COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF KENTUCKY UTILITIES COMPANY FOR AN ADJUSTMENT OF ITS ELECTRIC RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCREDIT	))))))))))	**CASE NO. 2020-00349**

RESPONSE OF
KENTUCKY UTILITIES COMPANY
TO
LEXINGTON-FAYETTE URBAN COUNTY
GOVERNMENT'S FIRST REQUEST FOR INFORMATION TO
KENTUCKY UTILITIES
DATED JANUARY 8, 2021

FILED: JANUARY 22, 2021

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Daniel K. Arbough**, being duly sworn, deposes and says that he is Treasurer for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Daniel K. Arbough

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Lonnie E. Bellar**, being duly sworn, deposes and says that he is Chief Operating Officer for Louisville Gas and Electric Company and Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Lonnie E. Bellar

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Kent W. Blake**, being duly sworn, deposes and says that he is Chief Financial Officer for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Kent W. Blake

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy**, being duly sworn, deposes and says that he is Vice President, State Regulation and Rates, for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Christopher M. Garrett**, being duly sworn, deposes and says that he is Controller for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

DocuSigned by:
Christopher M. Garrett
5B353C6395DE4D7...
Christopher M. Garrett

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Eileen L. Saunders**, being duly sworn, deposes and says that she is Vice President, Customer Services for Louisville Gas and Electric Company and Kentucky Utilities Company and an employee of LG&E and KU Services Company, and that she has personal knowledge of the matters set forth in the responses for which she is identified as the witness, and the answers contained therein are true and correct to the best of her information, knowledge and belief.

Eileen L. Saunders

Eileen L. Saunders

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of January 2021.

Venitta Michelle McCreary

Notary Public

Notary Public ID No. KYNP45977

My Commission Expires:

April 1, 2024

VERIFICATION

COMMONWEALTH OF NORTH CAROLINA)
)
COUNTY OF BUNCOMBE)

The undersigned, **William Steven Seelye**, being duly sworn, deposes and states that he is a Principal of The Prime Group, LLC, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

William Steven Seelye

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 16 day of January 2021.

_____(SEAL)
Notary Public

Notary Public ID No. _____

My Commission Expires:
9/22/2021

Ryan Meagher
Notary Public
Henderson County, NC
My Commission Expires 9/22/25

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **David S. Sinclair**, being duly sworn, deposes and says that he is Vice President, Energy Supply and Analysis for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of January 2021.

Notary Public

Notary Public, ID No. 603967

My Commission Expires:

July 11, 2022

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **John K. Wolfe**, being duly sworn, deposes and says that he is Vice President, Electric Distribution for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

John K. Wolfe

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 18th day of January 2021.

Notary Public

Notary Public ID No. 603967

My Commission Expires:

July 11, 2022

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 1

Responding Witness: William Steven Seelye

Q-1. Please refer to Exhibit WSS-4:

a. Please provide a comprehensive breakdown of the Total Installed Cost for each LED lighting offering.

b. Please explain how LG&E or Mr. Seelye calculated the Fixed Carrying Charge.

c. Please explain the justification for the Fixed Carrying Charge.

d. Please provide all work papers supporting the estimated investment per unit for each type of LED fixture and underground pole.

A-1.

a. See the response to PSC 2-118(a).

b. See the response to PSC 2-118(b).

c. The Fixed Carrying Charge allows for the recovery of property taxes, income taxes, depreciation, and a rate of return.

d. See the response to PSC 2-118(a).

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 2

Responding Witness: William Steven Seelye

Q-2. Please refer to Exhibit WSS-5.

a. Explain how the Company estimated the NBV for Poles.

b. Explain how the Company estimated the NBV for Fixtures.

c. Explain how and provide the calculation on how the Company determined the NBV per fixture.

d. Please provide detail to support the answer to "c".

e. Please provide detail to support the "salvage portion" of conversion fee, which is identified as $3.29 for KU and $4.62 for LG&E.

f. Please provide detail to support the "revenue portion" of conversion fee, which is identified as $1.72 for KU and $2.46 for LG&E.

g. What is the "salvage portion" and "revenue portion" of the Annual Conversion fee?

h. Please provide a breakdown of the remaining costs for both annual and monthly conversion fees.

i. Provide all work papers to support the information provided in Exhibit WSS-5.

