



**SECTION G**

**SAMPLE LIGHTING DESIGNS**

**GLEN HELEN  
LIGHTING PROJECT**

**FOR**

**SAN BERNARDINO, CALIFORNIA**

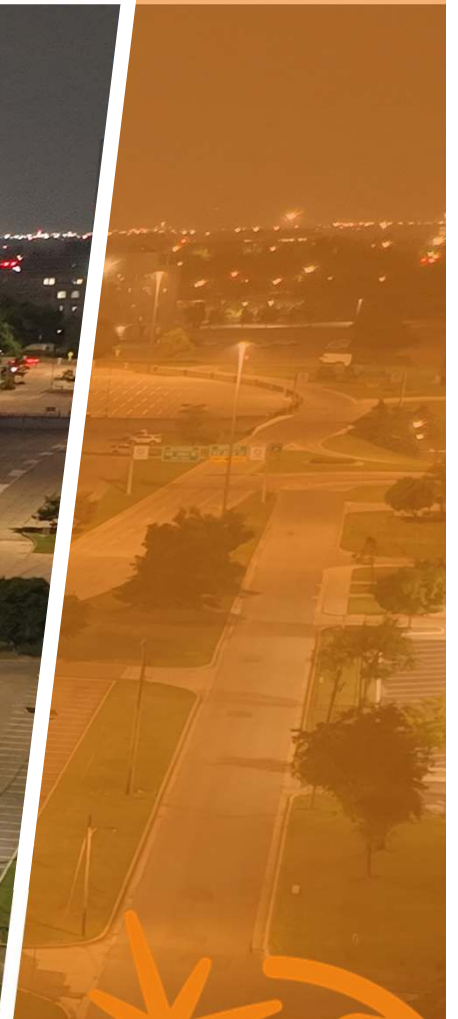
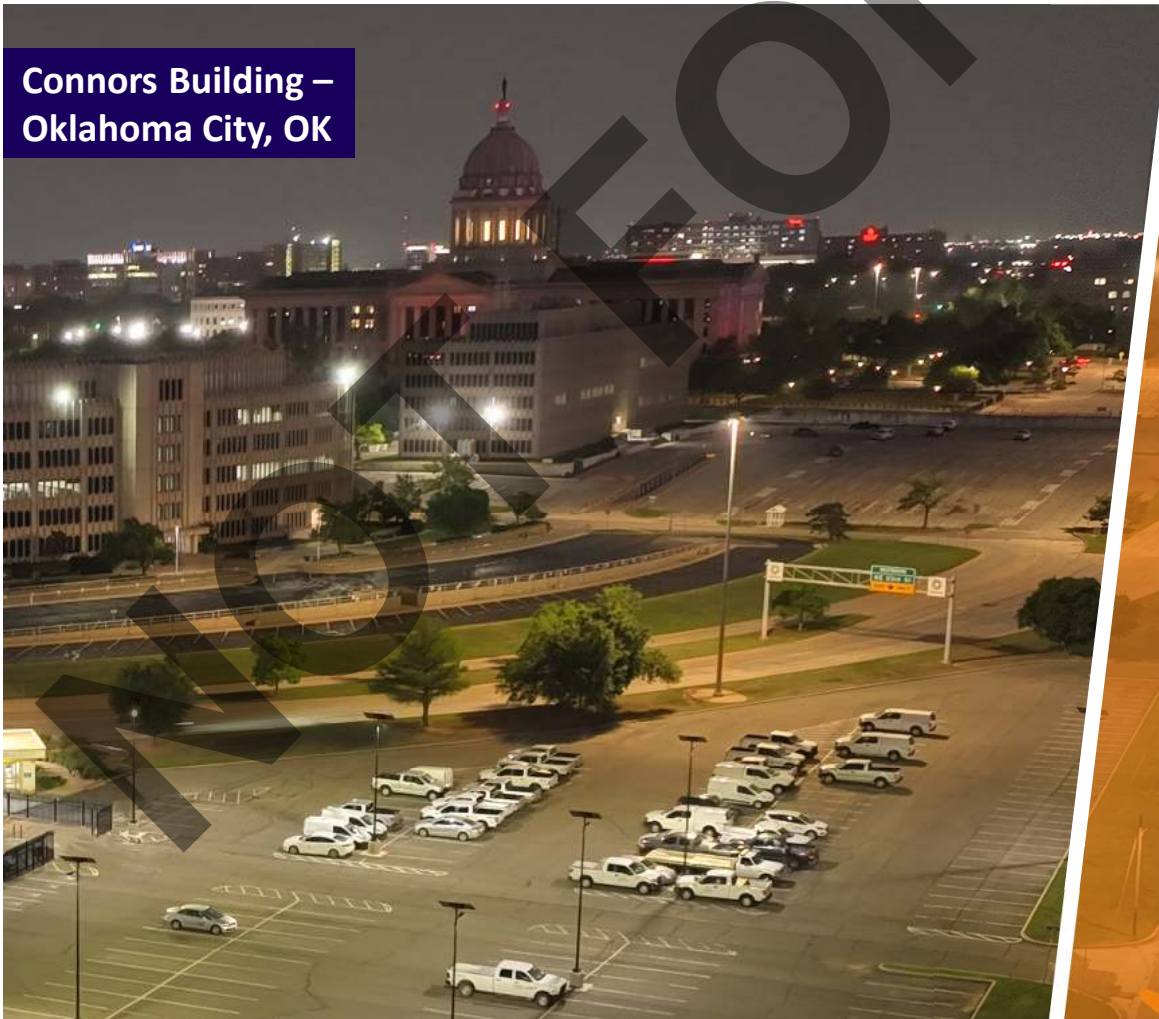
**PROJECT NO.: 30.30.0146**

**NOT FOR BID**

# APPLICATION DESIGN

## Glen Helen Main San Bernardino, CA

Connors Building –  
Oklahoma City, OK



Project Number:	<u>G6350</u>
Date:	7/27/2023
Written by:	Michael ZERMANI
Version :	C



# The global leader in solar lighting

Fonroche Lighting America is proud to be part of Fonroche Lighting, the global leader in off-grid solar street lighting. The deep resources and broader scope of an established market leader lets us take solar lighting even further, from the State Treasury in Salem, Oregon to the West African Republic of Senegal. Over 150,000 Fonroche SmartLight systems have been deployed worldwide.

With five offices in the USA and installations across the country, Fonroche is never far away. Some solution providers enter the solar lighting market—then move on. We're a reliable partner that sticks around. You get the responsive support and smart answers that you need now—and the confidence that we'll be here for you far in the future. And we can take on projects of any size, from local to national. That's why so many municipalities, military and federal facilities, tribes, commercial properties, and developers trust us to deliver the full promise of solar lighting.



**Olton City Park – Olton, TX**

## The 3 key benefits for your project

### - OFF-GRID

100% solar, not connected to the utility grid. No outages.

**365 nights of light a year – guaranteed.**

### - POWERFUL

Powerful illumination, on a par with grid-connected systems.

### - COST-EFFICIENT

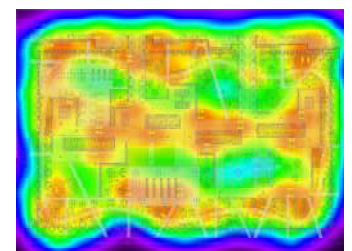
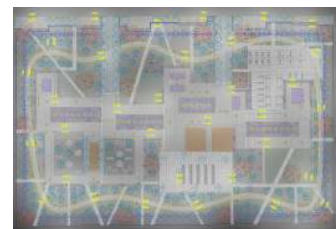
No maintenance for the first 10 years. Rapid installation. No operating costs.

## Feasibility of your solar lighting project

To guarantee powerful, cost-effective off-grid lighting, Fonroche operates its own **design offices**.

We assess the feasibility of each project in four stages:

- 1.** First, we define your **lighting requirements**.
- 2.** Next, we analyze the last 10 years of **local weather data** to determine how much energy our PV panels will generate.
- 3.** On this basis, we **calculate** what size and how many products we need to install.
- 4.** Finally, our sales team draws up a **cost estimate**.



1 Project = 1 Study



1



### 10-Year Analysis of local weather data

We use the **PVsyst** software suite and **Meteonorm** historical time series irradiation data to calculate the real-world operating conditions — orientation and tilt angle of the panel, shadow, etc. — and external parameters, such as direct and diffuse irradiation, temperature and the solar calendar.

2



### Simulation of product(s) over a typical year

Our teams have developed a solar sizing software application, which we use to determine which products will best meet your needs. We then simulate how these products operate over a typical year, based on the average conditions for **the last decade**.

3



### Sizing the project to your needs

We use a set of key criteria to optimally specify your project:

- Average battery charge level over the year
- Minimum charge level
- Comparative analysis of energy generated by the panel vs. energy used by the system
- Worst-case scenario (lowest irradiation, longest night)

4



### Results

Based on our experience, we propose the **optimal solution** in terms of lighting performance and cost effectiveness.

Autonomy of  
**365**  
nights of lighting /year

## Your Project location



**San Bernadino, CA**

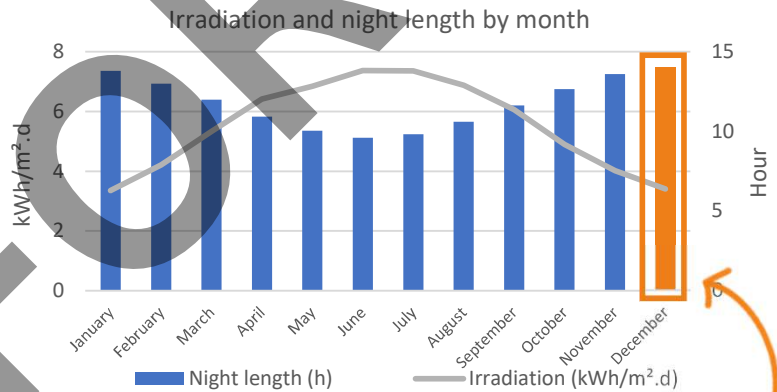
**USA**

### GPS COORDINATES

Latitude: 34.1083  
Longitude: -117.2898

## Your Solar Potential

We have analyzed the weather data for the last 10 years at your project location so that we can guarantee constant lighting every night of the year.



Average annual irradiation : 5.52kWh/m<sup>2</sup>.d

*Sizing takes account of the month with the lowest irradiation and the longest night.*

## Your Lighting Application



Facility parking & road

### Compliance with public lighting standards

Your project has been designed in compliance with:  
- AASHTO standard



## SMARTLIGHT SYSTEM CONFIGURATION – Parking Singles



Non pro-rated

### Project-Specific System Specifications

#### PHOTOVOLTAIC MODULE



PV panel power rating 1 x 310 Wp

PV panel tilt angle 10°

#### POWER 365: SMART STORAGE AND MANAGEMENT



Battery capacity (Must be NiMH) 1 x 1248 Wh

#### LED LIGHT UNIT



Lighting power 1 x 40 W nominal

LED light unit specification 4000K – 180-190 Lm/w

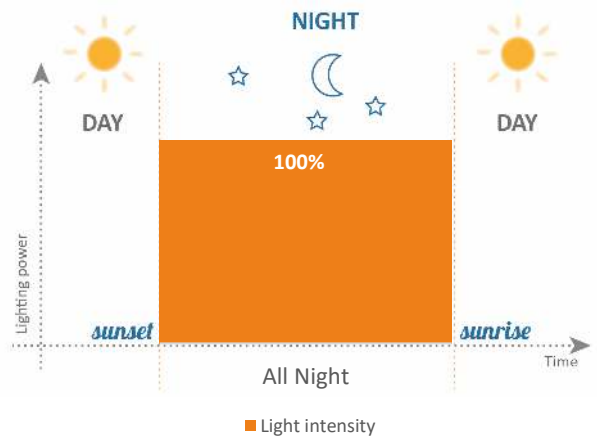
#### POLE & CROSSPIECE

Pole height 25'

Protective treatment Powder Coated



### Chosen lighting profile for your project



## SMARTLIGHT SYSTEM CONFIGURATION – Parking Doubles



Non pro-rated

### Project-Specific System Specifications

#### PHOTOVOLTAIC MODULE



PV panel power rating 2 x 310 Wp

PV panel tilt angle 10°

#### POWER 365: SMART STORAGE AND MANAGEMENT



Battery capacity (Must be NiMH) 2 x 1248 Wh

#### LED LIGHT UNIT



Lighting power 2 x 40 W nominal

LED light unit specification 4000K – 180 Lm/w

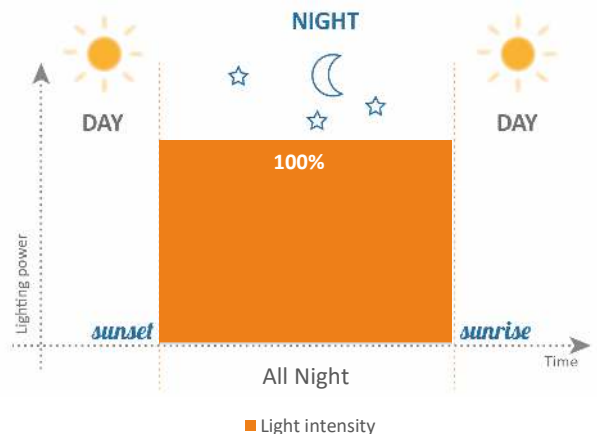
#### POLE & CROSSPIECE

Pole height 25'

Protective treatment Powder Coated



Chosen lighting profile for your project



## SMARTLIGHT SYSTEM CONFIGURATION – Access Road/2-Lane Entrance Single



Non pro-rated

### Project-Specific System Specifications

#### PHOTOVOLTAIC MODULE



PV panel power rating 1 x 270 Wp

PV panel tilt angle 10°

#### POWER 365: SMART STORAGE AND MANAGEMENT



Battery capacity (Must be NiMH) 1 x 936 Wh

#### LED LIGHT UNIT



Lighting power 1 x 30 W nominal

LED light unit specification 4000K – 190 Lm/w

#### POLE & CROSSPIECE

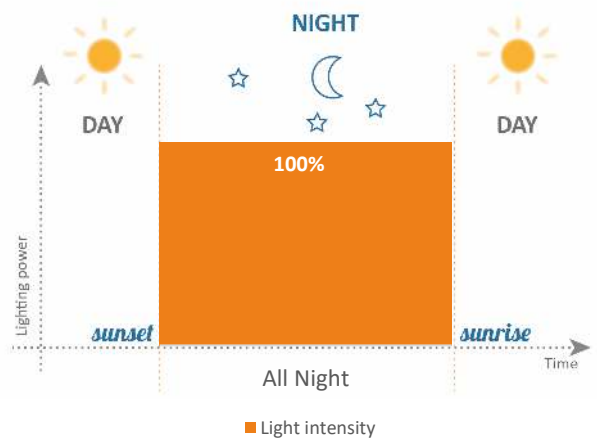
Pole height 25'

