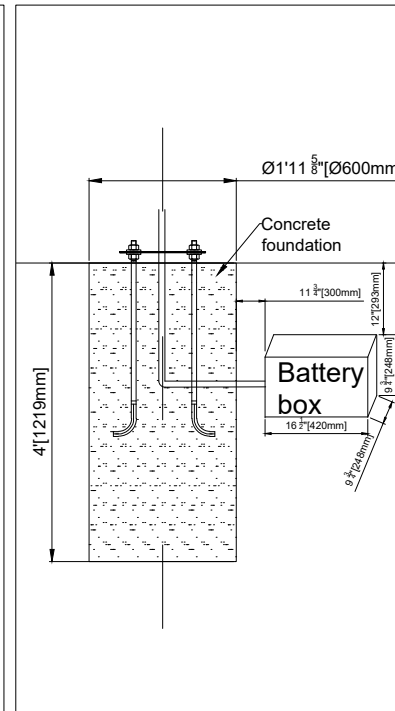
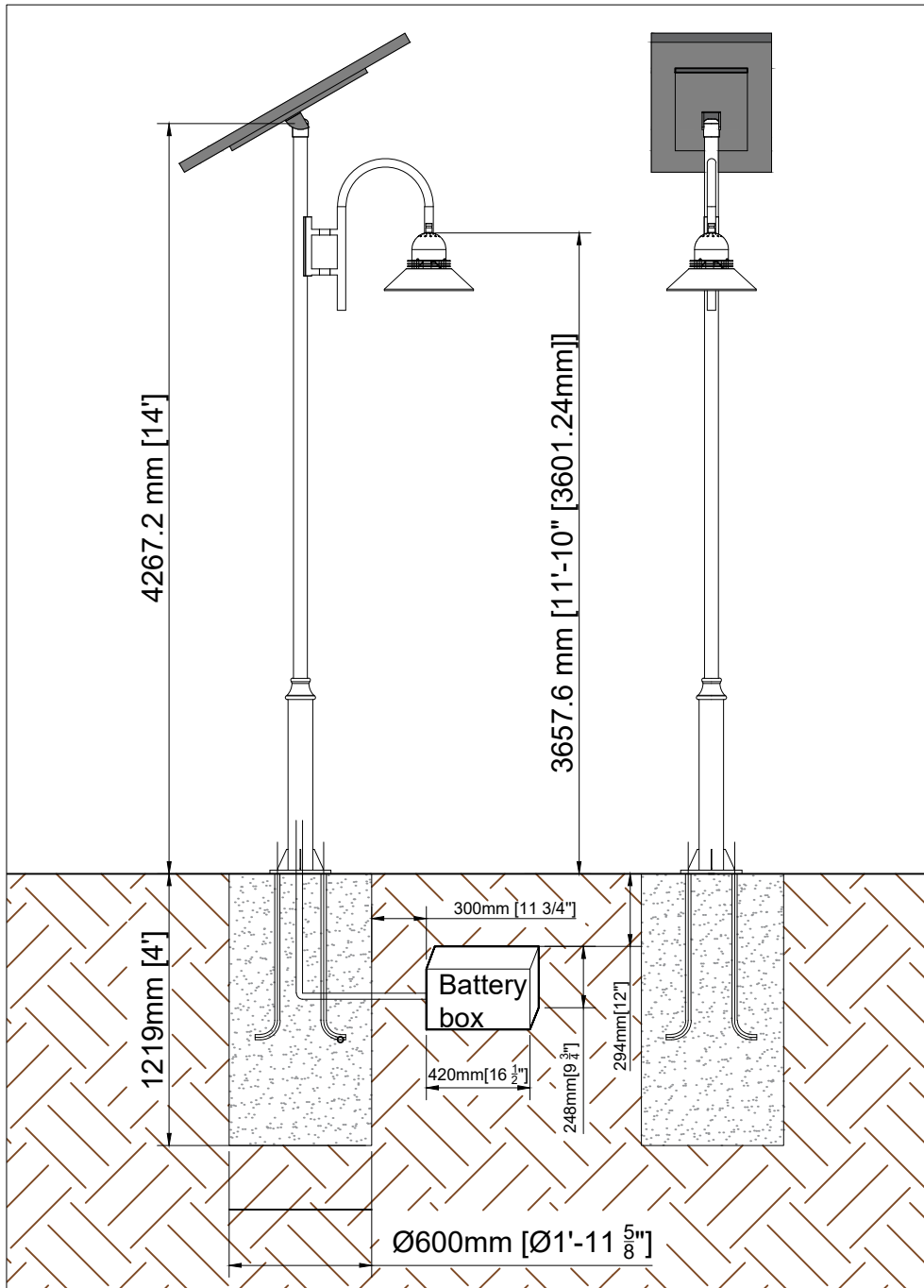
0 - 15h | 0 - 14h

