



Greenshine



VOLTA

NSB PRO

Cost Effective Solar Lighting Solutions

VOLTA | GENERAL SPECIFICATIONS



Greenshine

Light Fixture (GS-LED-NSBP)

| | |
|-------------------------|--------------------|
| Luminaire Input Voltage | DC 12V 24V |
| Power Consumption | 30W 40W |
| Lumen | 3929 5288 lumens |
| Color Temperature | 3000-4000 K |
| IES Lighting Type | Type II III V |
| Material | Die-cast aluminum |



Solar Panel (12 Units)

40W

| | |
|-----------------------|----------|
| Rating Power | 40 W |
| Maximum Power Voltage | 18.92 V |
| Maximum Power Current | 2.12 A |
| Open Circuit Current | 23.65 V |
| Short Circuit Current | 2.26 A |
| Size | 65" x 8" |
| Weight | 11 lb |

Battery (2 Units)

| | |
|-------------------|---|
| Battery Type | GEL Deep Cycle Lead-Acid |
| Operating Voltage | 12 V |
| Capacity | 150 Ah at 20 hr-rate to 1.75 V per cell at 77°F |
| Dimensions | 16(L)×7(W)×9.2(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 | 20 ft |
| Diameter | 7 7/8" at the bottom, 7 7/8" at the top |
| Thickness | 5/32" |
| Material | Galvanized Steel |
| Finishing | Powder Coating |



BRIGHTA | GENERAL SPECIFICATIONS



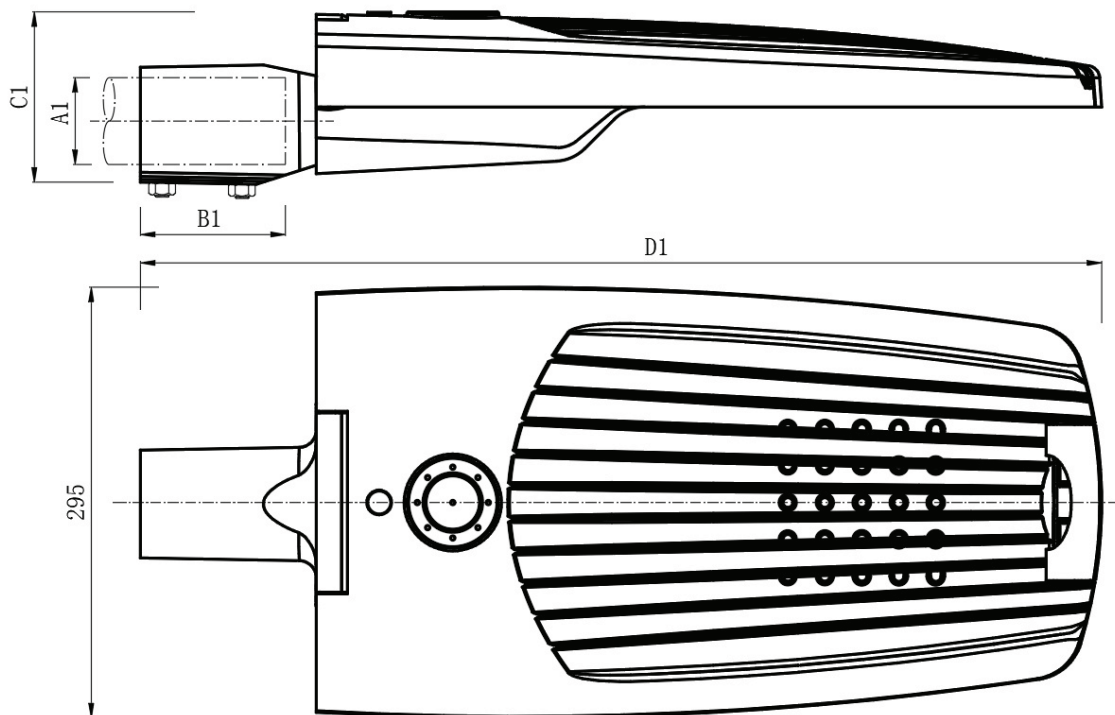
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SPECIFICATIONS

| | |
|-------------------------|---|
| Luminaire Input Voltage | DC 12V 24V |
| Power Consumption | 30W 40W |
| Lumen Output | 3929 5288 lumens |
| Color Temperature | 3000-4000 K |
| IES Lighting Type | Type II III V |
| Material | High pressure die-cast aluminum |
| Lens | 5mm toughened glass, optical grade PMMA |
| IP Class | IP 65 |
| Insulation | Class I |
| Operating Temperature | -30°C ~+50°C / -22°F ~+122°F |
| CRI | ≥70 |