Protective treatment Powder Coated

POWER 365  
Ultimate Solar Lighting TECHNOLOGY BY FONROCHE



Chosen lighting profile for your project





# SMARTLIGHT SYSTEM CONFIGURATION – 1-Lane Entrance Single



Non pro-rated

## Project-Specific System Specifications

### PHOTOVOLTAIC MODULE



PV panel power rating 1 x 310 Wp

PV panel tilt angle 10°

### POWER 365: SMART STORAGE AND MANAGEMENT



Battery capacity (Must be NiMH) 1 x 1248 Wh

### LED LIGHT UNIT



Lighting power 1 x 40 W nominal

LED light unit specification 4000K – 180 Lm/w

### POLE & CROSSPIECE

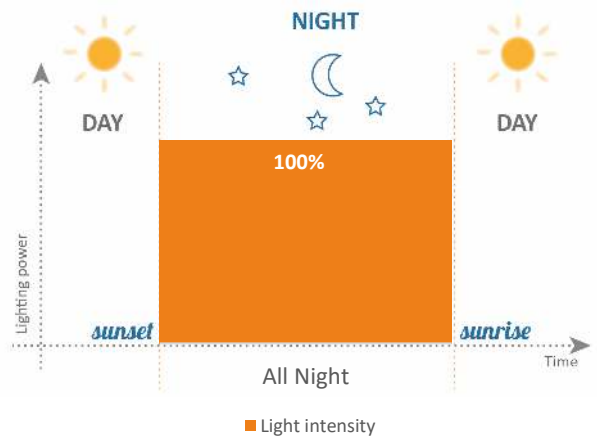
Pole height 25'

Protective treatment Powder Coated

POWER 365  
Ultimate Solar Lighting TECHNOLOGY BY FONROCHE



Chosen lighting profile for your project



## SMARTLIGHT SYSTEM CONFIGURATION – Access Road Twin



Non pro-rated

### Project-Specific System Specifications

#### PHOTOVOLTAIC MODULE



PV panel power rating 1 x 310 Wp

PV panel tilt angle 10°

#### POWER 365: SMART STORAGE AND MANAGEMENT



Battery capacity (Must be NiMH) 1 x 1248 Wh

#### LED LIGHT UNIT



Lighting power 2 x 20 W nominal

LED light unit specification 4000K – 180-190 Lm/w

#### POLE & CROSSPIECE

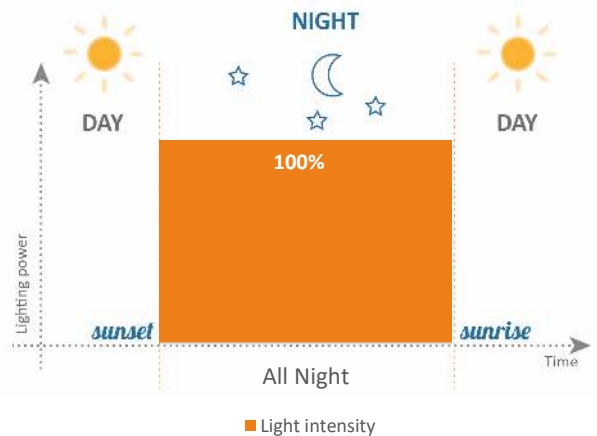
Pole height 25'

Protective treatment Powder Coated

**POWER 365**  
Ultimate Solar Lighting TECHNOLOGY BY FONROCHE



Chosen lighting profile for your project



# Photometric survey results

Zone	Average lighting level (fc)	Uniformity (Avg/Min)	Qty 1 x 30W	Qty 1 x 40W	Qty 2 x 20W	Qty 2 x 40W
Lot 1	1.00	3.33	0	15	0	0
Lot 2	1.01	2.53	0	8	0	0
Lot 3	1.07	3.57	0	8	0	0
Lot 4	1.01	2.53	0	19	0	0
Lot 5	1.11	3.70	0	2	0	13
Roads	0.69	3.45	42	2	1	0
<b>TOTAL</b>			42	54	1	13

## Photometric Targets: AASHTO 2018

Interior Roadways:  $\geq 0.6$  fc avg, Average/Minimum Uniformity Ratio  $\leq 4:1$

Parking Areas:  $\geq 1.0$  fc avg, Average/Minimum Uniformity Ratio  $\leq 4:1$

## Eco-friendly lighting

*Choose Fonroche — and we will reduce your environmental footprint.*

*A standard streetlight consumes in average 80 W during 4200 h per year which represents 0.08x4200 x number of solar streetlight = X kWh of energy saving.*

Once installed, solar lighting reduces

**CO<sub>2</sub> emissions by 1kWh = 0.99 lbs CO<sub>2</sub>**  
 compared to a grid-connected installation. (<https://www.eia.gov/>)

## Recycling our components

Long product service life and component recyclability are key aspects of Fonroche Lighting’s environmental commitments. Our solar streetlights are over 90% recyclable.

Unlike lead-acid batteries, **NiMH batteries** do not contain any toxic chemicals. They are 98% recyclable — the nickel is extracted and used to make various materials, mostly stainless steel.

The **solar panels** have an extremely long service life. Even after 25 years, they will still be producing at least 80% of their initial peak power. So they can continue to be used. Alternatively, about 96% of their component materials can be recycled to make new panels.

# PHOTOMETRIC STUDY

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*\*Note: these results are only valid if the Smartlight PV panel is at an azimuth angle of zero degrees and is completely free of shadow.*

*\*\*These results are subject to change due to technological or regulatory advances. This technical report is valid for 60 days from the date you receive it.*

# Glen Helen - Main



Lighting Plan Rev C

Project Number: G6350

By: Michael Zermani  
 michael.zermani@fonroche.us  
 Date: 7/27/2023

10F Roessler Road  
 Woburn, MA 01801  
 Phone Number: (339) 225 4530  
 www.fonrochesolarlighting.com

## Luminaire Schedule

Symbol	Qty	Label	Description	Lumens	LLF
	13	T4-CK16B-4000K-Double37W-3ft	YTR215964	6660	0.900
	50	T4-CK16B-4000K-Single37W-3ft	YTR215964	6660	0.900
	42	T2-CK16B-4000K-Single28W	YTR215925	5320	0.900
	2	T2-CK16B-4000K-Single37W-3ft	YTR215925	7030	0.900
	1	T4-CK16B-4000K-Twin18W	YTR215964	3240	0.900
	2	T4-CK16B-4000K-Single37W	YTR215964	6660	0.900

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
1	T2-CK16B-4000K-Single28W	2204	1041	26.67	157	0
2	T2-CK16B-4000K-Single28W	1634.419	304.153	26.67	90	0
3	T2-CK16B-4000K-Single28W	1380.052	393.406	26.67	41	0
4	T2-CK16B-4000K-Single28W	1213.762	628.35	26.67	30	0
5	T2-CK16B-4000K-Single28W	1195.831	755.119	26.67	194	0
6	T2-CK16B-4000K-Single28W	1093.94	1021.419	26.67	213	0
7	T2-CK16B-4000K-Single28W	923	1202	26.67	198	0
8	T2-CK16B-4000K-Single28W	806	1466	26.67	216	0
9	T2-CK16B-4000K-Single28W	624	1027	26.67	187	0
10	T2-CK16B-4000K-Single37W-3ft	1221	2461	29.67	252	0
11	T4-CK16B-4000K-Single37W-3ft	1321	2430	29.67	240	0
12	T4-CK16B-4000K-Single37W-3ft	1278	2359	29.67	61	0
13	T4-CK16B-4000K-Single37W-3ft	1357	2306	29.67	61	0
14	T4-CK16B-4000K-Single37W-3ft	1400	2377	29.67	240	0
15	T4-CK16B-4000K-Single37W-3ft	1449	2266	29.67	61	0
16	T4-CK16B-4000K-Single37W-3ft	1492	2337	29.67	240	0
17	T4-CK16B-4000K-Single37W-3ft	1540	2223	29.67	61	0
18	T4-CK16B-4000K-Single37W-3ft	1583	2294	29.67	240	0
19	T4-CK16B-4000K-Single37W-3ft	1624	2171	29.67	61	0
20	T4-CK16B-4000K-Single37W-3ft	1667	2242	29.67	240	0
21	T4-CK16B-4000K-Single37W-3ft	1707	2125	29.67	59	0
22	T4-CK16B-4000K-Single37W-3ft	1729	2237	29.67	330	0
23	T4-CK16B-4000K-Single37W-3ft	1850	2160	29.67	150	0
24	T4-CK16B-4000K-Single37W-3ft	1782	2076	29.67	59	0
25	T4-CK16B-4000K-Single37W-3ft	1003	2187	29.67	243	0
26	T4-CK16B-4000K-Single37W-3ft	1096	2160	29.67	243	0
27	T4-CK16B-4000K-Single37W-3ft	1057	2088	29.67	64	0
28	T4-CK16B-4000K-Single37W-3ft	1188	2126	29.67	243	0
29	T4-CK16B-4000K-Single37W-3ft	1149	2054	29.67	64	0
30	T4-CK16B-4000K-Single37W-3ft	1321	2108	29.67	271	0
31	T4-CK16B-4000K-Single37W-3ft	1243	2019	29.67	74	0
32	T4-CK16B-4000K-Single37W-3ft	1322	2012	29.67	90	0
33	T4-CK16B-4000K-Single37W-3ft	653	2085	29.67	314	0
34	T4-CK16B-4000K-Single37W-3ft	791	2245	29.67	314	0
35	T4-CK16B-4000K-Single37W-3ft	857	2182	29.67	134	0
36	T4-CK16B-4000K-Single37W-3ft	698	2138	29.67	314	0
37	T4-CK16B-4000K-Single37W-3ft	745	2192	29.67	314	0
38	T4-CK16B-4000K-Single37W-3ft	704	1997	29.67	55	0
39	T4-CK16B-4000K-Single37W-3ft	818	2128	29.67	134	0
40	T4-CK16B-4000K-Single37W-3ft	815	2099	29.67	228	0
41	T4-CK16B-4000K-Single37W-3ft	869	1753	29.67	228	0
42	T4-CK16B-4000K-Single37W-3ft	1040	1188	29.67	88	0
43	T4-CK16B-4000K-Single37W-3ft	942	1706	29.67	229	0
44	T4-CK16B-4000K-Single37W-3ft	1124	1241	29.67	180	0
45	T4-CK16B-4000K-Single37W-3ft	1124	1306	29.67	180	0
46	T4-CK16B-4000K-Single37W-3ft	1124	1371	29.67	180	0
47	T4-CK16B-4000K-Single37W-3ft	1127	1440	29.67	188	0
48	T4-CK16B-4000K-Single37W-3ft	1108	1507	29.67	194	0
49	T4-CK16B-4000K-Single37W-3ft	1078	1577	29.67	220	0
50	T4-CK16B-4000K-Single37W-3ft	1031	1625	29.67	225	0

# Glen Helen - Main



Lighting Plan Rev C

Project Number: G6350

By: Michael Zermani  
 michael.zermani@fonroche.us  
 Date: 7/27/2023

10F Roessler Road  
 Woburn, MA 01801  
 Phone Number: (339) 225 4530  
 www.fonrochesolarlighting.com

## Luminaire Schedule

Symbol	Qty	Label	Description	Lumens	LLF
	13	T4-CK16B-4000K-Double37W-3ft	YTR215964	6660	0.900
	50	T4-CK16B-4000K-Single37W-3ft	YTR215964	6660	0.900
	42	T2-CK16B-4000K-Single28W	YTR215925	5320	0.900
	2	T2-CK16B-4000K-Single37W-3ft	YTR215925	7030	0.900
	1	T4-CK16B-4000K-Twin18W	YTR215964	3240	0.900
	2	T4-CK16B-4000K-Single37W	YTR215964	6660	0.900