A-2.

a. The Company uses current costs to calculate the total investment in fixtures and poles. The actual 2019 NBV (net book value after depreciation) is allocated between fixtures and poles based on the investment calculated using current cost.

b. See the response to part (a).

c. See attached.

d. See the response to part (c).

e. The salvage portion of the charge, which is credited against plant, is calculated based on the depreciation portion of the carrying charge which is the depreciation rate of 20% multiplied by the NBV per fixture divided by 12 months.

f. The revenue portion is a component of the carrying charge rate excluding depreciation.

g. The salvage portion represents the salvage value of the fixture, whereas the revenue portion is booked as revenue.

h. The Companies have not performed the requested analysis.

i. See the response to part (c).

KU Spend		Capital NEW BUSINESS/STREET LIGHTING	REPAIR / REPLACE DEF ST LIGHTING	Capital Total	OM REPAIR / REP DEF ST LIGHTING	OM Total	Grand Total	Annual Non-Fix Maintenance per pole
	2017	$ 3,876,402	$ 3,111,105	$ 6,987,508	$ 553,896	$ 553,896	$ 7,541,404	$ -
	2018	$ 3,331,742	$ 3,182,958	$ 6,514,701	$ 499,284	$ 499,284	$ 7,013,985	$ -
	2019	$ 3,796,529	$ 4,349,018	$ 8,145,547	$ 568,604	$ 568,604	$ 8,714,151	$ -
							Average	$ -
Forcasted test year		$ 4,467,051	$ 4,957,331		$ 467,585			$ 2.71

Average bulb and PEC cost (burdened)	$	14.54
Estimated labor cost / bulb (burdened)	$	55.61
	$	70.14
Average HID fixture cost (burdened)	$	229.65
Estimated labor cost / bulb (burdened)	$	62.00
	$	291.65

		Fixtures replaced	Fix Replace Cost		
	2017	1339	$ 291.65	$ 390,519.35	
	2018	1636	$ 291.65	$ 477,139.40	
	2019	1520	$ 291.65	$ 443,308.00	
Average					

KU lights	172,819	94.90%
ODP Lights	9290	5.10%

KU				
Total fixture	172,819		Weighted average invest per unit	
OH Fixtures	127,820	74%	Avg OH Fix Invest per unit	$ 516.68
UG Fixtures	44,999	26%	Avg UG Fixture Invest Per Unit	$ 310.74
			Avg UG Pole Invest Per Unit	$ 2,032.66
				$ 2,343.40

	New Bus Cap poles NBV		Calculated Present day NBV
KU	$ 1,008,904.86		OH Fix $ 66,042,037.60
			UG Fix $ 13,983,075.81
			Poles $ 92,227,794.91
	Pole Replacement NBV per year		Total $ 172,252,908.32
KU	$ 47.27		Total Fix $ 80,025,113.41

	Per Month	Estimated NBV	
Excess Facilities	114,159.16	$ 9,841,306.90	
Excess Facilities CIAC	9,738.37	$ 2,071,993.62	

	2020 NBV	$	73,343,106.33
53.54%	Poles NBV	$	39,269,426.76
	NBV / pole	$	872.67
46.46%	Fix NBV	$	34,073,679.56
	NBV / fix	$	197.16
Annual Converison Fee		$	60.11
Monthly Conversion Fee		$	5.01

KU	Pole Type	Present Day Invest Per Unit	# of Poles	Calculated Present day NBV	% of total calcualted present day pole NBV	NBV per pole type	New Bus NBV per pole type	Replacement NBV per year	Adjusted Invest per unit	Annual Non-Fix Maintenance per pole
	Post Top - Decorative Smooth	$ 1,485.30	7,633	$ 11,337,303.69	12.29%	$ 4,823,529.91	$ 124,021.84	$ -	**$ 641.21**	$ 2.71
	Post Top - Historic Fluted	$ 2,509.79	1,589	$ 3,988,059.97	4.32%	$ 1,696,746.16	$ 43,626.47	$ -	**$ 1,083.67**	$ 2.71
	Contemporary	$ 2,014.28	11,598	$ 23,361,596.15	25.33%	$ 9,939,343.68	$ 255,558.84	$ -	**$ 869.50**	$ 2.71
	Cobra	$ 2,180.62	24,553	$ 53,540,835.09	58.05%	$ 22,779,298.03	$ 585,697.72	$ -	**$ 941.30**	$ 2.71
			45,373	$ 2,032.66			New Bus number of poles			
							83			
							17			
							127			
							269			
							496			

Case No. 2020-00349
Attachment to Response to LFUCG-1 Question No. 2c
Page 1 of 1
Seelye

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 3

Responding Witness: John K. Wolfe

Q-3. Does KU, LG&E, or its corporate affiliates receive any form of rebates or reimbursement from LED manufactures, distributors, or retailers? If so, how and where is that revenue booked?