Weight: 8.3 kg | 18.3 lb

DIMENSIONS



| A1 | B1 | C1 | D1 |
|-----|----|-----|-----|
| ∅60 | 90 | 119 | 663 |



Solar panel



8 x 40W

Volta solar wrapped pole consists of 8 x 40W solar panel. The solar panel back frame is anodized with black color finish, ideal for all kinds of outdoor weather condition use.

Each solar panel is with MC4 type connectors, easy to connect.

| | |
|------------------------------|--|
| <u>Rating Power</u> | 40W |
| <u>Production Tolerance</u> | ± 3% |
| <u>Maximum Power Voltage</u> | 18.92 V |
| <u>Maximum Power Current</u> | 2.12 A |
| <u>Open Circuit Voltage</u> | 23.65 V |
| <u>Short Circuit Current</u> | 2.26 A |
| <u>Frame</u> | Anodized aluminum, 4mm thickness |
| <u>Dimensions</u> | 1650mm x 200mm x 40mm 65" x 8" x 1.6" 5Kg / 11lb |
| <u>Test Temperature</u> | 25°C / 77°F, 1000w/m ² , Air Mass 1.5 |
| <u>Junction box / Wiring</u> | IP65 Junction box with 900mm cable with MC4 connectors |



GREENSHINE GEL-TYPE BATTERY

Solar Powered LED Lighting System



Greenshine

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 |
|--|------------|-------------|-------------|-------------|
|--|------------|-------------|-------------|-------------|

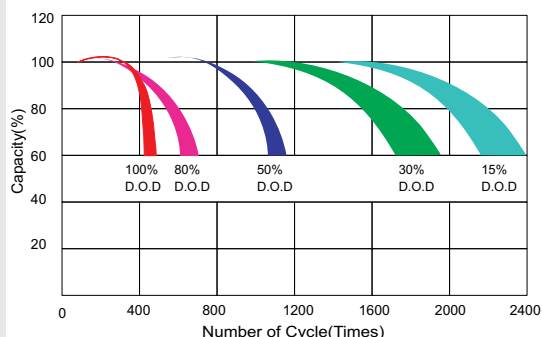
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|-----------------------------------|--|---|---|---|
| Cells per unit | 6 | 6 | 6 | 6 |
| Voltage per unit | 12V | 12V | 12V | 12V |
| Capacity | 80Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F | 120Ah @ 20hr-rate to 1.75V per cell @ 25°C / 77°F | 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) ² |
| 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 | | | |



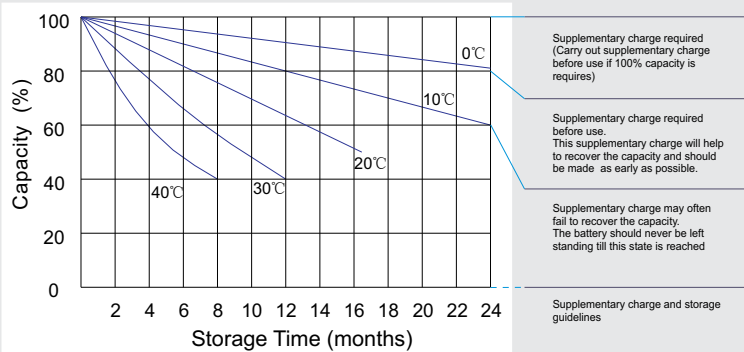
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GREENSHINE GEL-TYPE BATTERY