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
51	T4-CK16B-4000K-Single37W-3ft	985	1666	29.67	225	0
52	T4-CK16B-4000K-Single37W-3ft	815	1670	29.67	354	0
53	T4-CK16B-4000K-Single37W-3ft	840	1595	29.67	47	0
54	T4-CK16B-4000K-Single37W-3ft	886	1546	29.67	47	0
55	T4-CK16B-4000K-Single37W-3ft	931	1502	29.67	35	0
56	T4-CK16B-4000K-Single37W-3ft	959	1447	29.67	12	0
57	T4-CK16B-4000K-Single37W-3ft	972	1387	29.67	0	0
58	T4-CK16B-4000K-Single37W-3ft	973	1321	29.67	0	0
59	T4-CK16B-4000K-Single37W-3ft	972	1257	29.67	0	0
60	T4-CK16B-4000K-Double37W-3ft	632	865	29.67	43	0
61	T4-CK16B-4000K-Double37W-3ft	712	789	29.67	43	0
62	T4-CK16B-4000K-Double37W-3ft	791	712	29.67	43	0
63	T4-CK16B-4000K-Double37W-3ft	872	638	29.67	43	0
64	T4-CK16B-4000K-Double37W-3ft	963	555	29.67	43	0
65	T4-CK16B-4000K-Double37W-3ft	809	501	29.67	43	0
66	T4-CK16B-4000K-Double37W-3ft	736	566	29.67	43	0
67	T4-CK16B-4000K-Double37W-3ft	653	638	29.67	43	0
68	T4-CK16B-4000K-Double37W-3ft	580	713	29.67	43	0
69	T4-CK16B-4000K-Single37W-3ft	536	812	29.67	339	0
70	T2-CK16B-4000K-Single37W-3ft	912	473	29.67	115	0
71	T4-CK16B-4000K-Double37W-3ft	787	617	29.67	43	0
72	T4-CK16B-4000K-Double37W-3ft	692	703	29.67	43	0
73	T4-CK16B-4000K-Double37W-3ft	880	532	29.67	43	0
74	T4-CK16B-4000K-Double37W-3ft	605	793	29.67	43	0
75	T2-CK16B-4000K-Single28W	2321	1406	26.67	130	0
76	T2-CK16B-4000K-Single28W	2230	1304	26.67	163	0
77	T2-CK16B-4000K-Single28W	2213	1174	26.67	182	0
78	T2-CK16B-4000K-Single28W	2122	918	26.67	141	0
79	T2-CK16B-4000K-Single28W	2031	804	26.67	141	0
80	T2-CK16B-4000K-Single28W	1948	686	26.67	141	0
81	T2-CK16B-4000K-Single28W	1885	583	26.67	174	0
82	T2-CK16B-4000K-Single28W	1833	472	26.67	326	0
83	T2-CK16B-4000K-Single28W	1765	345	26.67	134	0
84	T2-CK16B-4000K-Single28W	1495	323	26.67	72	0
85	T2-CK16B-4000K-Single28W	1320	522	26.67	217	0
86	T2-CK16B-4000K-Single28W	1116	881	26.67	19	0
87	T2-CK16B-4000K-Single28W	966	1078	26.67	55	0
88	T2-CK16B-4000K-Single28W	836	1327	26.67	15	0
89	T2-CK16B-4000K-Single28W	682	1545	26.67	42	0
90	T2-CK16B-4000K-Single28W	577	1509	26.67	186	0
91	T2-CK16B-4000K-Single28W	555	1384	26.67	347	0
92	T2-CK16B-4000K-Single28W	532	1243	26.67	162	0
93	T2-CK16B-4000K-Single28W	522	1116	26.67	34	0
94	T2-CK16B-4000K-Single28W	551	917	26.67	304	0
95	T4-CK16B-4000K-Twin18W	577	1639	26.67	16	0
96	T4-CK16B-4000K-Single37W	493	1703	26.67	42	0
97	T4-CK16B-4000K-Single37W	400	1782	26.67	42	0
98	T2-CK16B-4000K-Single28W	301	1868	26.67	42	0
99	T2-CK16B-4000K-Single28W	365	1927	26.67	222	0
100	T2-CK16B-4000K-Single28W	199	1965	26.67	42	0

# Glen Helen - Main



**FONROCHE**  
lighting AMERICA

Lighting Plan Rev C

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	1	T4-CK16B-4000K-Twin18W	YTR215964	3240	0.900
	2	T4-CK16B-4000K-Single37W	YTR215964	6660	0.900

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
101	T2-CK16B-4000K-Single28W	263	2024	26.67	222	0
102	T2-CK16B-4000K-Single28W	707	1679	26.67	311	0
103	T2-CK16B-4000K-Single28W	766	1820	26.67	35	0
104	T2-CK16B-4000K-Single28W	736	1943	26.67	355	0
105	T2-CK16B-4000K-Single28W	902	2105	26.67	135	0
106	T2-CK16B-4000K-Single28W	1027	2282	26.67	320	0
107	T2-CK16B-4000K-Single28W	1139	2368	26.67	148	0
108	T2-CK16B-4000K-Single28W	1163	2561	26.67	357	0
109	T2-CK16B-4000K-Single28W	1186	2699	26.67	189	0
110	T2-CK16B-4000K-Single28W	1098	2807	26.67	31	0

NOT FOR BIDDING

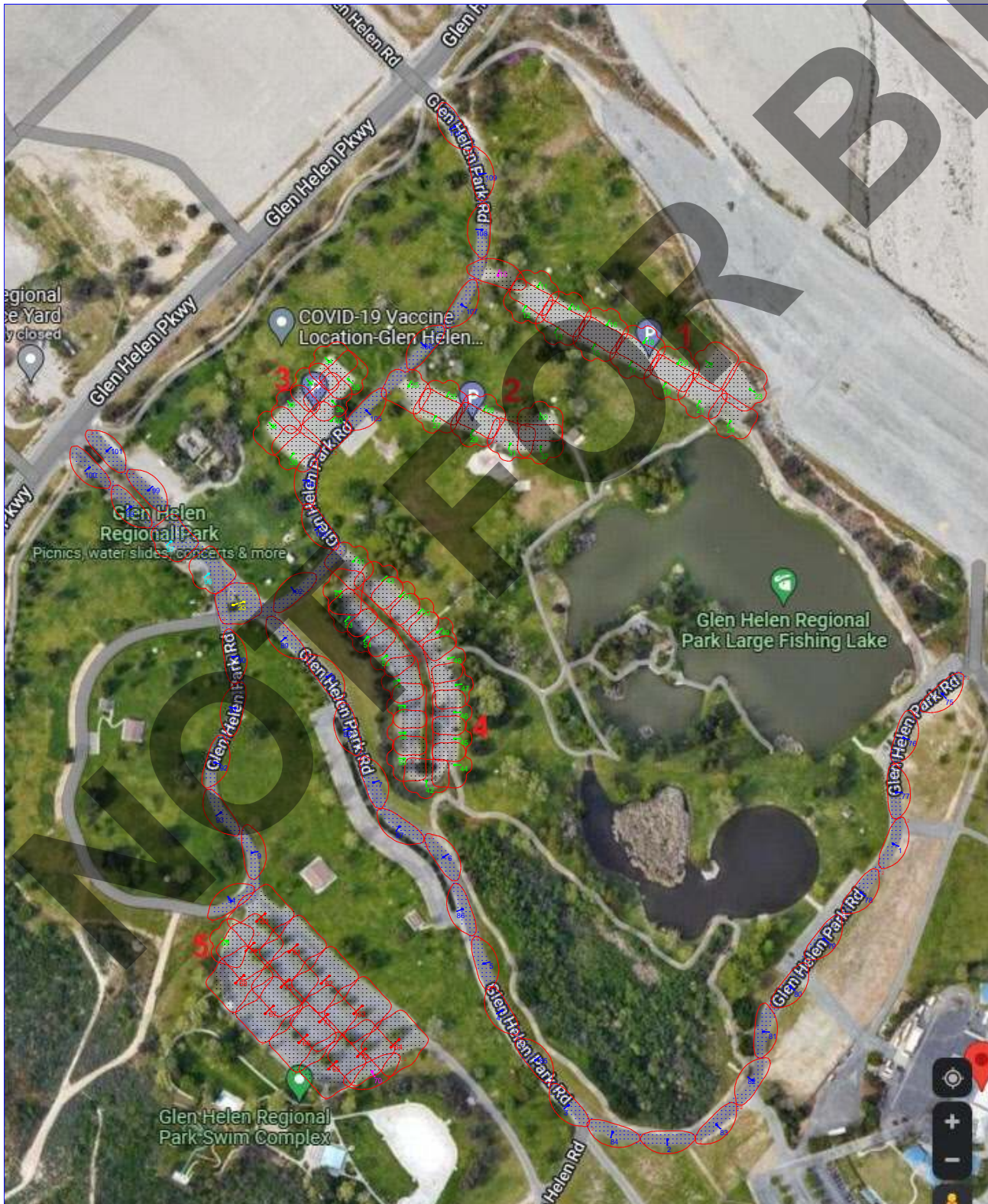
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Date: 7/27/2023

10F Roessler Road  
Woburn, MA 01801  
Phone Number: (339) 225 4530  
www.fonrochesolarlighting.com





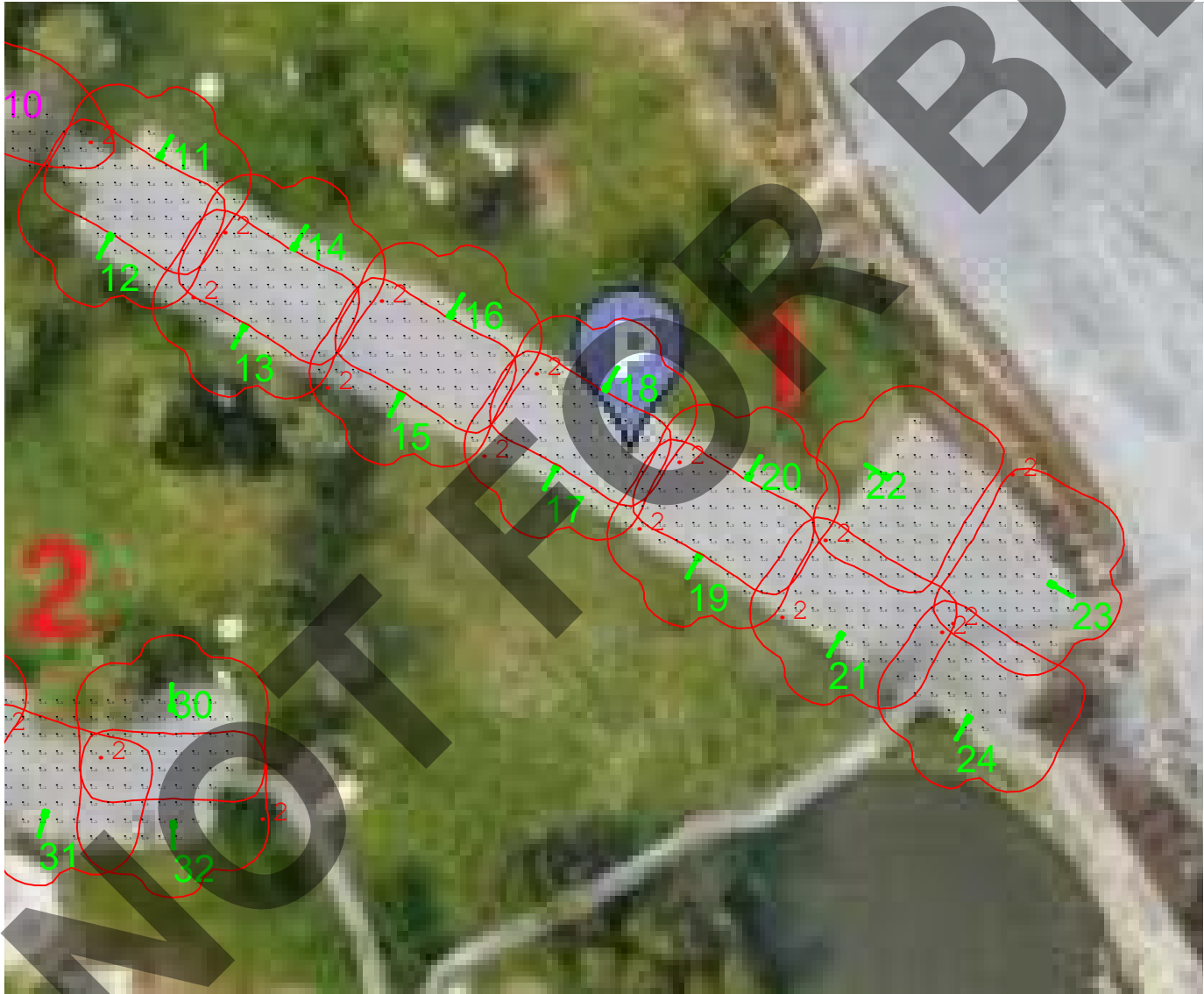
# Glen Helen - Main



Lighting Plan Rev C  
Project Number: G6350

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Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	13	T4-CK16B-4000K-Double37W-3ft	BACK-BACK	6660	0.900	YTR215964
	50	T4-CK16B-4000K-Single37W-3ft	SINGLE	6660	0.900	YTR215964
	42	T2-CK16B-4000K-Single28W	SINGLE	5320	0.900	YTR215925
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Lot 2	Illuminance	Fc	1.01	1.5	0.4	2.53	3.75
Lot 3	Illuminance	Fc	1.07	1.7	0.3	3.57	5.67
Lot 4	Illuminance	Fc	1.01	1.6	0.4	2.53	4.00
Lot 5	Illuminance	Fc	1.11	2.3	0.3	3.70	7.67
Roads	Illuminance	Fc	0.69	1.9	0.2	3.45	9.50

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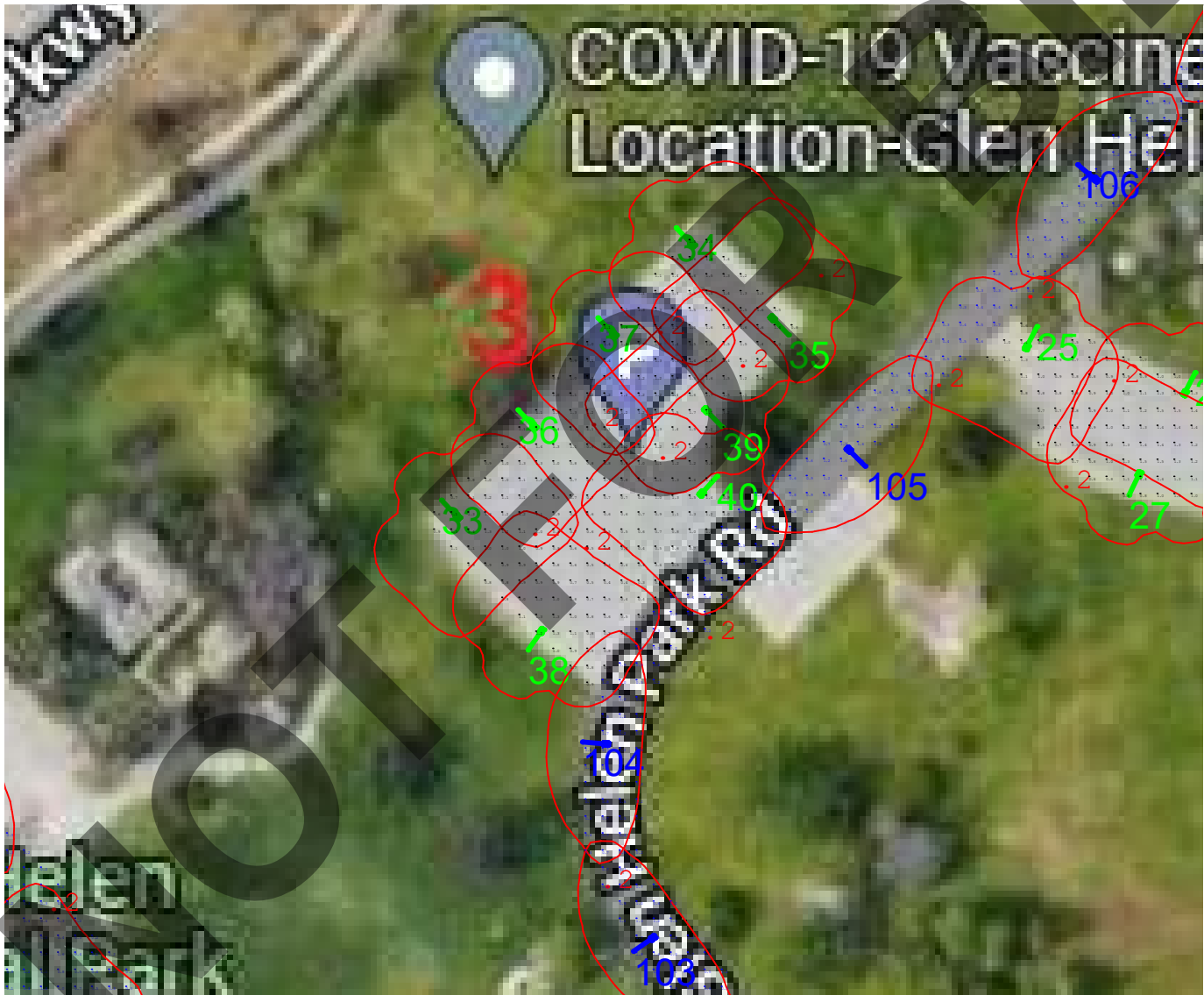
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**FONROCHE**  
lighting AMERICA