2.5V - 10V

1.5mm<sup>2</sup>/ 1.5mm<sup>2</sup>/ 2.5mm<sup>2</sup>, 15 (AWG)

IP68 (1.5 m, 72 h)





- Foundation dimensions shall be confirmed by a local engineering company, Greenshine New energy will not be held liable for any defect of the concrete foundation due to improper sizing.
- Drawings are based using hot-dipped galvanized steel, powder coating with a thickness of 0.02".
- \*EPA of the system exclude the EPA of the pole, includes the solar panels, brackets, arm and LED fixture and battery box.
- \*\*Wind resistance of the poles are indicative and further customization can be provided.

Tilt angle of the solar panels	15	30	45	60
EPA (ft <sup>2</sup> )*	3.94	7.58	10.76	13.13
Wind resistance** (mph)	100	100	100	100

Proposal	 <b>Greenshine</b>		
System	LITA - 14' POLE - 1 PANEL		
By	Luis Jimenez	Date	12/16/2019
www.streetlights-solar.com			



**Project 1**



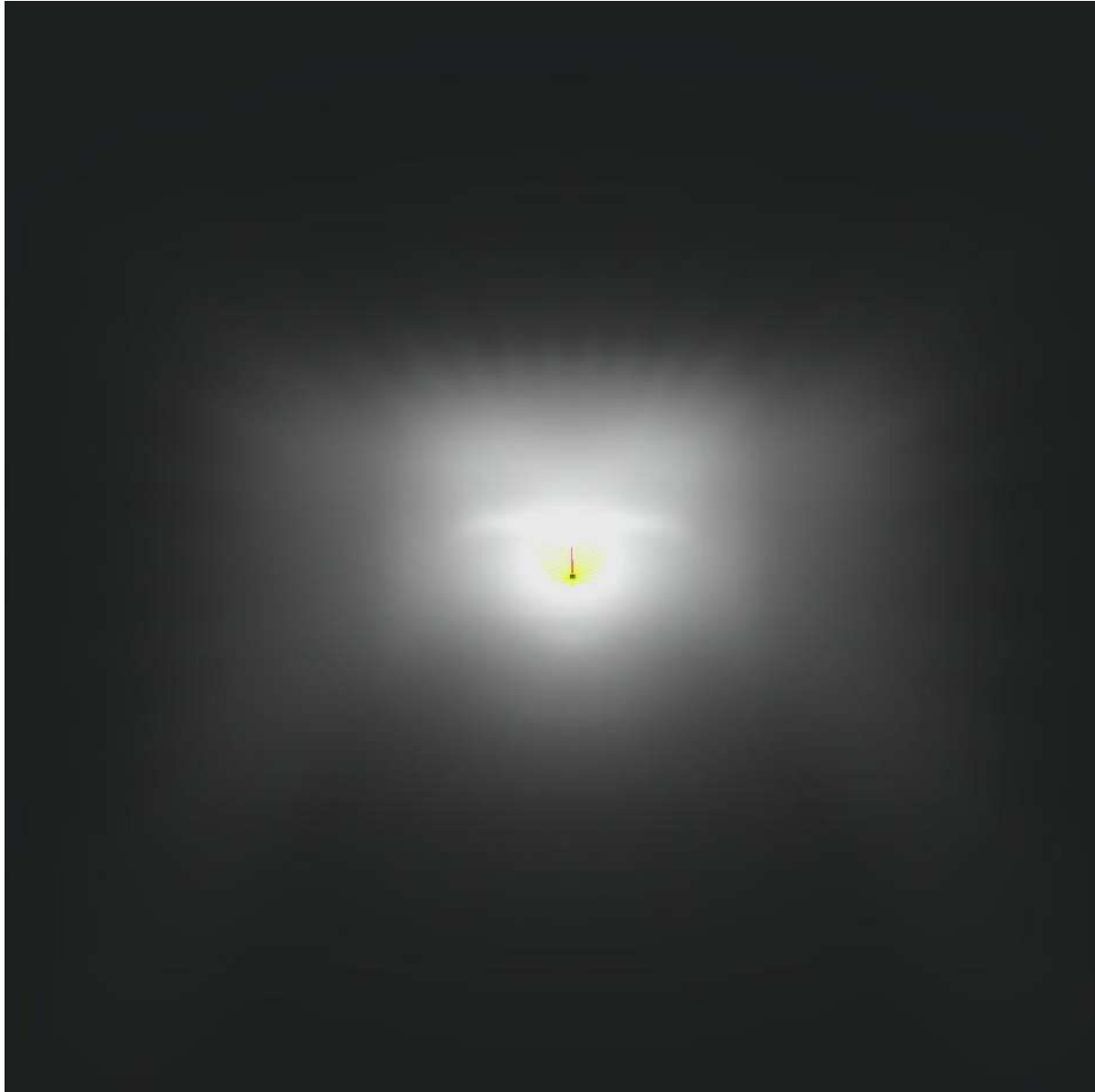
03 / 23 / 2020

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e-Mail [luis.jimenez@streetlights-solar.com](mailto:luis.jimenez@streetlights-solar.com)