Life characteristics of cyclic use



Storage characteristic



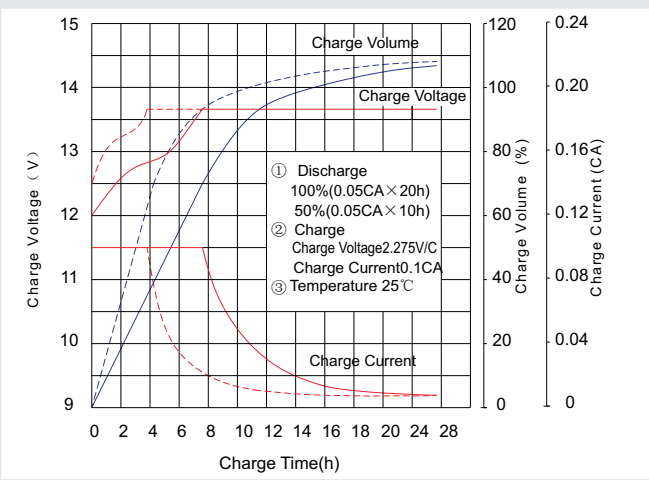
Supplementary charge required before use if 100% capacity is required

Supplementary charge required before use. This supplementary charge will help to recover the capacity and should be made as early as possible.

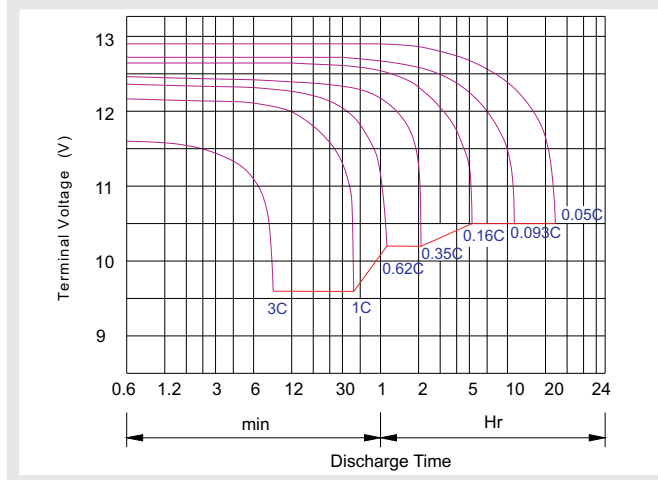
Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this state is reached

Supplementary charge and storage guidelines

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. |

GREENSHINE CONTROLLER

Solar Powered LED Lighting System



Greenshine

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)