A-3. No.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 4

Responding Witness: John K. Wolfe

Q-4. Does the Company track expenses for new installation separate from repairs and the type of repair be known (e.g. problem related to wiring, fixture, pole, etc.)? Why or why not?

A-4. Yes. New installations are charged to a New Business Streetlighting Budget. Repairs are charged to a capital or O&M Repair/Replace Defective Streetlighting Budget. Expenses are tracked in this manner in order to distinguish new business work from repair work, capital work from O&M work, to aid in budgeting, and is a generally accepted good business practice.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 5

Responding Witness: John K. Wolfe

Q-5. For the period after September 2018 to the present, please provide any Company internal and external business plans, presentations, marketing material, feasibility studies, lighting conversion financial analyses, customer economic studies, conversion financial models, and correspondence to senior leadership as created or prepared by or for the Company as it relates to street lighting. Bookmark the following documents in your response:

a. Technical specifications or metrics established by the Company that were used to select LED lighting types, such as lumen output, lumens-per-watt, warranty, L70, kelvin, etc.

b. Product data sheets for the new LED lighting offerings and LED equipment supply options.

A-5. See attached.

GE Evolve™

LED Roadway Lighting

ERL1-ERLH-ERL2

current
powered by GE

GE Evolve™
LED Roadway Lighting
ERL1-ERLH-ERL2

The **Evolve** LED Roadway Luminaire is optimized for customers requiring a LED solution for local, collector and major roadways. GE's unique reflective optics are designed to optimize application efficiency and minimize glare. The modern design incorporates the heat sink directly into the unit for heat transfer to prolong LED life. This reliable unit has a 100,000 hour design life, significantly reducing maintenance needs and expense over the life of the fixture. This efficient solution lowers energy consumption compared to a traditional HID fixture for additional operating cost savings.

Features:

- Optimized roadway photometric distributions
- **Evolve**™ light engine consisting of reflective technology designed to optimize application efficiency and minimize glare
- 70 CRI at 2700K, 3000K and 4000K typical.
- –40°C to 50°C UL Ambient Typical.
- ULOR = 0 (zero uplight)
- Designed & Assembled in USA

Applications:

- Local Roadways
- Collector Roadways
- Major Roadway/Streets

Compatible with **LightGrid**™ Outdoor Wireless Control System

To learn more about **GE Evolve LED Roadway Lighting**, go to: **www.currentbyge.com**

GE Evolve™
LED Roadway Lighting
ERL1-ERLH-ERL2

Project name _____
Date _____
Type _____

Typical Specifications: ERL1-ERLH-ERL2

LED & Optical

- **Output Range:** 1900 – 30000 lm
- **Photometric Options:** Type II Narrow, Type II Wide, Type III, Type IV
- **System Efficacy:** 100 - 145 LPW
- **CCT:** 2700K, 3000K, 4000K; High brightness LEDs @ 70 CRI

Lumen Maintenance Tables

Projected Lxx per IES TM-21 at 25°C for reference:

ERL1 LUMEN OUTPUT CODES	LXX(10K)@HOURS 25,000 HR	50,000 HR	100,000 HR
02,03,04,05,06	L96	L95	L91
07,08,09	L95	L91	L84
10	L89	L80	L64

ERLH LUMEN OUTPUT CODES	LXX(10K)@HOURS 25,000 HR	50,000 HR	100,000 HR
10, 11	L97	L96	L94
13, 14	L95	L93	L88
15, 16	L94	L91	L85

ERL2 LUMEN OUTPUT CODES	LXX(10K)@HOURS 25,000 HR	50,000 HR	100,000 HR
16, 18, 19, 21, 23	L96	L94	L91
25, 27, 28	L95	L93	L88
30	L95	L93	L87

Note: Projected Lxx based on LM80 (10,000 hour testing). DOE Lighting Facts Verification Testing Tolerances apply to initial luminous flux and lumen maintenance measurements.