**LITA 20W - 14' POLE / 3D Rendering**

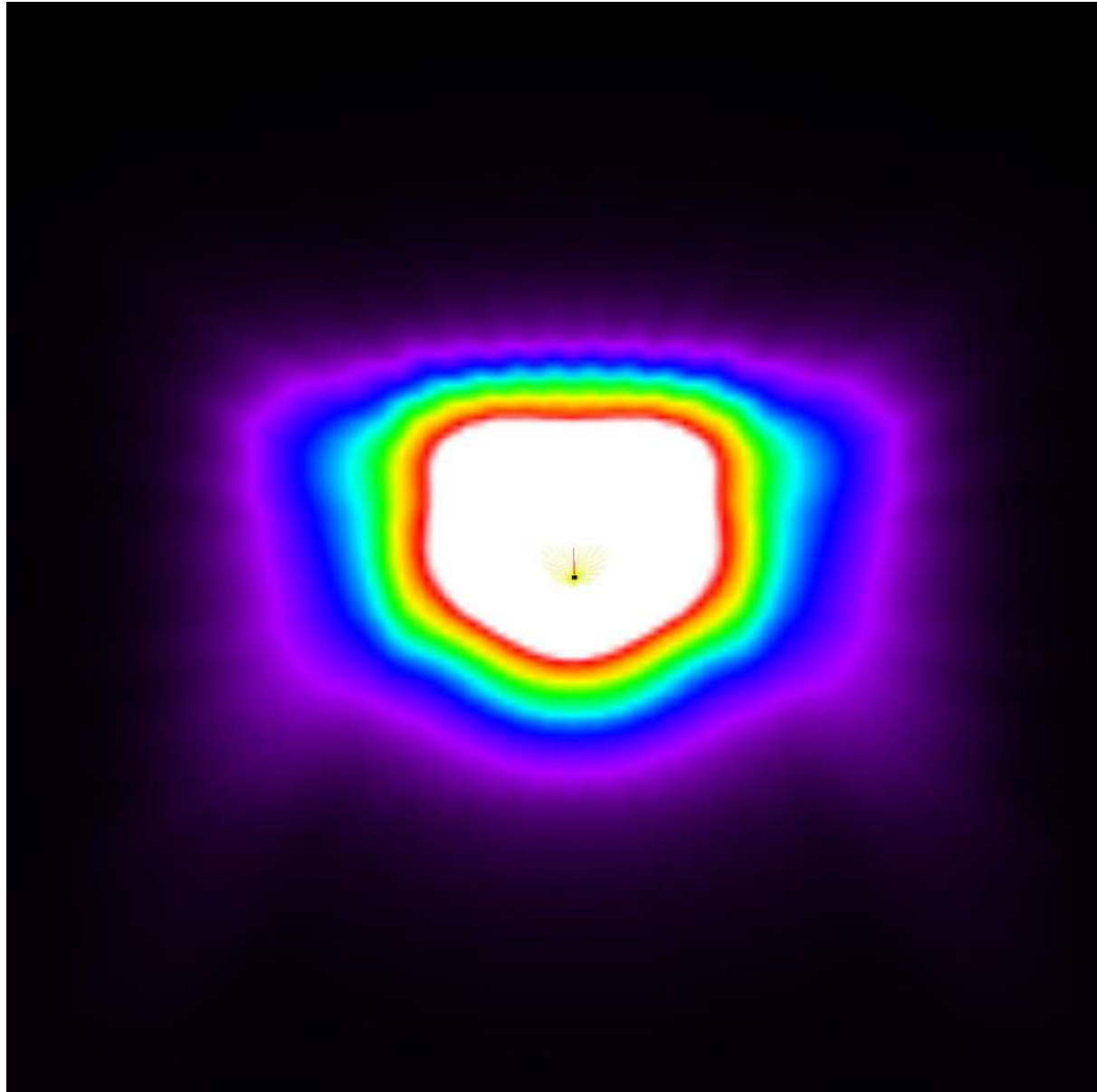




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### LITA 20W - 14' POLE / False Color Rendering

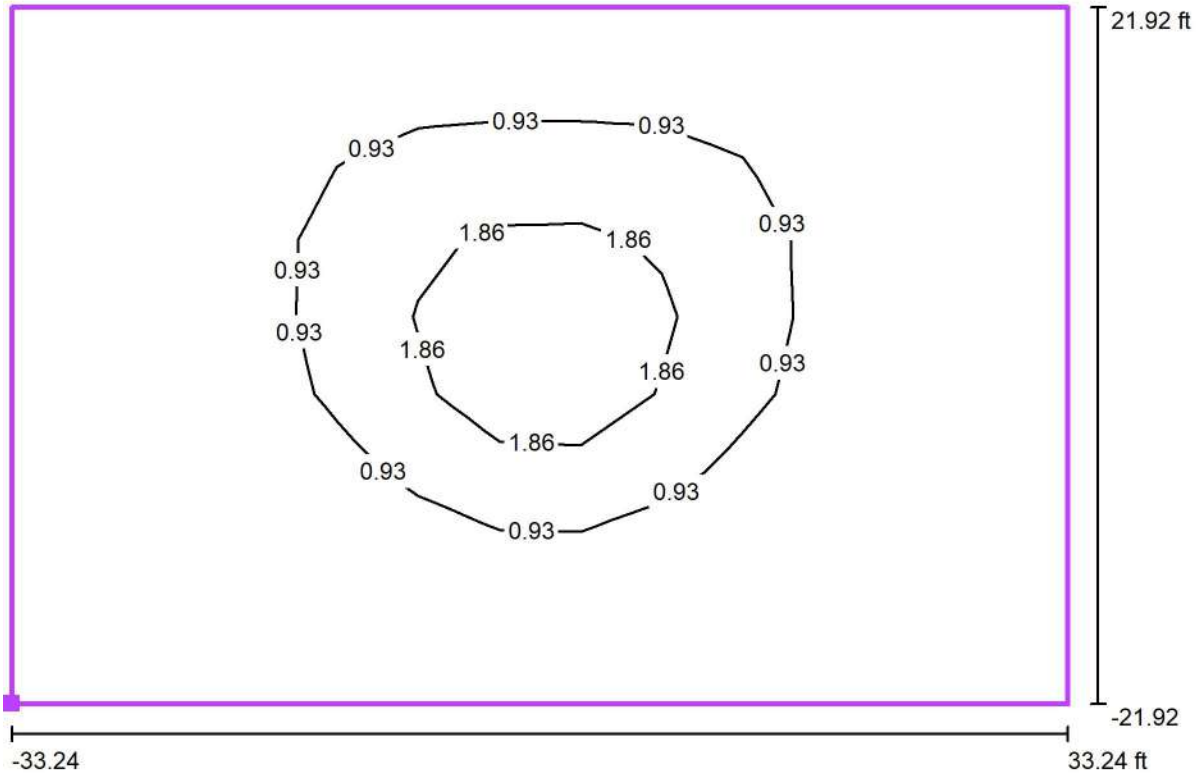


0 0.13 0.25 0.38 0.50 0.63 0.75 0.88 1.00 fc

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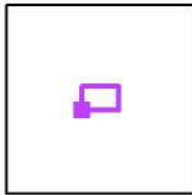
Operator Luis Jimenez  
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### LITA 20W - 14' POLE / Calculation Grid 1 / Isolines (E, Perpendicular)