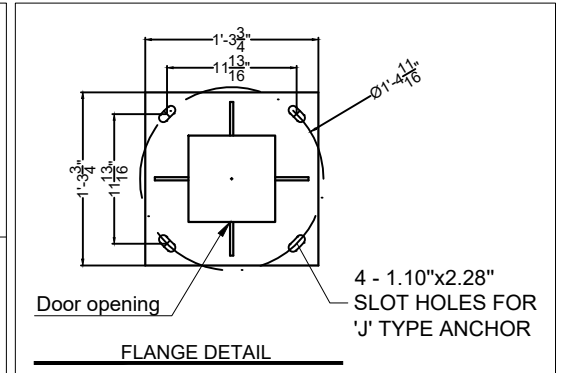
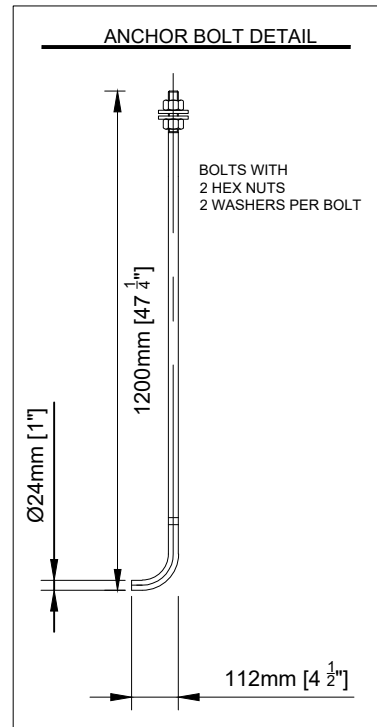
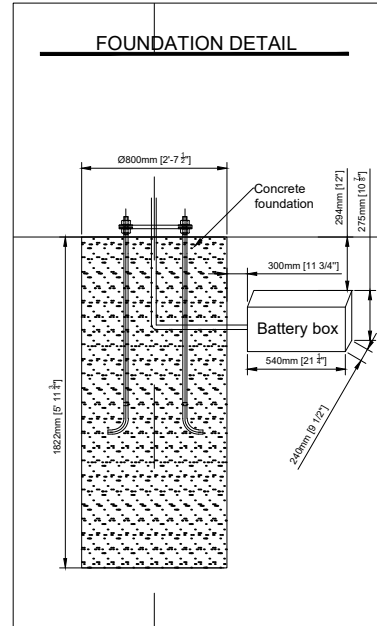
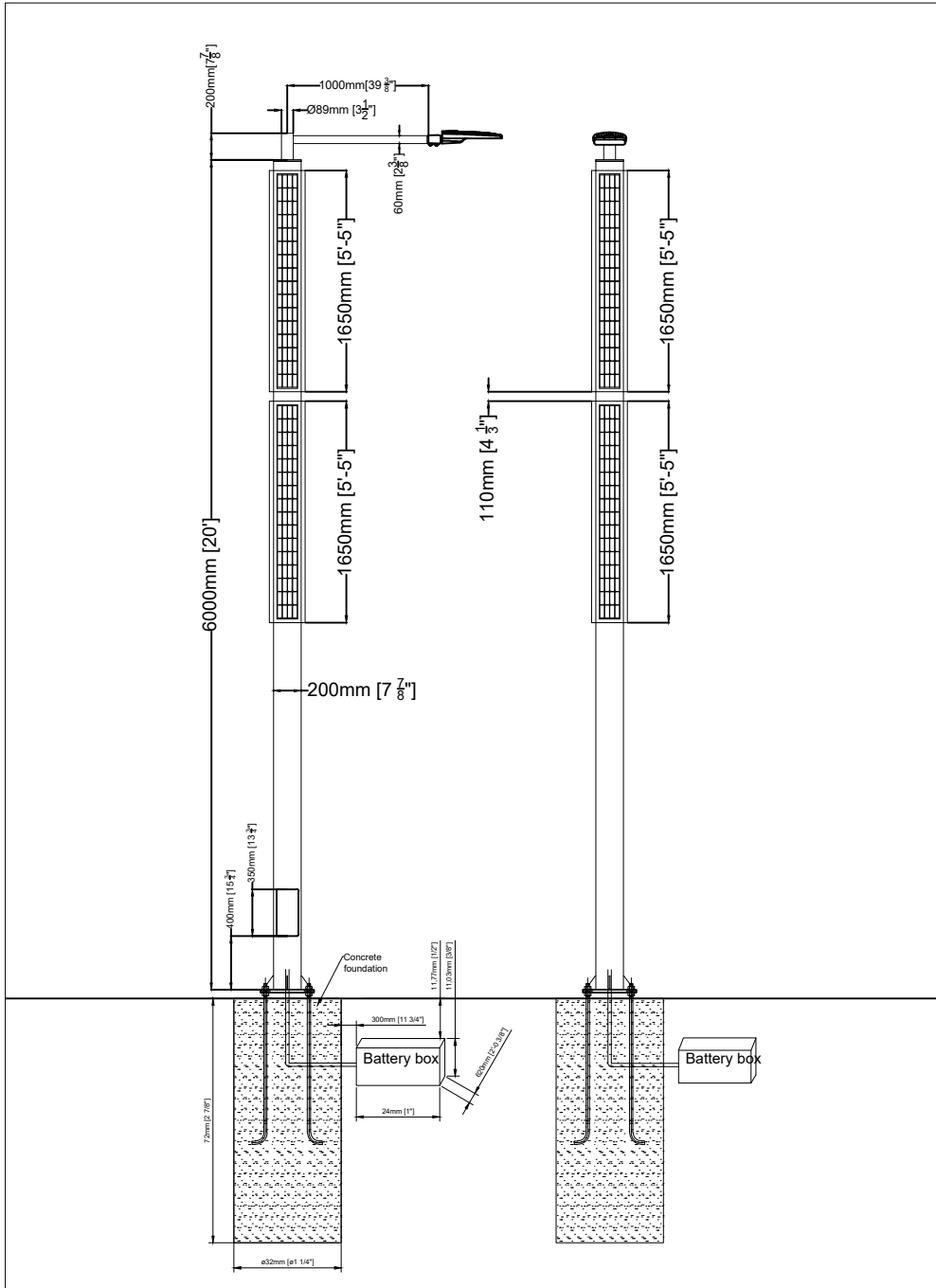
0 - 15h | 0 - 14h

2.5V - 10V

1.5mm²/ 1.5mm²/ 2.5mm², 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 0.020".
- *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.