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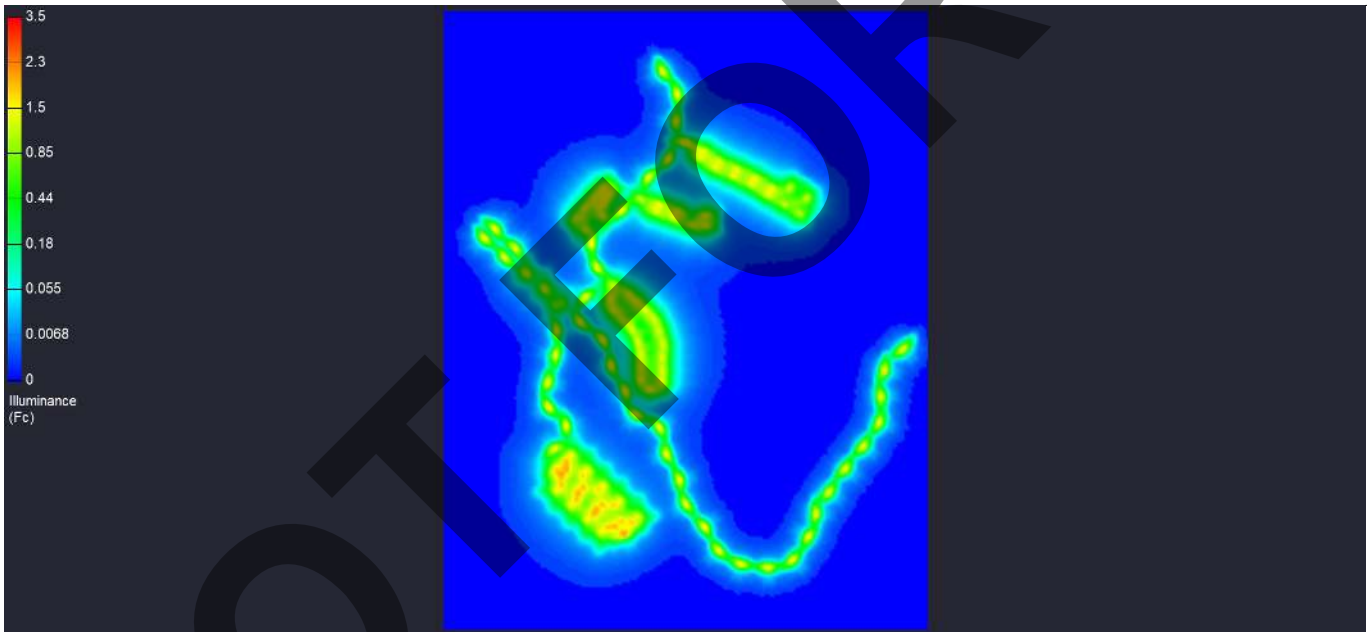


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A few examples





**FONROCHE**  
lighting AMERICA

Solar lighting

Your commitment to sustainability

**Contact us**

**Dale Curtis**

*VP of Sales*

**M: (208) 484-8993**

**E: dale.curtis@Fonroche.US**

FIND OUT MORE AT

[www.FonrocheSolarLighting.com](http://www.FonrocheSolarLighting.com)

FONROCHE LIGHTING AMERICA | 4900 David Strickland Road  
Forest Hill, TX 76119 | USA  
Telephone : 339-225-4530

Fonroche Lighting America Design Office



**FIRSTLIGHT**  
TECHNOLOGIES

# Glen Helen Solar Lighting

## Design and Photometric Analysis

*August 8, 2023*



**GLEN HELEN**  
REGIONAL PARK - AMPHITHEATER - WATER PARK

UPCOMING EVENTS

Engineered by:



**Intelligent Lighting Systems**  
Design + Procurement

# Quality Design

FIRSTLIGHT  
TECHNOLOGIES



Local Conditions



Compliant



Constructable



Local Conditions

Quality design requires careful consideration of Local Conditions. As lifelong SoCal residents, we have designed this project with all our local expertise. **Specifically, we know that there are large old trees onsite and we have designed the lighting around them, instead of ignoring them.**



Compliant

Since our design is accurate for the local conditions, it can be relied on to function as described on the plans. **The First Light Design is NEC/IES compliant on paper, and when installed.**



Constructable

The plans provided with the First Light Design are of industry-standard quality and constructability. Further, iLs will support the County with any additional engineering/consulting information required/requested during bid or construction. **Our goal is to reduce the number of Change Orders from unknown to 0.**



We make beautiful light simple.

# Solar Lighting Summary

## First Light Design Summary






Below is the fixture schedule for the entire project. There are (3) distinct assemblies detailed on the following pages.

**Single** - One Solar Engine and One Fixture with short arm.

**Twin** - Two Solar Engines and Two Fixtures with short arm for each fixture.

**Twin 4'** - Two Solar Engines and Two Fixtures with 4' arm for each fixture.

### LUMINAIRE SCHEDULE

SYM.	TYPE	MANUFACTURER	FIXTURE	POLE	LUMENS	CONNECTED LOAD	MOUNTING HEIGHT	QTY
	A	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 2 DISTRIBUTION	FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	44
	B	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 2 DISTRIBUTION	FIRST LIGHT TECHNOLOGIES	7030	0 W	28'	9
	C	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 4 DISTRIBUTION	FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	32
	D	FIRST LIGHT TECHNOLOGIES	TWIN: BFL-TYPE 4 DISTRIBUTION	FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	13
	E	FIRST LIGHT TECHNOLOGIES	TWIN: BFL-4FT ARM-TYPE 4 DISTRIBUTION	FIRST LIGHT TECHNOLOGIES	7030	0 W	28'	7

ALL SUBSTITUTIONS MUST BE APPROVED IN WRITING BY ENGINEER OF RECORD, EEOB, MINIMUM (10) TEN DAYS PRIOR TO BID. FIXTURE CUT SHEETS, IES FILES, AND FULL PHOTOMETRIC CALCULATIONS REQUIRED FOR EVALUATION OF SUBSTITUTION BY EEOB.

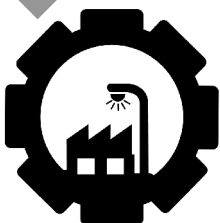
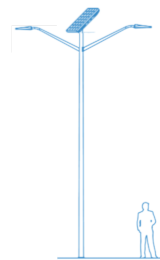
Single



Twin

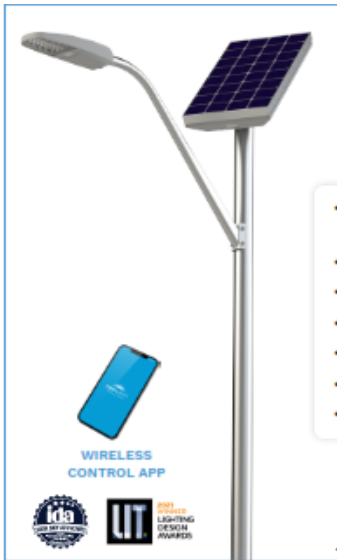


Twin 4'



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# Detailed Product Info



The BFL Series solar LED street light is a great fit for residential and collector street lighting as well as parking lot lighting applications. The self-contained, unobtrusive solar engine design integrates its solar power, battery and adaptive control capabilities into a compact and simple form. This, combined with an efficient LED fixture, makes the BFL Series an excellent fit where high performance, full cutoff and cost-effective lighting is required.

- With the latest solar, LED and lithium battery technology, the BFL series offers significant advantages:
- Cost-effective design ships fully assembled and installs in minutes
- Low installation cost and minimal site impact with no trenching or cabling
- Wireless control & communication with your light
- Minimal ongoing costs with no electrical bills
- Operates entirely independent from the grid and is immune to power outages
- A sustainable choice without recurring carbon emissions

All of our solar powered lights are enabled by our innovative Solar Lighting Controller (SLC). The controller in each light is "self-learning" and allows the lights to predictively adapt to their surroundings, providing an unsurpassed level of lighting performance and reliability.

## TECHNICAL SPECIFICATIONS

- Solar Module:**
- High-efficiency monocrystalline cells
  - Inconspicuously integrated into the low profile solar engine
  - Used for day/night detection (no photocell required)

- Solar Lighting Controller (SLC):**
- High-efficiency, maximum power point tracking (MPPT)
  - Microcontroller based technology
  - Multiyear data logging
  - Integrated into solar engine housing
  - Designed to adaptively manage lighting performance based on environmental conditions and lighting requirements

- Battery:**
- High-performance lithium (LiFePO4)
  - Exceptional 10+ year lifecycle
  - High temperature tolerance
  - Contained within solar engine housing
  - Designed for easy battery changes

- Mechanical:**
- Solar engine housing formed from marine-grade, corrosion resistant, aluminum alloy
  - Internal top of pole mount structure
  - Toolless access
  - Architectural grade, durable, TGIC powder coat

- LEDs and Optics:**
- 100,000 hour L70 lifetime LED
  - Extra Warm White (2700K), Warm White (3000K), Neutral White (4000K), and Amber (595nm) LEDs available
  - High-efficiency type 2S, 2M, 3S, 3M, 4, 5 optics
  - Full cutoff optics and Dark-Sky approved at 3000K
  - High Lumen output.
  - Integrated weatherproof, high-efficiency, dimmable LED driver

- Factory Set Lighting Profiles:**
- Real-time based lighting profiles allow you to comply with the Model Lighting Ordinance, dimming after curfew, or during periods of low pedestrian conflict
  - 11 standard duration based lighting profiles available
  - Lighting profiles are field configurable with app
  - Visit our website for all options

- Wireless Controls:**
- Easy-to-use interface via iOS smartphone app
  - Configure and control lighting profiles
  - Adjust dusk and dawn thresholds

- Pole Options:**
- Various pole height and mast arm length options available
  - Pre-drilled for seamless installation



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# Featured Project: HEIRLOOM FARMS



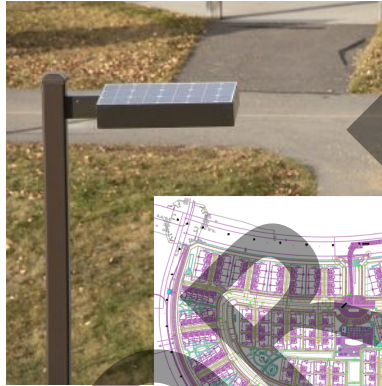
Setting the standard  
for energy-efficient homes®



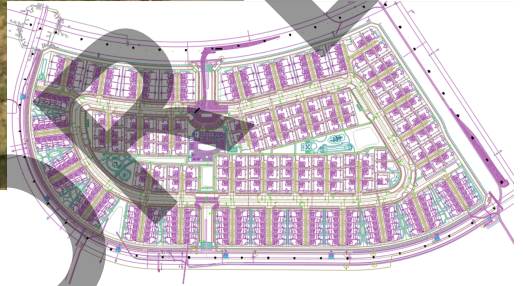
**Client:** Meritage Homes

**Contact:** Efreem Joelson  
(310) 266-8715

efrem.joelson@meritagehomes.com



FIRSTLIGHT  
TECHNOLOGIES



## Project Description

iLs worked on behalf of Meritage Homes and First Light Technologies to design and permit the site lighting at a master development named Heirloom Farms. As an example of Meritage's commitment to energy efficiency, iLs designed the project to be 100% solar and worked with City of Temecula to obtain approval. iLs provided fully engineered plans with photometry and project specific detailing. Project is permitted and currently in construction.

## Client Response

While the project is still in construction, both the client and City are excited to be building a master development that can serve as an example of the future of lighting. Furthermore, when budgeted, the project was significantly cheaper than a traditionally powered system. iLs worked diligently to be able to deliver this level of innovation while maintaining traditional budget goals.

  
Engineered Plans

  
Photometry

  
Budgeting

  
Eco-Friendly Design



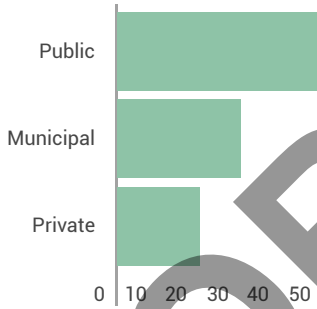
We make beautiful light simple.