Values in Footcandles, Scale 1 : 145

Position of surface in external scene:  
Marked point: (138.174 ft, 151.724 ft,  
0.000 ft)



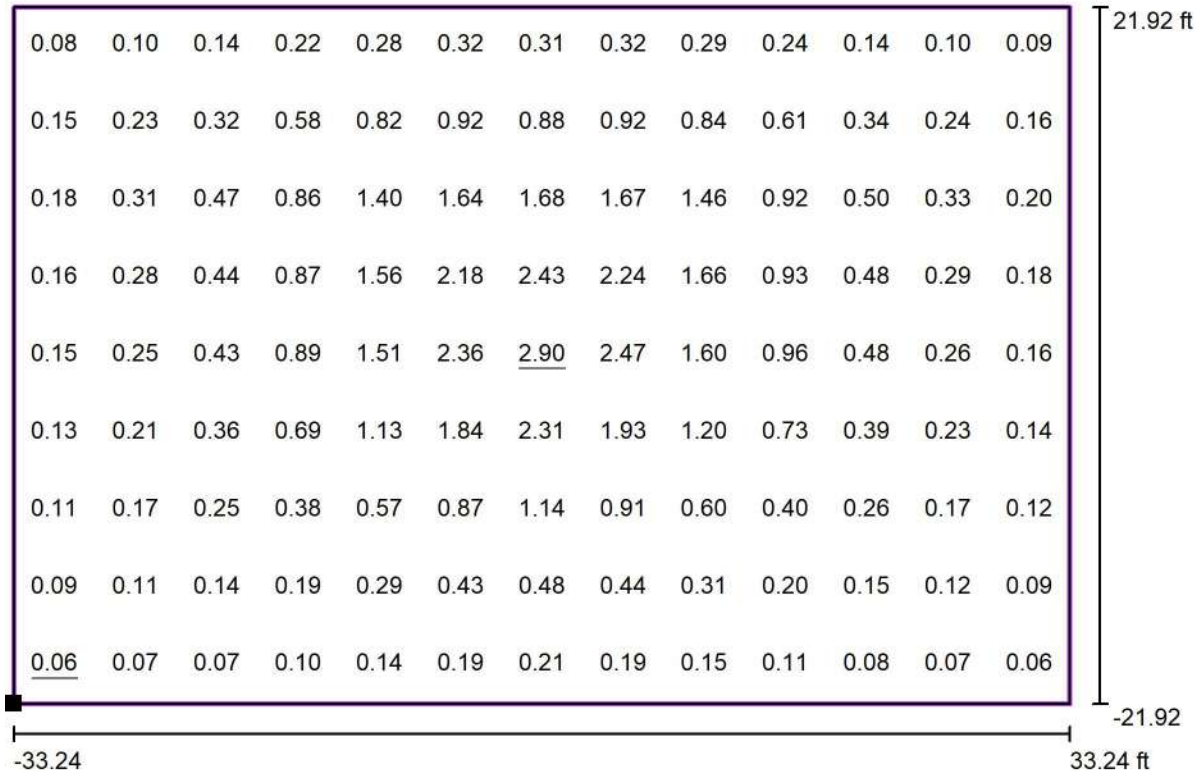
Grid: 13 x 9 Points

$E_{av}$ [fc]	$E_{min}$ [fc]	$E_{max}$ [fc]	u0	$E_{min} / E_{max}$
0.61	0.06	2.90	0.10	0.02

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### LITA 20W - 14' POLE / Calculation Grid 1 / Value Chart (E, Perpendicular)



Values in Footcandles, Scale 1 : 145

Position of surface in external scene:  
 Marked point: (138.174 ft, 151.724 ft,  
 0.000 ft)



Grid: 13 x 9 Points

$E_{av}$  [fc]  
0.61

$E_{min}$  [fc]  
0.06

$E_{max}$  [fc]  
2.90

$u_0$   
0.10

$E_{min} / E_{max}$   
0.02