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|----------------------------|--|------|-----------|--|
| Proposal |  | | | |
| System | GS-LED-NSBP - 20' pole - 8 panels | | | |
| By | Luis Jimenez | Date | 4/19/2019 | |
| www.streetlights-solar.com | | | | |

Project 1



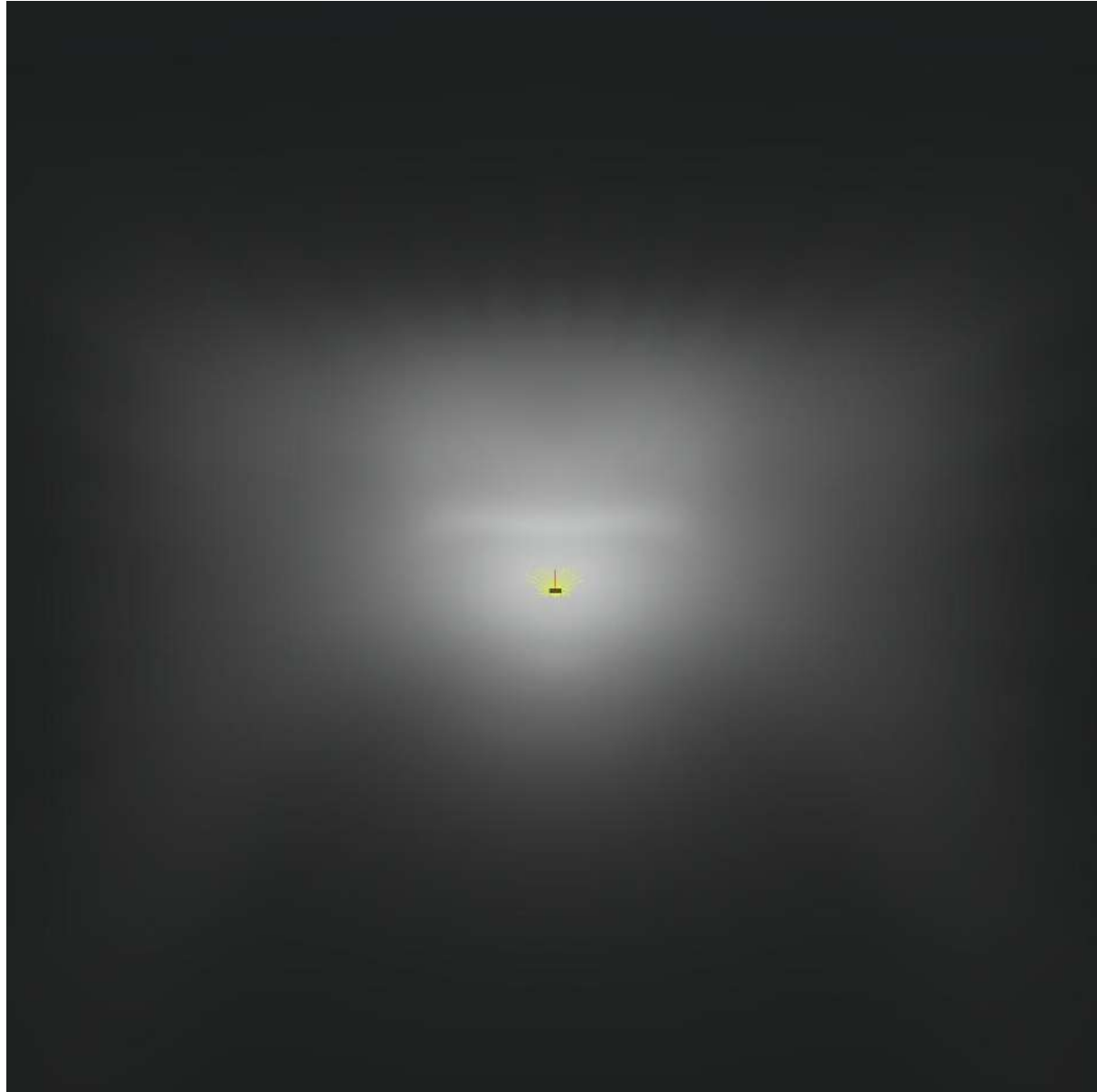
03 / 23 / 2020

Greenshine New Energy

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VOLTA 30W - 20' POLE / 3D Rendering

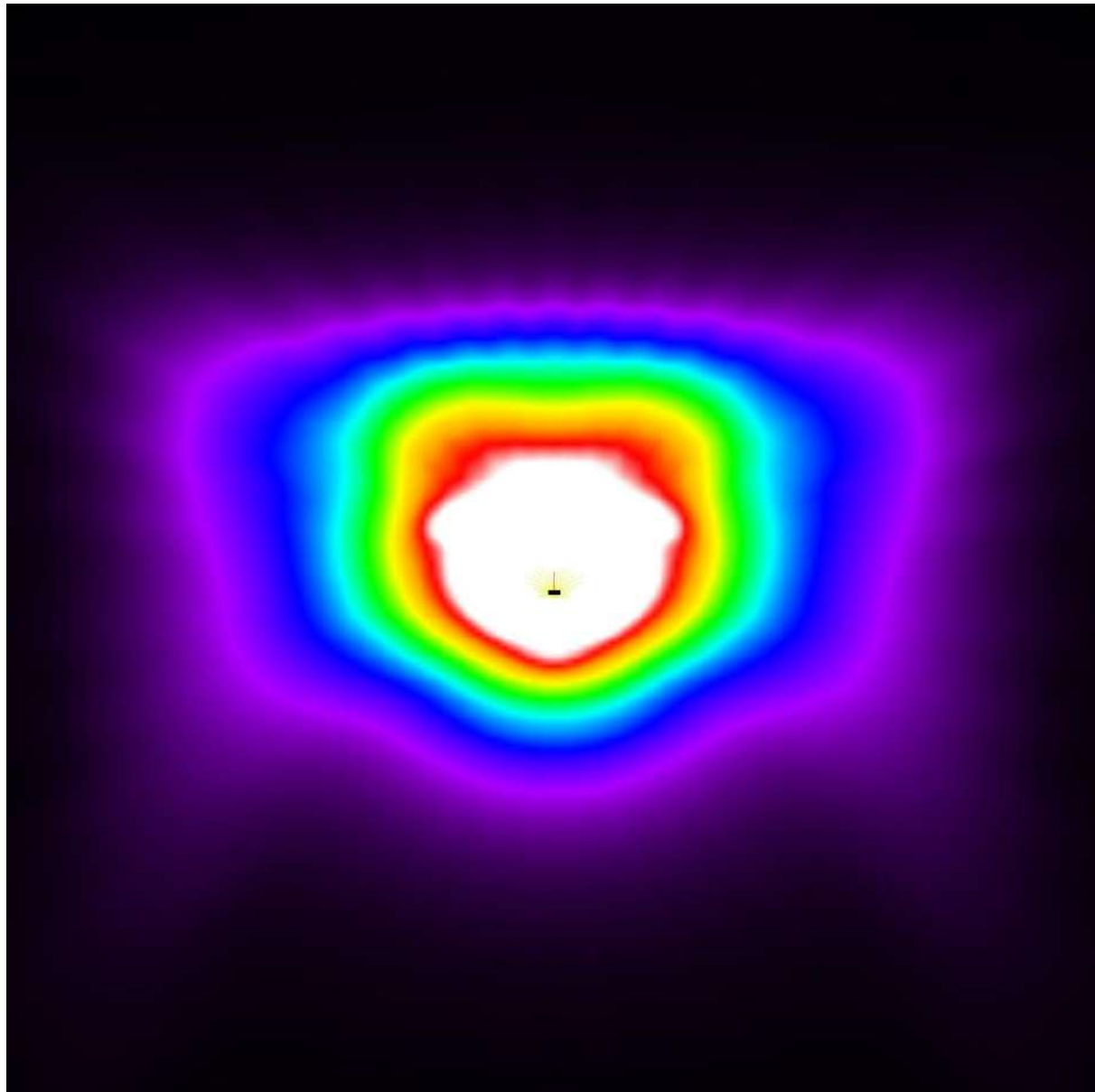




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VOLTA 30W - 20' POLE / False Color Rendering