Electrical

- **Input Voltage:** 120-277 volt and 347-480 volt
- **Input Frequency:** 50/60Hz
- **Power Factor (PF)*:** >90%
- **Total Harmonic Distortion (THD)*:** <20%

**Power factor and THD tolerance exceptions: ERL1 "02" Lumen output: PF and THD within tolerances above only at 120 volt. ERL1 "03" Lumen output: @120 volt PF~0.89; @ 480 volt THD~26% ERL1 "04" Lumen output: @480 volt THD~22%*

Ratings

- **Surge Protection:** per ANSI C136.2-2015:
  (Driver Internal):
  - 6kV/3kA "Basic: (120 Strikes)" - Standard on ERL1 (02-06)
  - 10kV/5kA "Enhanced: (40 Strikes)" - Standard on ERL1 (07 - 10), ERLH, ERL2

  (Additional Separate Secondary SPD)
  - 10kV/5kA "Enhanced: (40 Strikes) - Option "R"
  - 20kV/10kA "Elevated" (40 Strikes) - Option "T"
- **Safety:** UL/cUL Listed. UL 1598 listed, suitable for wet locations
- **Environmental:** Compliant with the materials restrictions of RoHS
- **EMI:** Title 47 CFR Part 15 Class A
- **Vibration:** 3G per ANSI C136.31-2010
- LM-79 testing in accordance with IESNA Standards
- Std. Optical enclosure rated per ANSI C136.25-2009:
  — ERL1/ERLH/ERL2 = IP65, Optional: IP66
- **Operating Temperature:**

PRODUCT ID	LUMEN OUTPUT	AMBIENT READING
ERL1	02-10	-40°C to 50°C
ERLH	10-11, 13	-40°C to 50°C
ERLH	14-16	-40°C to 45°C
ERL2	16-28	-40°C to 50°C
ERL2	30	-40°C to 45°C

Delayed start may be experienced < -35°C

Construction & Finish

- **Housing:**
  — Die Cast Enclosure
  — Casting-integral heat sink for maximum heat transfer
- **Lensing:** Impact resistant tempered glass, standard
- **Paint:** Corrosion resistant polyester powder painted, minimum 2.0 mil. thickness.
  — Standard Colors: Dark Bronze, Black, & Gray
  — RAL & custom colors available
  — Optional coastal finish available.
- **Weight:** 12.4lbs (5.6kg) – 24lbs (10.9kg)

Warranty

- **System Warranty:** 5 Year Standard, 10 Year Optional

Controls

- **Dimming:**
  — Standard: 0-10V; Optional: DALI (120-277V Only)
- **Sensors:**
  — Photo electric sensors (PE) available.
- LightGrid™ compatible

Mounting

- Slipfitter with +/- 5 degree of adjustment for leveling.
- Integral die cast mounting pipe stop.
- Adjustable for 1.25 in. or 2 in. mounting pipe.

Suggested HID Replacement Lumen Levels

- ~4,000–5,000 lumens to replace 100W HPS Cobra-head
- ~7,000–8,800 lumens to replace 150W HPS Cobra-head
- ~8,500–11,500 lumens to replace 200W HPS Cobra-head
- ~11,500–14,000 lumens to replace 250W HPS Cobra-head
- ~21,000–30,000 lumens to replace 400W HPS Cobra-head

Note: Actual replacement lumens may vary based upon mounting height, pole spacing, design criteria, etc.

CONVERSION FROM PREVIOUS GENERATION OPTICS TO CURRENT GENERATION OPTICS** PREVIOUS	DESCRIPTION	CURRENT	DESCRIPTION
A1, B1	Extra Narrow/Narrow Asymmetric	A3	Type II Narrow
C1, E1	Asymmetric Short/Medium	B3	Type II Wide
D1, G1	Asymmetric Forward/Extra Wide	C3	Type III
F1	Asymmetric Wide	D3	Type IV
		E3	Type II Enhanced Back Light

**The information above is designed to provide a guideline to select the correct luminaire for a roadway application. The best and most accurate way to ensure the proper design is do a lighting layout Utilizing AGI.