# Intelligent Lighting Systems, Inc.



**Phone:** (760) 833-0401  
**Contact:** 877 W. 4th St.  
 Beaumont, CA 92223  
 Sales@iLightingSystems.com

## Market Sectors



## Why iLs?

Our professionals utilize their varied expertise to efficiently produce beautifully lit projects. From initial concept through project commissioning, no consultant is better suited to provide accurate, constructible documents and economically responsible consulting.

Street Light Design  
40%

Decorative /  
Landscape  
Lighting  
20%

Park / Paseo  
Design  
20%

3D Renderings  
10%

Parking Lot  
Design  
10%

## Ownership

Holli Love is majority owner, Chairperson and President of Intelligent Lighting Systems Inc.

## Diversity



## Clients



We make beautiful light simple.





## Product Guide Specification

First Light Technologies' solar-powered commercial lights add functional illumination to your pedestrian area, pathway, security, and streetscape projects. Use integrated solar-powered commercial lights as stand-alone lights and design features for new and existing lighting projects.

### SELF-LEARNING SOLAR POWERED LED STREET LIGHT

Specifier Notes: This section covers First Light Technologies' "BFL Series" solar street light. Consult First Light Technologies for any required assistance in editing this section for the specific application.

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. BFL Series Solar Street Light

##### 1.2 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

A. ASTM Testing Standards:

1. ASTM D2244 - 11 Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
2. ASTM D523 - 08 Standard Test Method for Specular Gloss
3. ASTM D5723 - 95(2010) Standard Practice for Determination of Chromium Treatment Weight on Metal Substrates by X-Ray Fluorescence
4. ASTM D3363 - 05(2011)e2 Standard Test Method for Film Hardness by Pencil Test
5. ASTM D968 - 05(2010) Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
6. ASTM D2244 - 11 Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
7. ASTM D3359 - 09e2 Standard Test Methods for Measuring Adhesion by Tape Test
8. ASTM D2247 - 11 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity

9. ASTM D714 - 02(2009) Standard Test Method for Evaluating Degree of Blistering of Paints
10. ASTM B117 - 11 Standard Practice for Operating Salt Spray (Fog) Apparatus
11. ASTM D1654 - 08 Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
12. ASTM D4214 - 07 Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
13. ASTM B244 - 09 Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments
14. ASTM B26 / B26M - 12 Standard Specification for Aluminum-Alloy Sand Castings
15. ASTM B308 / B308M - 10 Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles

B. ISO Vendors:

1. ISO 9001/2008 Certified Metal Manufacturers and electronics manufacturers

**1.3 SUBMITTALS**

- A. Specification Sheet: Submit manufacturer's product specification showing technical features, dimensioned line drawings, photometrics and product order matrix.
- B. Installation Sheet: Submit manufacturer's installation sheet.
- C. Warranty: Manufacturer's standard warranty.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

**1.5 WARRANTY – 5 YEAR**

A. Warranty Information:

Warranty: All materials and component parts, including battery, are guaranteed to be free from defects of material and/or workmanship for a period of five years beginning on the date of shipment to the Buyer. FLT assumes no responsibility for installation or proper selection of its products. This warranty excludes field labor or service charges related to the repair or replacement of the product.

**PART 2 PRODUCTS**

**2.1 MANUFACTURER**

A. Acceptable Manufacturer:

**First Light Technologies Ltd.**, 3303B Tennyson Ave, Victoria, British Columbia, V8Z 3P5

Phone: +1 844-279-8754

Website: [www.firstlighttechnologies.com](http://www.firstlighttechnologies.com)

E-mail: [info@firstlighttechnologies.com](mailto:info@firstlighttechnologies.com)

## 2.2 SOLAR POWERED LED STREET LIGHTS

A. BFL Series Solar Powered LED Street Lights [Designer's Designation]

1. Model: First Light Technologies Ltd., **Model BFL Series**

(<https://www.firstlighttechnologies.com/solar-lighting-products/bfls-solar-street-light/>)

2. Design: The system must consist of a top of pole mounted solar engine that houses the solar panel, a single battery, and controller in a single self-contained unit. The LED luminaire must be mounted separately to the pole and must be capable of providing light intensity and distribution that meet IES guidelines for the application.

- a. Solar engine effective projected area must not exceed 3.5 square feet, and must weigh no more than 65 pounds including the battery
- b. Luminaire effective projected area must not exceed 0.52 square feet, and must weigh no more than 9.4 pounds
- c. System must be designed for operation in temperatures between -4F and +120F
- d. System must be designed for up to 180 MPH wind loads

3. Mount:

- a. Solar engine must be able to mount to a pole less than or equal to 10" diameter
- b. Solar engine must mount to the pole in such a manner that does not require the pole to be drilled
- c. Solar engine must have an integrated mount for fastening to a standard 2 3/8" diameter post-top tenon
- d. Optional pre-engineered poles must be supplied with mounting height range of 20', 25', and 30' and must have luminaire mast arm options of 4', 6', and 8', or a horizontal luminaire tenon
- e. Luminaire must be able to mount on a mast arm or 1' horizontal tenon
- f. Solar engine must not protrude higher than 2' above top of pole

4. Solar Engine Enclosure:

- a. Solar engine must have a single opening which provides barrier free access to all components for easy maintenance and replacement
- b. Solar engine must be at most 6.125" thick
- c. Solar engine enclosure must be formed from marine grade aluminum
- d. Solar engine must have a fixed tilt angle of 40 degrees and must rotate horizontally by 360 degrees
- e. Solar engine must have tool-less entry and must have a prop-stick that automatically engages in any solar engine orientation with pole vertical or horizontal to keep the solar panel door in place when opened

- f. Solar engine must have mistake proof, keyed, automotive grade, IP67 latching connectors for the solar panel, battery, controller and luminaire
  - g. Cabling must be UV resistant and outdoor rated
6. Fasteners:
  - a. Solar engine must use stainless steel and/or aluminum fasteners
7. Color Coating:
  - a. Type: Outdoor, Architectural grade, TGIC polyester powder coat. Finish in accordance with AAMA 2604-05 test procedures
  - b. Color: [Black] [Bronze] [White] [Gray]
8. Installation:
  - a. System must not require any site specific configuration.
  - b. Solar engine must require no on-site assembly
  - c. The system must use an automatic self test when batteries are connected as the only required commissioning step
9. Luminaire:
  - a. LED driver must be a separate component mounted in the luminaire
  - b. LED driver must support 0-10V dimming
10. LED Color Temperature:
  - a. Luminaire must be available with the following color temperatures: 2700K, 3000K, 4000K
11. Lighting Distribution:
  - a. Luminaire must be available with the following IES light distributions: Type 2S, Type 2M, Type 3S, Type 3M Type 4, Type 5
  - b. Luminaire must have a BUG rating of B1 U0 G1 and must be Dark Sky approved with 2700K and 3000K
  - c. Luminaire shall have optional pre-installed backlight shield
12. Energy Management System:
  - a. Solar charging system must incorporate self-learning adaptive light management to ensure reliable operation in all conditions, and utilize a MPPT topology for maximum efficiency
  - b. Battery must be a single, sealed lithium iron phosphate (LiFePO4)
  - c. Battery must be no thicker than 5"
  - d. Battery must weigh no more than 35 pounds
  - e. Battery connection must use a sealed, keyed and latched automotive connector with no exposed DC voltage when connected
  - f. Battery must have a BMS including over-charge protection, over-discharge protection, over-current protection, over-temperature protection, cell balancing
  - g. System, with adaptive capabilities, must provide lighting with autonomy of at least 14 days

- h. Controller shall automatically configure to the local time, including daylight savings where used, and must have light profiles to allow light intensity adjustment by time of day in accordance to IES recommended practice
- i. Light profiles must be factory set and must be field adjustable with a wireless mobile application

Duration Based Lighting Profiles and Real-Time Based Lighting Profile options: Preprogrammed at factory or field configurable via Solar Light Control Smartphone App.

Duration Based Lighting Profile Options:

- 00. On at dusk, off at dawn
- 01. On at dusk, off after 6 hours
- 02. On at dusk, dim to 30% after 6 hours till dawn
- 03. On at dusk, off after 5 hours, on 1 hour before dawn
- 04. On at dusk, dim to 30% after 5 hours, on 1 hour before dawn
- 05. On at dusk, off after 3 hours
- 06. On at dusk, off after 4 hours
- 07. On at dusk, of after 4 hours, on 1 hour before dawn
- 08. Off
- 09. On at dusk, dim to 30% after 3 hours, on 1 hour before dawn
- 10. 30% at dusk, off at dawn

Real-Time Based Lighting Profile options:

On at dusk > Off or dim at specified time between 18:00 and 06:00 > Off at dawn (if applicable)

Order Key Code = TX0000X0000

- T = Real-time based lighting profile
- X = Choose O for Off, L for Low (30%) or M for Medium (50%) or B for Bright.
- 0000 = Choose event time between 00:00 and 23.59. Examples: 2230 = 10:30 pm, 0000 = midnight, 0100 = 1:00 am.

- j. Controller must have internal daily data logging. Data must be available via wireless mobile app
- k. Controller must be capable of software upgrades via wireless mobile app
- l. Controller must be housed in a sealed, automotive grade enclosure

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to receive lights.
- B. Notify designer of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

**3.2 INSTALLATION**

- A. Install lights in accordance with manufacturer's instructions at locations indicated on the drawings that have 2 to 3 hours of midday southern sun exposure.
- B. Install lights plumb.

**3.3 PROTECTION**

- A. Protect installed lights to ensure that, except for normal weathering, system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

NOT FOR BID

---

# JD ENGINEERING, LLC

Jacob Daye, P.E.

CA license No. 86191

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August 10, 2023

James Love  
Intelligent Lighting Systems, Inc.  
877 W 4<sup>th</sup> Street, Suite A  
Beaumont, CA 92223

Re: 28 ft Tall Solar Light Pole Footings  
2555 Glen Helen Parkway  
San Bernardino, CA 92407

Dear Mr. Love:

At your request, I have provided the design of the concrete footing and base of the above referenced project and light pole. Please see attached Exhibit #1 for detail regarding construction of the footing. Calculations for the basis and justification of design have also been provided.

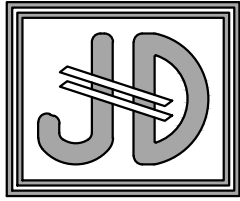
Sincerely,

Jacob Daye, P.E.



Attach: Exhibit #1, C1-C2, and light specs A1-A2

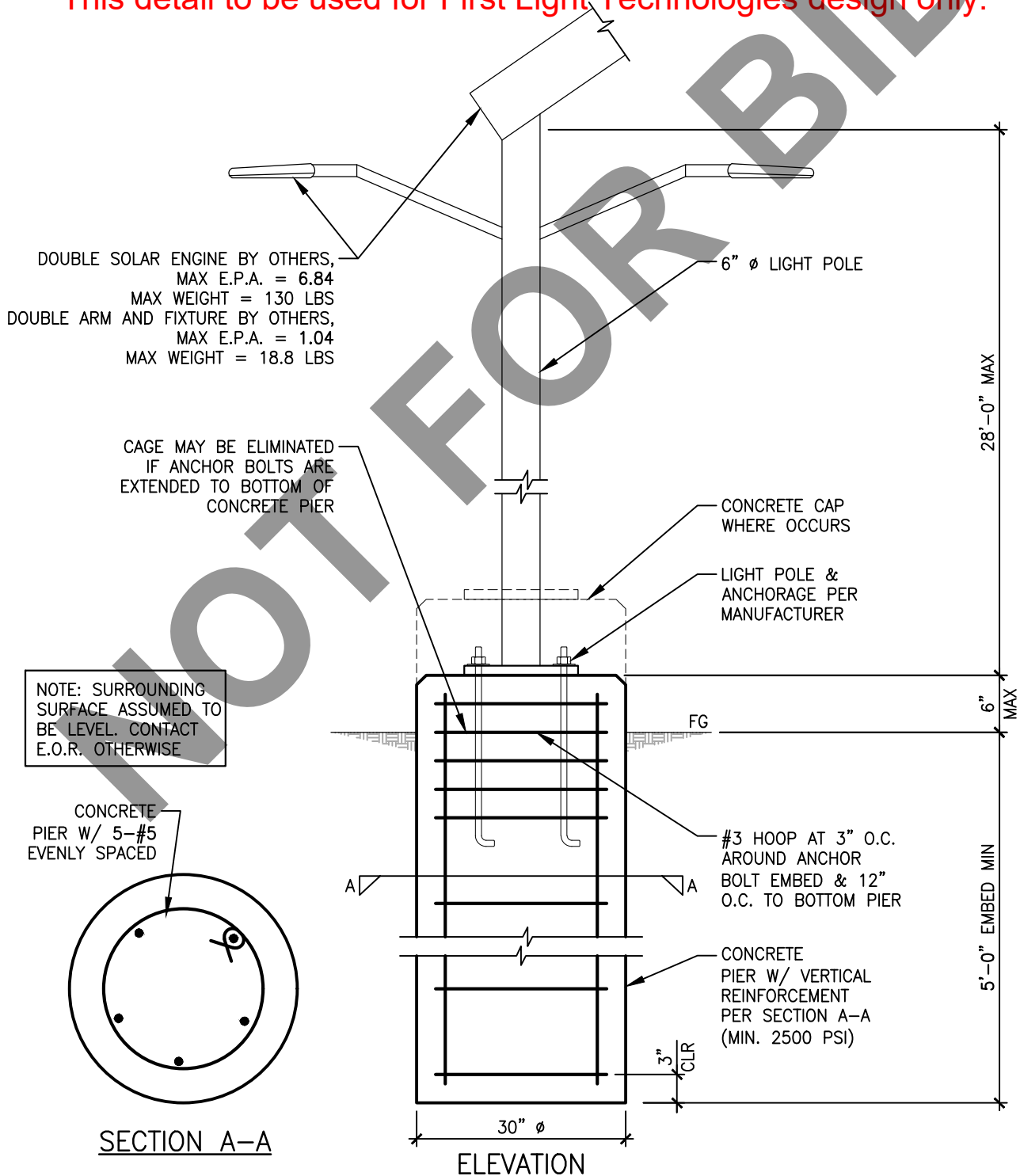
[https://jdenengineeringllc-my.sharepoint.com/personal/jake\\_jdenengineeringllc\\_onmicrosoft\\_com/documents/desktop/000-project folder/303-ils glen helen ligh pole footing/01 structural letter - benton road, riverside light pole footing 2023-05-28.docx](https://jdenengineeringllc-my.sharepoint.com/personal/jake_jdenengineeringllc_onmicrosoft_com/documents/desktop/000-project%20folder/303-ils%20glen%20helen%20ligh%20pole%20footing/01%20structural%20letter-benton%20road,riverside%20light%20pole%20footing%202023-05-28.docx)



PROJECT: GLEN HELEN LIGHT POLE  
SAN BERNARDINO, CA

JOB NO.: 303-ILS  
PROJ. ENGR.: JD  
SCALE: N.T.S.  
DATE: 8-10-2023

This detail to be used for First Light Technologies design only.