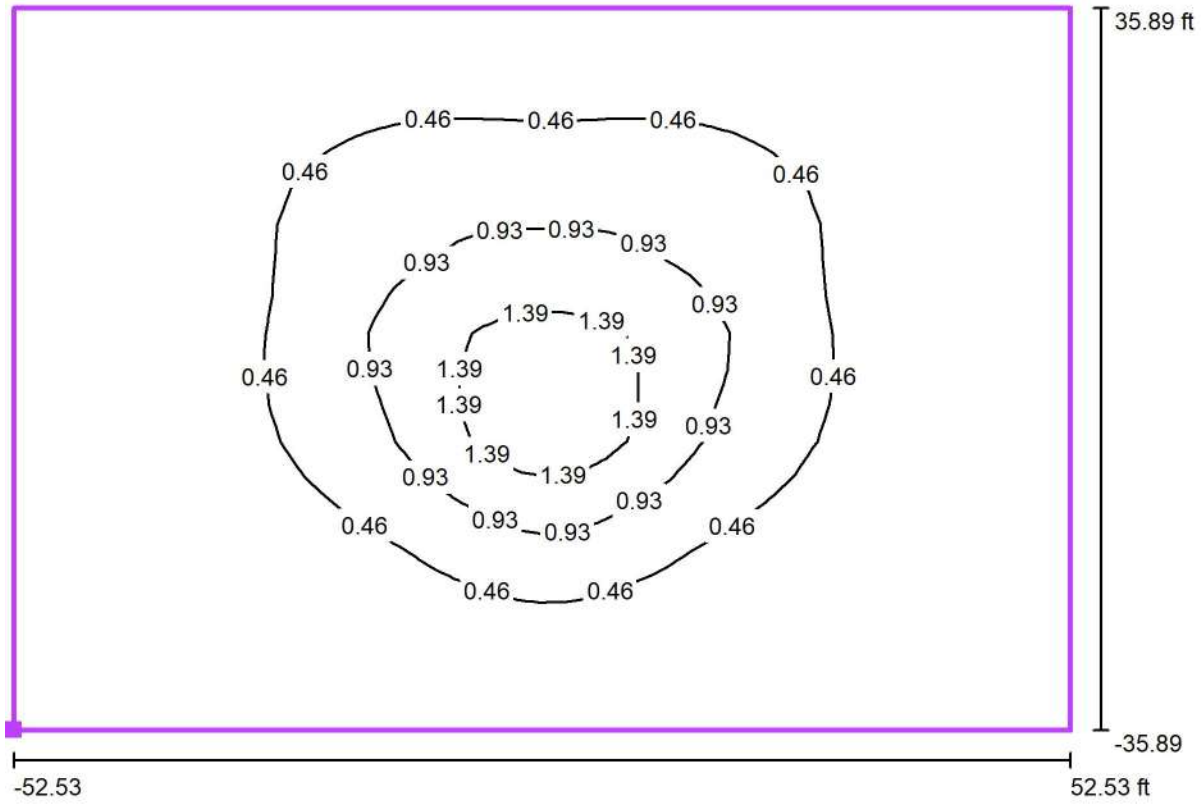


0 0.13 0.25 0.38 0.50 0.63 0.75 0.88 1.00 fc

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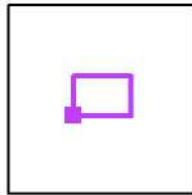
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VOLTA 30W - 20' POLE / Calculation Grid 1 / Isolines (E, Perpendicular)



Values in Footcandles, Scale 1 : 229

Position of surface in external scene:
 Marked point: (118.535 ft, 142.055 ft,
 0.000 ft)