GE Evolve™
LED Roadway Lighting
ERL1-ERLH-ERL2

Project name _____
Date _____
Type _____

E R L 1 _ _ _ _ – _ _ _ _ _ _ _ _ – _ _ _ _ _ _ _

PROD. ID	VOLTAGE	LUMEN OUTPUT	DISTRIBUTION*	CCT	CONTROLS	COLOR	OPTIONS
E = Evolve **R** = Roadway **L** = Local **1** = Single Module	**0** = 120-277V* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* * Not available with Fusing. Must choose a discrete voltage with F option.	**02*** **03<** **04<** **05<** **06** **07** **08** **09** **10** See Table *120V only, not compatible with 0-10V dimming. < See Note Under Controls Column	**A3** = Type II Narrow **B3** = Type II Wide **C3** = Type III **D3** = Type IV **E3** = Type II Enhanced Back Light See Table *Nominal IES Type classing subject to typical variation, individual units may differ.	**27** = 2700K<>**30** = 3000K**40** = 4000K <> Select 2700K or 3000K CCT for IDA approved units.	**A** = ANSI C136.41 7-pin **D** = ANSI C136.41 7-pin with Shorting Cap **E** = ANSI C136.41 7-pin with non-Dimming PE Control.* *PE Control Only available for 120-277V or 480V Discrete. Not available for 347-480V or 347V Discrete. < If dimming the 03 - 05 lumen output using a control supplied from a source other than GE call 1-888-694-3533, then select Option 2 at the prompt for assistance. **NOTE:** Dimming controls wired for 0-10V standard unless DALI option "U" requested.	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze	**A** = 4 Bolt Slipfitter † **F** = Fusing **G** = Internal Bubble Level **I** = IP66 Optical **L** = Tool-Less Entry **R** = Secondary 10kV/5kA SPD **U** = DALI Programmable +^ **X** = Single Package # **Y** = Coastal Finish * **XXX** = Special Options † Contact manufacturer for Lead-Time. # "X" option provides single pack box per fixture. Std Packaging = 20 units per Magna pak container. * Recommended for installations within 750 ft. from the coast. Contact Factory for Lead-Time. + Compatible with LightGrid 2.0 nodes. ^ Not available in 347V, 480V or 347-480V for Lumen Output Levels 07, 08, 09, and 10.