# Wind Design and Loading for Light Pole Footing

ASCE 7-16 Chp. 29

Light Pole Height= **28** ft      w/ max base h= **30** inch

## Velocity Pressure

$qz = .00256 * Kz * Kzt * Kd * Ke * V^2$	Eqn.	26.10-1
w/ $Kz =$ <b>0.9</b>	Sec.	26.10.1
$Kzt =$ <b>1</b>	Sec.	26.8.2
$Kd =$ <b>0.9</b>	Sec.	26.6-1
$Ke =$ <b>1</b>	Sec.	26.9
$V^2 =$ <b>110</b> mph	Sec.	26.5

$qz =$  25.1 psf (ult)

## Design Wind Loading

$F = qz * G * Cf * Af$	Eqn.	29.4-1
w/ $qz =$ 25.1		
$G =$ <b>0.85</b>	Sec.	26.11
$Cf =$ <b>1.2</b>	Fig.	29.4-1
		29.4-4

$F =$  25.6 psf (ult)  
 $x.7$  17.9 psf (asd)

## Wind Load to Fixture

$P = F * Af$ (EPA)
w/ $F =$ 25.6
$Af$ (EPA) = <b>8.9</b>

$P =$  227.3 lbs (ult)  
 159.1 lbs (asd)

## Wind Load to Pole

$w = F * Af$ (dia. of pole)
w/ $F =$ 25.6 psf (ult)
Dia. Pole = <b>6.0</b> inch

$w =$  12.8 plf (ult)  
 9.0 plf (asd)

Note: See following Enercalc sheets for footing design  
 top 6" of depth ignored

## Pole Footing Embedded in Soil

Project File: 303-ils.ec6

LIC# : KW-06012716, Build:20.23.05.25

JD ENGINEERING, LLC

(c) ENERCALC INC 1983-2023

**DESCRIPTION:** 28 ft tall light pole footing

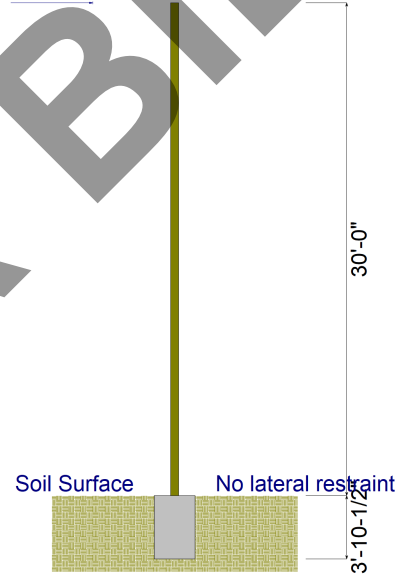
### Code References

Calculations per IBC 2021 1807.3, ASCE 7-16  
 Load Combinations Used : ASCE 7-16

### General Information

Pole Footing Shape	Circular
Pole Footing Diameter	30.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 pcf

Point Load



### Controlling Values

Governing Load Combination	D+0.60W
Lateral Load	0.1362 k
Moment	4.086 k-ft

NO Ground Surface Restraint

### Pressures at 1/3 Depth

Actual	317.034 psf
Allowable	319.399 psf

**Minimum Required Depth 3.875 ft**

Footing Base Area	4.909 ft <sup>2</sup>
Maximum Soil Pressure	0.04074 ksf

### Applied Loads

Lateral Concentrated Load (k)	Lateral Distributed Loads (kl)	Vertical Load (k)
D : Dead Load	k/ft	0.20 k
Lr : Roof Live	k/ft	k
L : Live	k/ft	k
S : Snow	k/ft	k
W : Wind	0.01280 k/ft	k
E : Earthquake	0.0010 k/ft	k
H : Lateral Earth	k/ft	k
Load distance above ground surface	TOP of Load above ground surface	
	BOTTOM of Load above ground surface	

### Load Combination Results

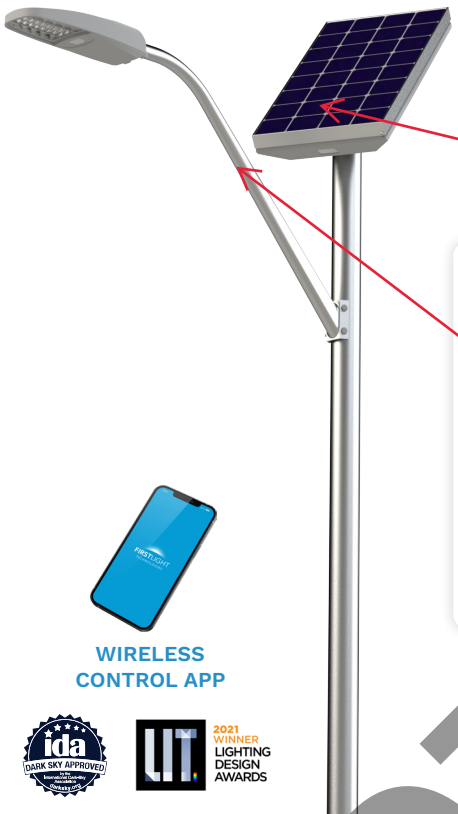
Load Combination	Forces @ Ground Surface		Required Depth - (ft)	Pressure at 1/3 Depth		Soil Increase Factor
	Loads - (k)	Moments - (ft-k)		Actual - (psf)	Allow - (psf)	
D Only	0.000	0.000	0.13	0.0	0.0	1.000
+D+0.60W	0.136	4.086	3.88	317.0	319.4	1.000
+D+0.450W	0.102	3.065	3.50	288.5	288.5	1.000
+0.60D+0.60W	0.136	4.086	3.88	317.0	319.4	1.000
+D+0.70E	0.070	2.100	3.13	252.4	253.8	1.000
+D+0.5250E	0.053	1.575	2.88	229.5	229.6	1.000
+0.60D+0.70E	0.070	2.100	3.13	252.4	253.8	1.000

Project: \_\_\_\_\_

Type: \_\_\_\_\_

Quantity: \_\_\_\_\_

The BFL Series solar LED street light is a great fit for residential and collector street lighting as well as parking lot lighting applications. The self-contained, unobtrusive solar engine design integrates its solar power, battery and adaptive control capabilities into a compact and simple form. This, combined with an efficient LED fixture, makes the BFL Series an excellent fit where high performance, full cutoff and cost-effective lighting is required.



**2-SOLAR PANELS**

**2-FIXTURES**

- With the latest solar, LED and lithium battery technology, the BFL series offers significant advantages:
- Cost-effective design ships fully assembled and installs in minutes
- Low installation minimal site impact with no trenching or cabling
- Wireless control & communication with your light
- Minimal ongoing costs with no electrical bills
- Operates entirely independent from the grid and is immune to power outages
- A sustainable choice without recurring carbon emissions

All of our solar powered lights are enabled by our innovative Solar Lighting Controller (SLC). The controller in each light is “self-learning” and allows the lights to predictively adapt to their surroundings, providing an unsurpassed level of lighting performance and reliability.

WIRELESS CONTROL APP



## TECHNICAL SPECIFICATIONS

- Solar Module:**
- High-efficiency monocrystalline cells
  - Inconspicuously integrated into the low profile solar engine
  - Used for day/night detection (no photocell required)

- Solar Lighting Controller (SLC):**
- High-efficiency, maximum power point tracking (MPPT)
  - Microcontroller based technology
  - Multiyear data logging
  - Integrated into solar engine housing
  - Designed to adaptively manage lighting performance based on environmental conditions and lighting requirements

- Battery:**
- High-performance lithium (LiFePO4)
  - Exceptional 10+ year lifecycle
  - High temperature tolerance
  - Conotained within solar engine housing
  - Designed for easy battery changes

- Mechanical:**
- Solar engine housing formed from marine-grade, corrosion resistant, aluminum alloy
  - Internal top of pole mount structure
  - Toolless access
  - Architectural grade, durable, TGIC powder coat

- LEDs and Optics:**
- 100,000 hour L70 lifetime LED
  - Extra Warm White (2700K), Warm White (3000K), Neutral White (4000K), and Amber (595nm) LEDs available
  - High-efficiency type 2S, 2M, 3S, 3M, 4, 5 optics
  - Full cutoff optics and Dark-Sky approved at 3000K
  - Typical lumen output of 6400 lumens
  - Integrated weatherproof, high-efficiency, dimmable LED driver

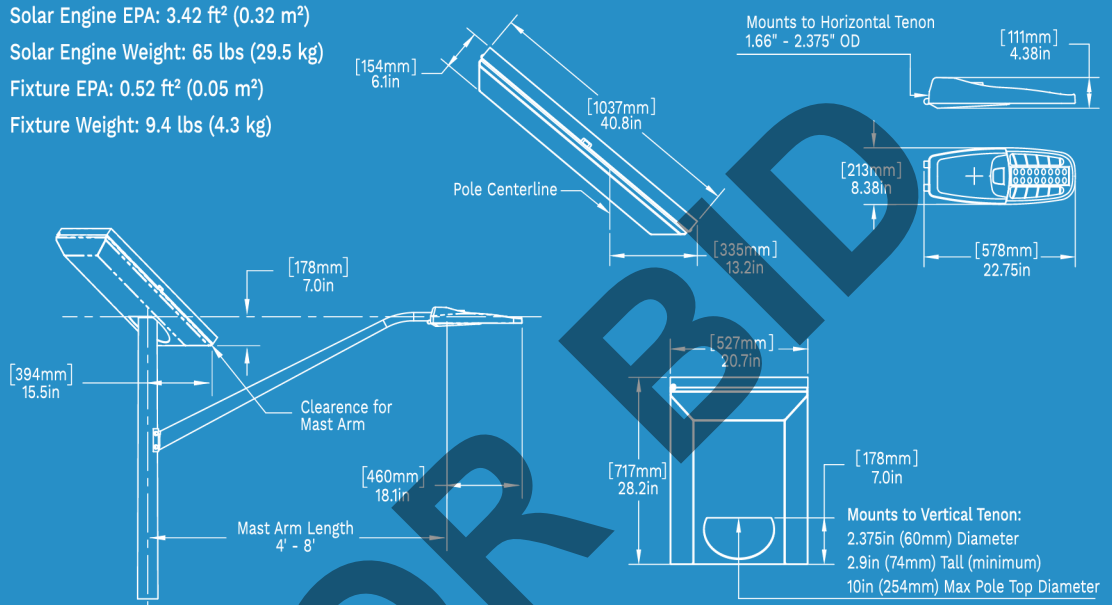
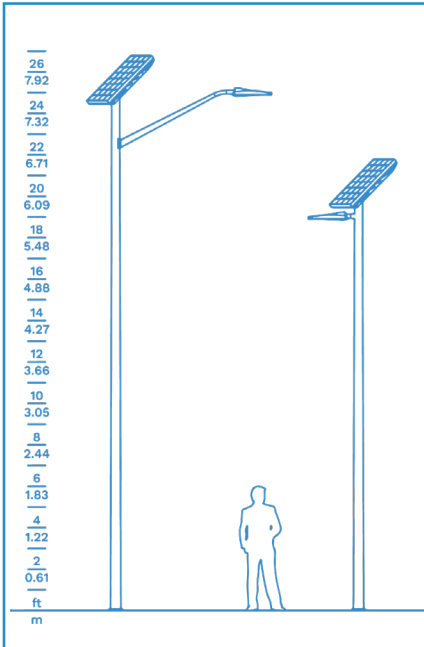
- Factory Set Lighting Profiles:**
- Real-time based lighting profiles allow you to comply with the Model Lighting Ordinance, dimming after curfew, or during periods of low pedestrian conflict
  - 11 standard duration based lighting profiles available
  - Lighting profiles are field configurable with app
  - Visit our website for all options

- Wireless Controls:**
- Easy-to-use interface via iOS smartphone app
  - Configure and control lighting profiles
  - Adjust dusk and dawn thresholds

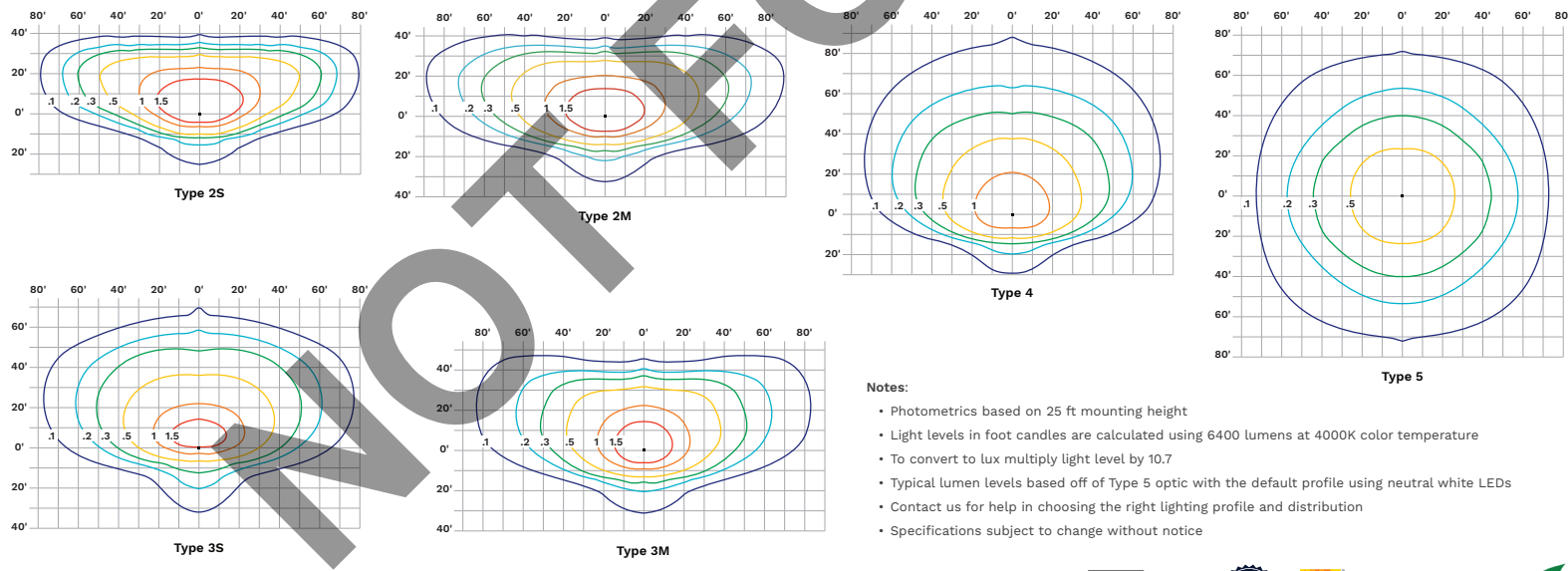
- Pole Options:**
- Various pole height and mast arm length options available
  - Pre-drilled for seamless installation