Grid: 50 x 20 Points

E_{av} [fc]
 0.41

E_{min} [fc]
 0.05

E_{max} [fc]
 1.75

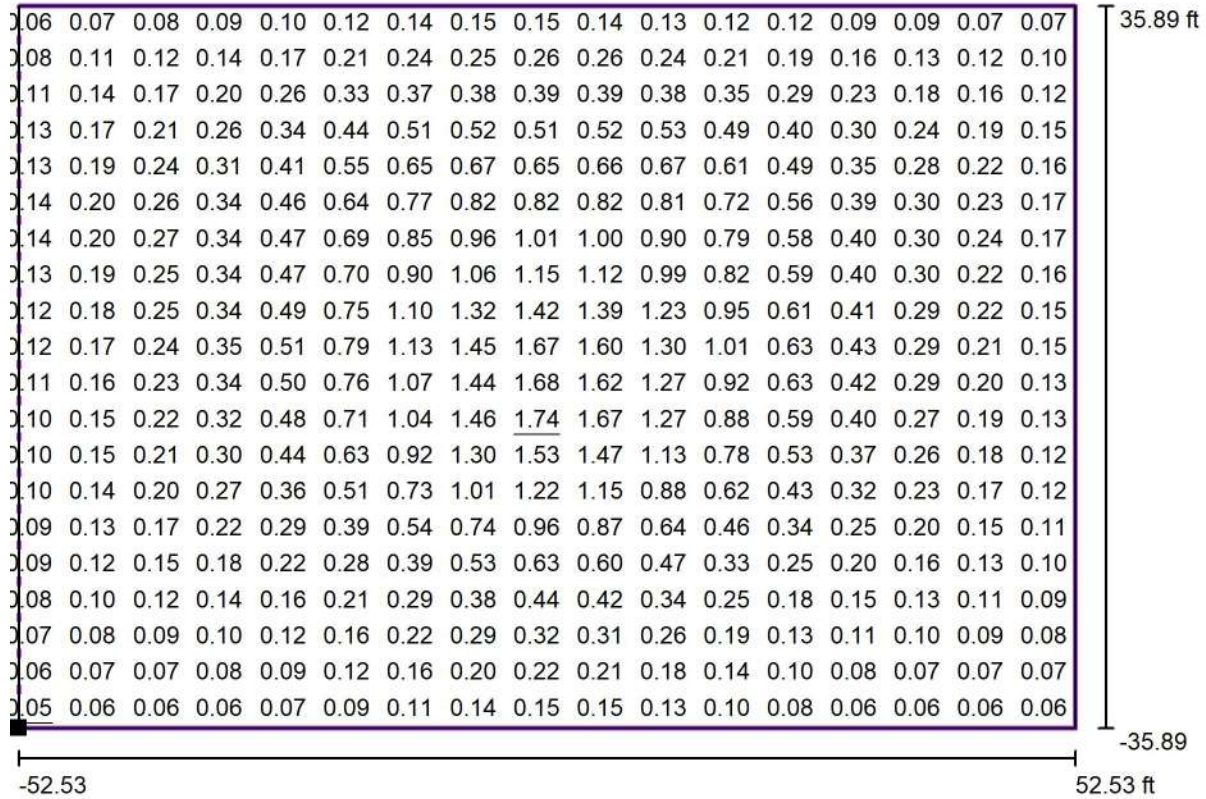
u_0
 0.13

E_{min} / E_{max}
 0.03

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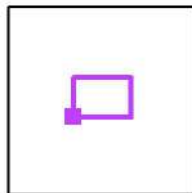
VOLTA 30W - 20' POLE / Calculation Grid 1 / Value Chart (E, Perpendicular)



Values in Footcandles, Scale 1 : 229

Not all calculated values could be displayed.

Position of surface in external scene:
 Marked point: (118.535 ft, 142.055 ft,
 0.000 ft)



Grid: 50 x 20 Points

| | | | | |
|---------------|----------------|----------------|------|---------------------|
| E_{av} [fc] | E_{min} [fc] | E_{max} [fc] | u0 | E_{min} / E_{max} |
| 0.41 | 0.05 | 1.75 | 0.13 | 0.03 |