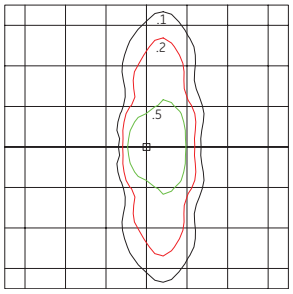
LUMEN OUTPUT	DISTRIBUTION	TYPICAL INITIAL LUMENS 4000K	3000K	2700K	TYPICAL SYSTEM WATTAGE 120-277V	347-480V	BUG RATING 4000K	3000K	2700K	IES FILE NUMBER 4000K 120-277V	347-480V	3000K 120-277V	347-480V	2700K 120-277V	347-480V
02	A3	2000	1900	1900	14	N/A	B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_02A340_-120VIES	N/A	ERL1_02A330_-120VIES	N/A	ERL1_02A327_-120VIES	N/A
	B3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_02B340_-120VIES	N/A	ERL1_02B330_-120VIES	N/A	ERL1_02B327_-120VIES	N/A
	C3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_02C340_-120VIES	N/A	ERL1_02C330_-120VIES	N/A	ERL1_02C327_-120VIES	N/A
	D3						B0-U0-G1	B0-U0-G1	B0-U0-G1	ERL1_02D340_-120VIES	N/A	ERL1_02D330_-120VIES	N/A	ERL1_02D327_-120VIES	N/A
	E3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_02E340_-120VIES	N/A	ERL1_02E330_-120VIES	N/A	ERL1_02E327_-120VIES	N/A
03	A3	3000	2900	2800	22	26	B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_03A340_-120-277VIES	ERL1_03A340_-347-480VIES	ERL1_03A330_-120-277VIES	ERL1_03A330_-347-480VIES	ERL1_03A327_-120-277VIES	ERL1_03A327_-347-480VIES
	B3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_03B340_-120-277VIES	ERL1_03B340_-347-480VIES	ERL1_03B330_-120-277VIES	ERL1_03B330_-347-480VIES	ERL1_03B327_-120-277VIES	ERL1_03B327_-347-480VIES
	C3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_03C340_-120-277VIES	ERL1_03C340_-347-480VIES	ERL1_03C330_-120-277VIES	ERL1_03C330_-347-480VIES	ERL1_03C327_-120-277VIES	ERL1_03C327_-347-480VIES
	D3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_03D340_-120-277VIES	ERL1_03D340_-347-480VIES	ERL1_03D330_-120-277VIES	ERL1_03D330_-347-480VIES	ERL1_03D327_-120-277VIES	ERL1_03D327–347-480VIES
	E3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_03E340_-120-277VIES	ERL1_03E340_-347-480VIES	ERL1_03E330_-120-277VIES	ERL1_03E330_-347-480VIES	ERL1_03E327_-120-277VIES	ERL1_03E327_-347-480VIES
04	A3	4000	3900	3800	31	34	B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_04A340_-120-277VIES	ERL1_04A340_-347-480VIES	ERL1_04A330_-120-277VIES	ERL1_04A330_-347-480VIES	ERL1_04A327_-120-277VIES	ERL1_04A327_-347-480VIES
	B3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_04B340_-120-277VIES	ERL1_04B340_-347-480VIES	ERL1_04B330_-120-277VIES	ERL1_04B330_-347-480VIES	ERL1_04B327_-120-277VIES	ERL1_04B327_-347-480VIES
	C3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_04C340_-120-277VIES	ERL1_04C340_-347-480VIES	ERL1_04C330_-120-277VIES	ERL1_04C330_-347-480VIES	ERL1_04C327_-120-277VIES	ERL1_04C327_-347-480VIES
	D3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_04D340_-120-277VIES	ERL1_04D340_-347-480VIES	ERL1_04D330_-120-277VIES	ERL1_04D330_-347-480VIES	ERL1_04D327_-120-277VIES	ERL1_04D327_-347-480VIES
	E3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_04E340_-120-277VIES	ERL1_04E340_-347-480VIES	ERL1_04E330_-120-277VIES	ERL1_04E330_-347-480VIES	ERL1_04E327_-120-277VIES	ERL1_04E327_-347-480VIES
05	A3	5000	4900	4700	39	43	B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_05A340_-120-277VIES	ERL1_05A340_-347-480VIES	ERL1_05A330_-120-277VIES	ERL1_05A330_-347-480VIES	ERL1_05A327_-120-277VIES	ERL1_05A327_-347-480VIES
	B3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_05B340_-120-277VIES	ERL1_05B340_-347-480VIES	ERL1_05B330_-120-277VIES	ERL1_05B330_-347-480VIES	ERL1_05B327_-120-277VIES	ERL1_05B327_-347-480VIES
	C3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_05C340_-120-277VIES	ERL1_05C340_-347-480VIES	ERL1_05C330_-120-277VIES	ERL1_05C330_-347-480VIES	ERL1_05C327_-120-277VIES	ERL1_05C327_-347-480VIES
	D3						B1-U0-G1	B1-U0-G1	B1-U0-G1	ERL1_05D340_-120-277VIES	ERL1_05D340_-347-480VIES	ERL1_05D330_-120-277VIES	ERL1_05D330_-347-480VIES	ERL1_05D327_-120-277VIES	ERL1_05D327_-347-480VIES
	E3						B2-U0-G2	B1-U0-G1	B1-U0-G1	ERL1_05E340_-120-277VIES	ERL1_05E340_-347-480VIES	ERL1_05E330_-120-277VIES	ERL1_05E330_-347-480VIES	ERL1_05E327_-120-277VIES	ERL1_05E327_-347-480VIES
06	A3	6000	5800	5700	47	52	B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_06A340_-120-277VIES	ERL1_06A340_-347-480VIES	ERL1_06A330_-120-277VIES	ERL1_06A330_-347-480VIES	ERL1_06A327_-120-277VIES	ERL1_06A327_-347-480VIES
	B3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_06B340_-120-277VIES	ERL1_06B340_-347-480VIES	ERL1_06B330_-120-277VIES	ERL1_06B330_-347-480VIES	ERL1_06B327_-120-277VIES	ERL1_06B327_-347-480VIES
	C3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_06C340_-120-277VIES	ERL1_06C340_-347-480VIES	ERL1_06C330_-120-277VIES	ERL1_06C330_-347-480VIES	ERL1_06C327_-120-277VIES	ERL1_06C327_-347-480VIES
	D3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_06D340_-120-277VIES	ERL1_06D340_-347-480VIES	ERL1_06D330_-120-277VIES	ERL1_06D330_-347-480VIES	ERL1_06D327_-120-277VIES	ERL1_06D327_-347-480VIES
	E3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_06E340_-120-277VIES	ERL1_06E340_-347-480VIES	ERL1_06E330_-120-277VIES	ERL1_06E330_-347-480VIES	ERL1_06E327_-120-277VIES	ERL1_06E327_-347-480VIES
07	A3	7000	6800	6600	58		B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_07A340____.IES		ERL1_07A330____.IES		ERL1_07A327____.IES	
	B3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_07B340____.IES		ERL1_07B330____.IES		ERL1_07B327____.IES	
	C3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_07C340____.IES		ERL1_07C330____.IES		ERL1_07C327____.IES	
	D3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_07D340____.IES		ERL1_07D330____.IES		ERL1_07D327____.IES	
	E3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_07E340____.IES		ERL1_07E330____.IES		ERL1_07E327____.IES	
08	A3	8000	7800	7600	71		B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_08A340____.IES		ERL1_08A330____.IES		ERL1_08A327____.IES	
	B3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_08B340____.IES		ERL1_08B330____.IES		ERL1_08B327____.IES	
	C3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_08C340____.IES		ERL1_08C330____.IES		ERL1_08C327____.IES	
	D3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_08D340____.IES		ERL1_08D330____.IES		ERL1_08D327____.IES	
	E3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_08E340____.IES		ERL1_08E330____.IES		ERL1_08E327____.IES	
09	A3	9000	8800	8500	84		B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_09A340____.IES		ERL1_09A330____.IES		ERL1_09A327____.IES	
	B3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_09B340____.IES		ERL1_09B330____.IES		ERL1_09B327____.IES	
	C3						B2-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_09C340____.IES		ERL1_09C330____.IES		ERL1_09C327____.IES	
	D3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_09D340____.IES		ERL1_09D330____.IES		ERL1_09D327____.IES	
	E3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_09E340____.IES		ERL1_09E330____.IES		ERL1_09E327____.IES	
10	A3	9800	9600	9250	97		B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_10A340____.IES		ERL1_10A330____.IES		ERL1_10A327____.IES	
	B3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_10B340____.IES		ERL1_10B330____.IES		ERL1_10B327____.IES	
	C3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_10C340____.IES		ERL1_10C330____.IES		ERL1_10C327____.IES	
	D3						B1-U0-G2	B1-U0-G2	B1-U0-G2	ERL1_10D340____.IES		ERL1_10D330____.IES		ERL1_10D327____.IES	
	E3						B2-U0-G2	B2-U0-G2	B2-U0-G2	ERL1_10E340____.IES		ERL1_10E330____.IES		ERL1_10E327____.IES	