## SOLAR LED STREET & AREA LIGHT

Solar Engine EPA: 3.42 ft<sup>2</sup> (0.32 m<sup>2</sup>)  
 Solar Engine Weight: 65 lbs (29.5 kg)  
 Fixture EPA: 0.52 ft<sup>2</sup> (0.05 m<sup>2</sup>)  
 Fixture Weight: 9.4 lbs (4.3 kg)



### PHOTOMETRICS (IES files available on our website)



- Notes:**
- Photometrics based on 25 ft mounting height
  - Light levels in foot candles are calculated using 6400 lumens at 4000K color temperature
  - To convert to lux multiply light level by 10.7
  - Typical lumen levels based off of Type 5 optic with the default profile using neutral white LEDs
  - Contact us for help in choosing the right lighting profile and distribution
  - Specifications subject to change without notice

### ORDER MATRIX



Series	Solar Engine			Fixture				
	Mounting	Finish	Lighting Profiles (Contact us or visit our website for more options)	Mounting	Finish	Distribution	LED Colors	Options
BFL	TM - 2.375 Inch Tenon Mount	BK - Black	TM2200B0600 - On at dusk > dim to 50% at 10:00pm > brighten to 100% at 6:00am > off at dawn (Default)	HT - Horizontal Tenon	BK - Black	T2S - Type 2S	XW - 2700K	BLS - Backlight Shield
		BZ - Bronze	00 - Dusk to dawn		BZ - Bronze	T2M - Type 2M	WW - 3000K	
		GY - Gray	02 - On at dusk > dim to 30% after 6 hours > off at dawn		GY - Gray	T3S - Type 3S	NW - 4000K	
		WH - White	09 - On at dusk > dim to 30% after 3 hours > brighten to 100% 1 hour before dawn > off at dawn		WH - White	T3M - Type 3M		
			TX0000X0000 - T=Real-time based lighting profile. X=Choose O for off, L for Low (30%) or M for Medium (50%) or B for Bright. 0000=choose event time between 00:00 and 23:59. Second event optional.			T4 - Type 4		
					T5 - Type 5			

**SCOPE OF WORK**

INSTALL FIRST LIGHT TECHNOLOGIES SOLAR LED FIXTURES ON 28' FLT POLES PER FIXTURE SCHEDULE AND LOCATED PER THIS PLAN.

**ENGINEER'S NOTE:**

THIS DESIGN, INCLUDING THE LIGHT LOCATIONS AND PHOTOMETRY, IS ONLY INTENDED TO BE USED WITH FIRST LIGHT TECHNOLOGIES PRODUCTS, AS SPECIFIED. THIS PLAN IS NOT TO BE USED FOR INSTALL OF ANY OTHER PRODUCT WITHOUT WRITTEN APPROVAL OF THE ENGINEER OF RECORD OF THIS PLAN.

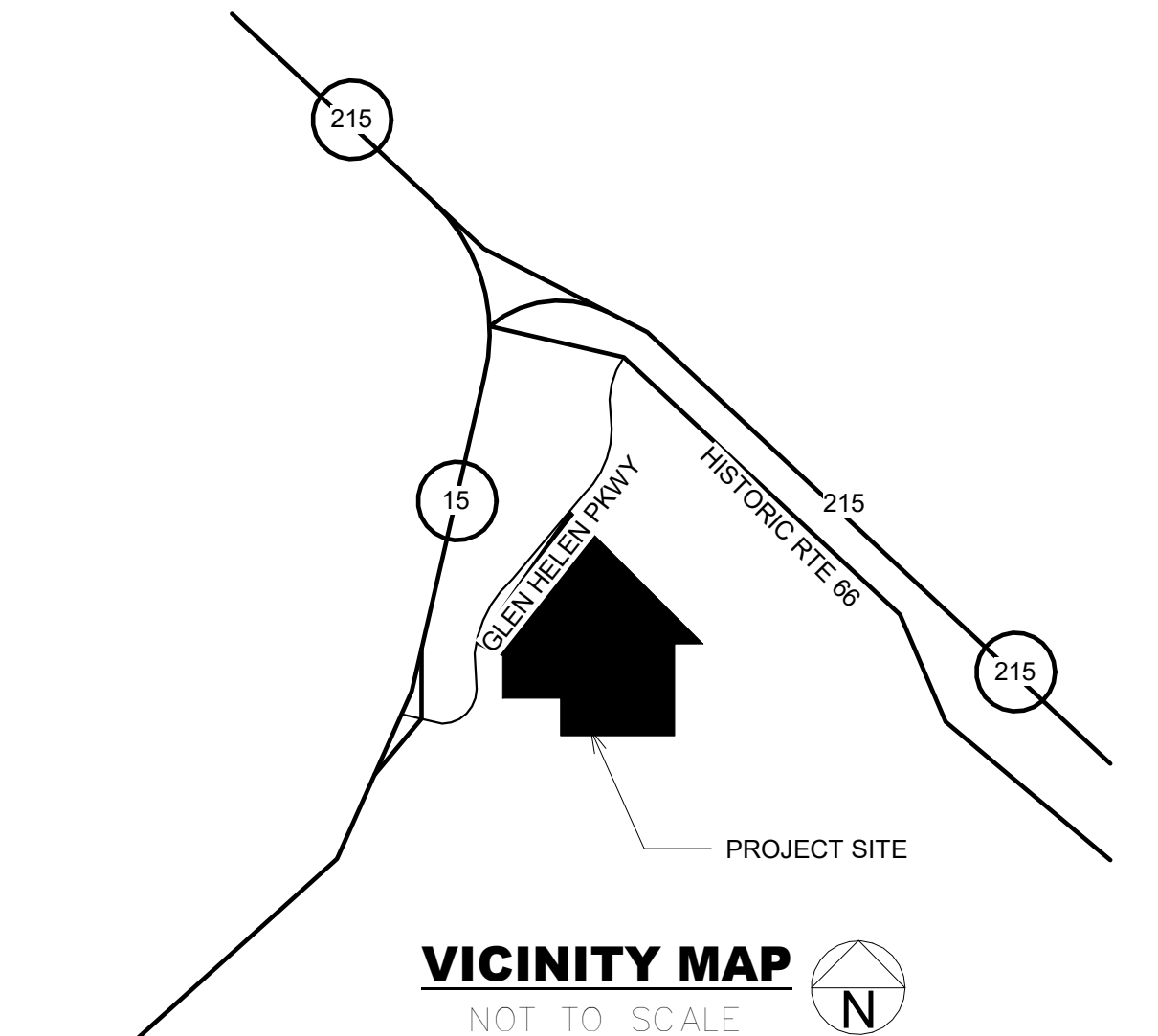
**KEY MAP**

SCALE: 1" = 200'

# GLEN HELEN REGIONAL PARK

## SITE LIGHTING PLAN

### FIRST LIGHT DESIGN



**PLAN INDEX**

TITLE SHEET	1 OF 4
SITE LIGHTING	2 OF 4
SITE LIGHTING	3 OF 4
SITE LIGHTING	4 OF 4

**PHOTOMETRIC RESULTS**

PHOTOMETRIC RESULTS OBTAINED USING A LLF OF 0.9.

CALCULATION SURFACE	AVERAGE
GLEN HELEN PARK RD	0.83 FC
LOT 1	1.13 FC
LOT 2	1.09 FC
LOT 3	1.06 FC
LOT 4	1.29 FC
LOT 5	1.18 FC

**LUMINAIRE SCHEDULE**

SYM.	TYPE	MANUFACTURER	FIXTURE	POLE	LUMENS	CONNECTED LOAD	MOUNTING HEIGHT	QTY
	A	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 2 DISTRIBUTION	ALUMINUM BY FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	44
	B	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 2 DISTRIBUTION	ALUMINUM BY FIRST LIGHT TECHNOLOGIES	7030	0 W	28'	9
	C	FIRST LIGHT TECHNOLOGIES	SINGLE: BFL-TYPE 4 DISTRIBUTION	ALUMINUM BY FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	32
	D	FIRST LIGHT TECHNOLOGIES	TWIN: BFL-TYPE 4 DISTRIBUTION	ALUMINUM BY FIRST LIGHT TECHNOLOGIES	6660	0 W	28'	13
	E	FIRST LIGHT TECHNOLOGIES	TWIN: BFL-4FT ARM TYPE 4 DISTRIBUTION	ALUMINUM BY FIRST LIGHT TECHNOLOGIES	7030	0 W	28'	7

ALL SUBSTITUTIONS MUST BE APPROVED IN WRITING BY ENGINEER OF RECORD, EEOR, MINIMUM (10) TEN DAYS PRIOR TO BID. FIXTURE CUT SHEETS, IES FILES, AND FULL PHOTOMETRIC CALCULATIONS REQUIRED FOR EVALUATION OF SUBSTITUTION BY EEOR.

**NOTICE TO CONTRACTORS**

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY THE SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED IN FIELD BY THE CONTRACTOR, SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ANY UTILITY FACILITIES SHOWN AND ANY OTHER FACILITIES NOT ON RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE INVITING BIDS" OF THE BID DOCUMENTS.

**PRIVATE ENGINEER'S STATEMENT OF RESPONSIBILITY**

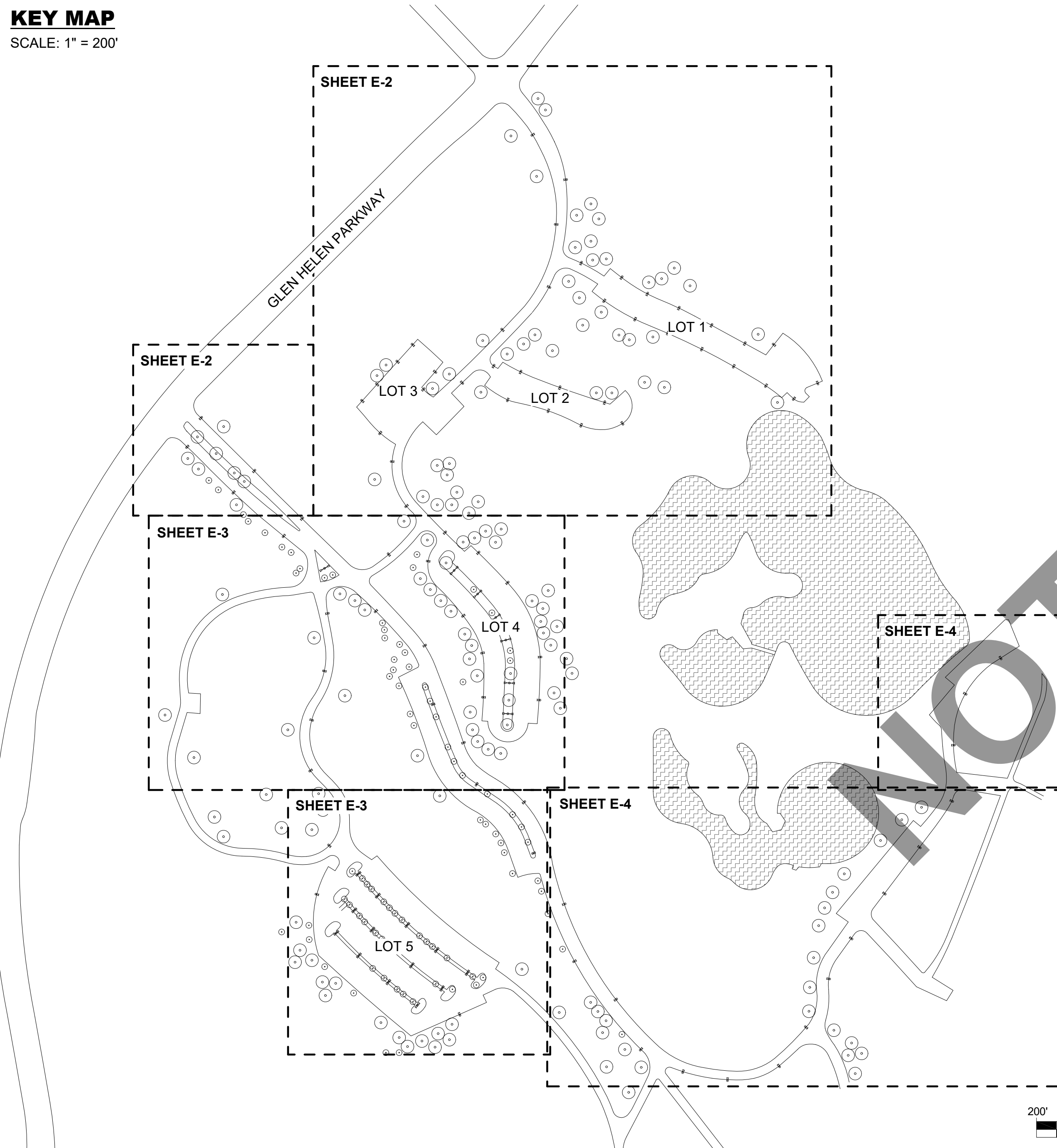
THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR THE ACCURACY AND ACCEPTABILITY OF THE WORK HEREIN. IN THE EVENT OF DISCREPANCIES ARISING DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY OF SAN BERNARDINO.

NAME: ANTHONY WINSTON III LICENSE NO. E-20881  
 EXP. DATE: 9-30-2024 DATE: 8-8-2024

ENGINEER'S CERTIFICATION  
 THE REGISTERED PROFESSIONAL ENGINEER CERTIFIES THAT THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH THE COUNTY OF SAN BERNARDINO ENGINEERING DESIGN GUIDELINES, POLICIES, AND PROCEDURES.

DECLARATION OF ENGINEER OF RECORD  
 I HEREBY DECLARE THAT IN MY PROFESSIONAL OPINION THE DESIGN OF THE IMPROVEMENTS AS SHOWN ON THESE PLANS COMPLIES WITH THE CURRENT PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES AS THE ENGINEER IN RESPONSIBLE CHARGE OF THE DESIGN OF THESE IMPROVEMENTS. I ACCEPT FULL RESPONSIBILITY FOR SUCH DESIGN. I UNDERSTAND AND ACKNOWLEDGE THAT THE PLAN CHECK OF THESE PLANS BY THE COUNTY OF SAN BERNARDINO IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THAT THESE PLANS COMPLY WITH THE COUNTY STANDARDS/PROCEDURES AND OTHER APPLICABLE CODES AND ORDINANCES. THE PLAN REVIEW PROCESS IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS, AND PLAN CHECK DOES NOT RELIEVE ME OF MY RESPONSIBILITY.

NAME: ANTHONY WINSTON III LICENSE NO. E-20881  
 EXP. DATE: 9-30-2024 DATE: 8-8-2024



BASIS OF BEARINGS:	BENCH MARK:
THE BASIS OF BEARINGS OF THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM CC383, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "P474", "P478", AND "D55C" NAD 83 (2011) EPOCH 2010.00 AS SHOWN HEREON. ALL BEARINGS SHOWN ON THIS MAP ARE GRID QUOTED BEARINGS AND DISTANCES FROM REFERENCE MARK OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES SHOWN ARE GRID DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A COMBINATION FACTOR OF 0.99993292. CALCULATIONS ARE MADE AT 1"=1600' L.S. 5389'. FLUSH PER CR 2020-0084 WITH COORDINATES OF: N: 228516; 1200000; E: 626663; 32600000 USING AN ELEVATION OF 1500.930.	M-32 1" IRON PIPE AND TAG AND MARKED COUNTY SURVEYOR IN A HANCOCK MONUMENT, INTERSECTION OF PERRIS BOULEVARD AND IRIS AVENUE, 58.55 FEET SOUTHWEST OF A CHIEFED 7" IN A 9" IRON CORNER POST, 40.88 FEET NORTH EAST OF NAL AND TAG IN THE WEST SIDE POWER POLE NO. 21338, 34.36 FEET NORTHWEST OF ANAL AND TAG SET IN SOUTHWEST SIDE OF TELEPHONE POLE NO. 15160. ELEVATION: 1503.526 NGVD 1929

COUNTY OF SAN BERNARDINO APPROVALS			
APPROVED BY:	DATE:	BY:	RECOMMENDED:
			CAPITAL PROJECTS DIVISION MANAGER
			DATE:
			APPROVED:
			CITY TRAFFIC ENGINEER
			DATE:
			PUBLIC WORKS DIRECTOR/CITY ENGINEER
			DATE:
DESIGNED BY: H.LOVE	DRAWN BY: H.LOVE	CHECKED BY: J.LOVE	

INTELLIGENT LIGHTING SYSTEMS Intelligent Lighting Systems Design + Procurement	PREPARED UNDER SUPERVISION OF ANTHONY WINSTON III RCE: E-20881 DATE: 8-8-2024	ENGINEER OF RECORD'S SEAL ANTHONY WINSTON III ELECTRICAL STATE OF CALIFORNIA
--	--	---

FIRST LIGHT DESIGN GLEN HELEN REGIONAL PARK SITE LIGHTING PLAN 2555 GLEN HELEN PKWY SAN BERNARDINO, CA 92407	ACCT No XXXX-70-XXXX SHEET E-1 OF 4 PROJECT No XXX XXXX
--	---

GLEN HELEN PARKWAY

GLEN HELEN PARK ROAD

LOT 3

LOT 2

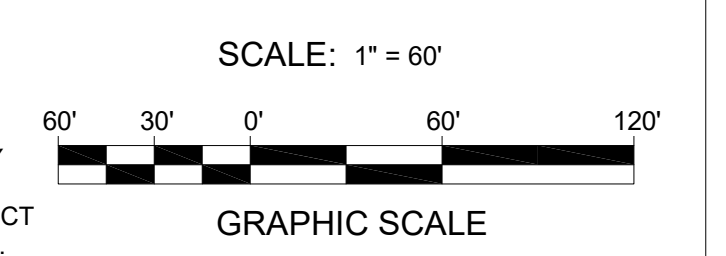
LOT 1

**SHEET NOTES**

1. INSTALL CONCRETE BASE FOR SOLAR LIGHT PER APPROVED STRUCTURAL DETAIL SHEET E-4.

MATCHLINE: THIS SHEET- ABOVE RIGHT

MATCHLINE: THIS SHEET- BELOW LEFT



THIS DESIGN, INCLUDING THE LIGHT LOCATIONS AND PHOTOMETRY, IS ONLY INTENDED TO BE USED WITH FIRST LIGHT TECHNOLOGIES PRODUCTS, AS SPECIFIED. THIS PLAN IS NOT TO BE USED FOR INSTALL OF ANY OTHER PRODUCT WITHOUT WRITTEN APPROVAL OF THE ENGINEER OF RECORD OF THIS PLAN.

NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF ANY CHANGES TO THIS PLAN.  
**DIGALERT**  
 CALL 811 or 1-800-422-4133  
 2 Working Days Before You Dig  
 WWW.CALL811.COM

BASIS OF BEARINGS:	BENCH MARK:

MARK	REVISIONS	APPR	DATE

DESIGNED BY H.LOVE DRAWN BY H.LOVE CHECKED BY J.LOVE

**COUNTY OF SAN BERNARDINO APPROVALS**

APPROVED BY	DATE	BY	RECOMMENDED:	DATE
			CAPITAL PROJECTS DIVISION MANAGER	
			APPROVED:	DATE
			CITY TRAFFIC ENGINEER	
			SENIOR ENGINEER	
			PUBLIC WORKS DIRECTOR/CITY ENGINEER	

**INTELLIGENT LIGHTING SYSTEMS**  
 Intelligent Lighting Systems  
 Design + Procurement  
 877 W. 4TH STREET STE. A  
 BEAUMONT, CA 92223  
 TEL: (708)554-0101  
 EMAIL: Sales@LightingSystems.com

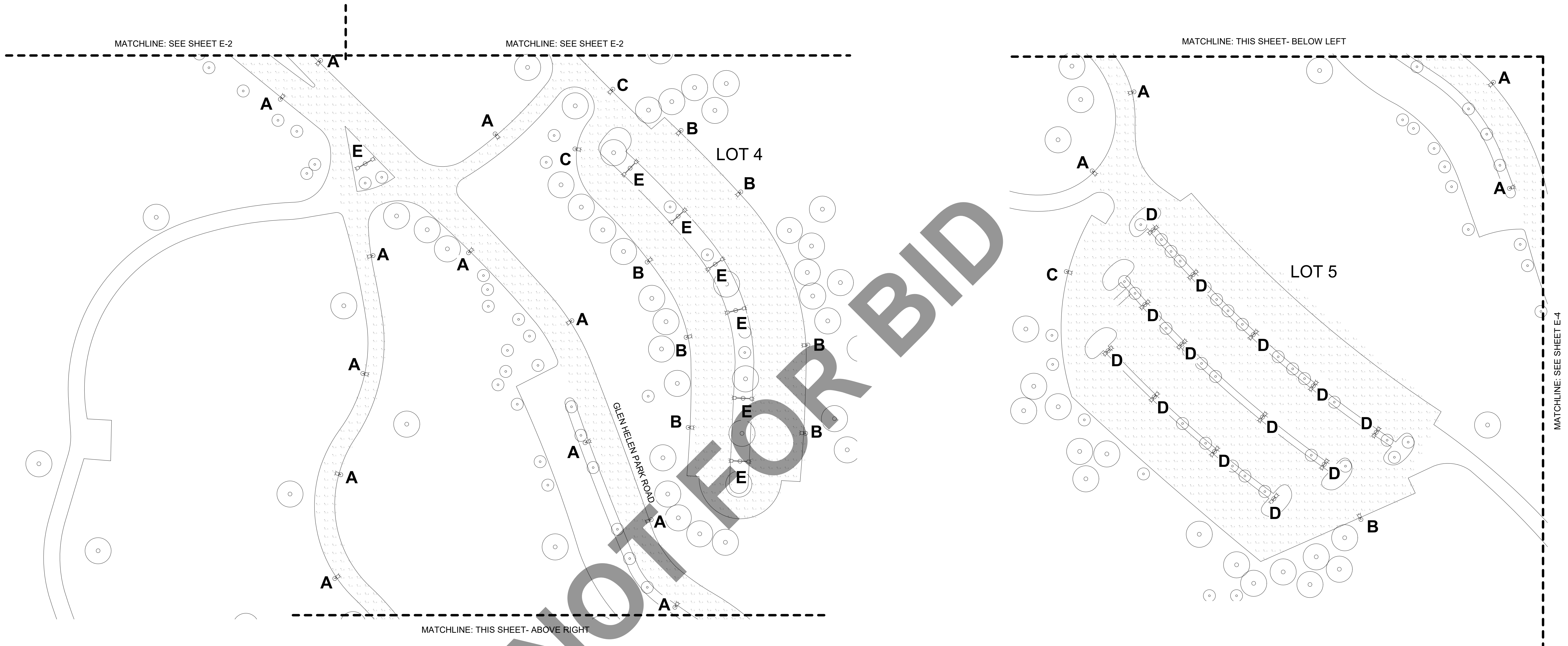
PREPARED UNDER SUPERVISION OF  
 ANTHONY WINSTON III  
 RCE: E-20881  
 8-8-2024  
 DATE



**FIRST LIGHT DESIGN**  
 GLEN HELEN REGIONAL PARK  
 SITE LIGHTING PLAN  
 2555 GLEN HELEN PKWY  
 SAN BERNARDINO, CA 92407

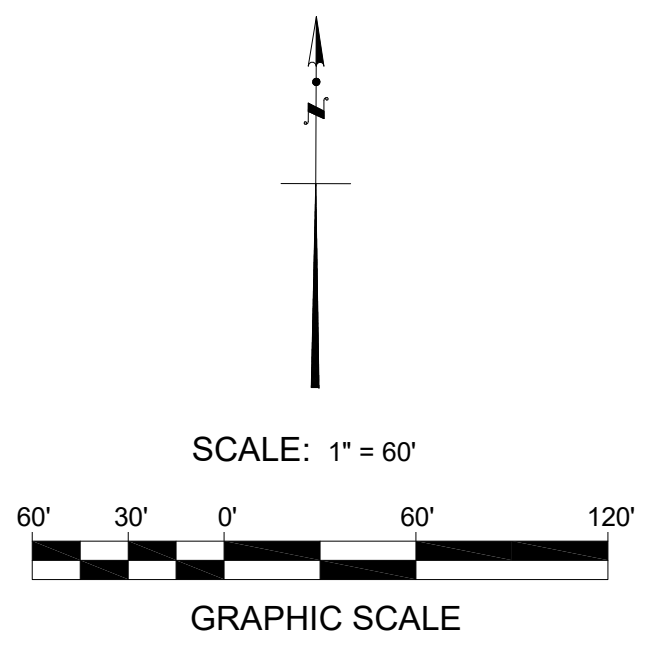
ACCT No XXXX-70-77-XXXX  
 SHEET **E-2** OF 4  
 PROJECT No XXX XXXX

**NOT FOR BID**



**SHEET NOTES**

- INSTALL CONCRETE BASE FOR SOLAR LIGHT PER APPROVED STRUCTURAL DETAIL ON SHEET E-4.



THIS DESIGN, INCLUDING THE LIGHT LOCATIONS AND PHOTOMETRY, IS ONLY INTENDED TO BE USED WITH FIRST LIGHT TECHNOLOGIES PRODUCTS, AS SPECIFIED. THIS PLAN IS NOT TO BE USED FOR INSTALL OF ANY OTHER PRODUCT WITHOUT WRITTEN APPROVAL OF THE ENGINEER OF RECORD OF THIS PLAN.



BASIS OF BEARINGS:	BENCH MARK:

MARK	REVISIONS	APPR	DATE

COUNTY OF SAN BERNARDINO APPROVALS			
APPROVED BY:	DATE:	BY:	RECOMMENDED:
			CAPITAL PROJECTS DIVISION MANAGER
			DATE:
			APPROVED:
			CITY TRAFFIC ENGINEER
			DATE:
			PUBLIC WORKS DIRECTOR/CITY ENGINEER
			DATE:

INTELLIGENT LIGHTING SYSTEMS  
  
 877 W. 4TH STREET STE. A  
 BEAUMONT, CA 92223  
 TEL: (708)554041  
 EMAIL: Sales@LightingSystems.com

PREPARED UNDER SUPERVISION OF  
  
 ANTHONY WINSTON III  
 RCE: E-20881  
 DATE: 8-8-2024

ENGINEER OF RECORD'S SEAL

FIRST LIGHT DESIGN  
 GLEN HELEN REGIONAL PARK  
 SITE LIGHTING PLAN  
 2555 GLEN HELEN PKWY  
 SAN BERNARDINO, CA 92407

ACCT No XXXX-70-77-XXXX
SHEET <b>E-3</b> OF <b>4</b>
PROJECT No XXX XXXX