Photometrics:

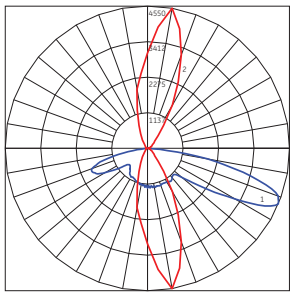
Evolve™ LED Streetlight (ERL1)

ERL1
Type II Narrow
(05A340)

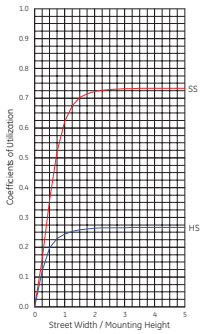
5,000 Lumens
4000K
ERL1_05A340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

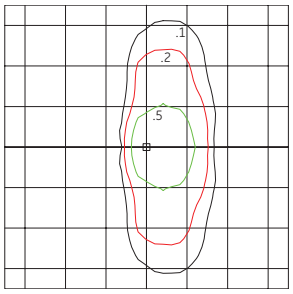


– Vertical plane through horizontal angle of Max. Cd at 80°
– Horizontal cone through vertical angle of Max. Cd at 67°

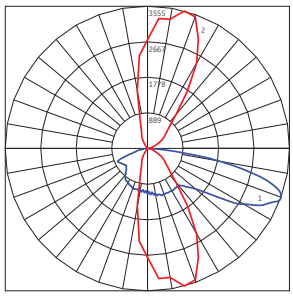


ERL1
Type II Wide
(05B340)

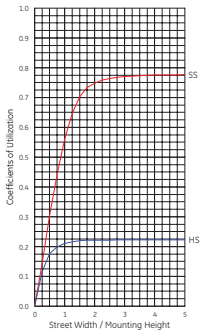
5,000 Lumens
4000K
ERL1_05B340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

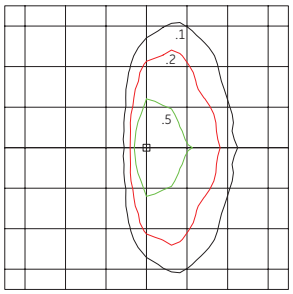


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 69°

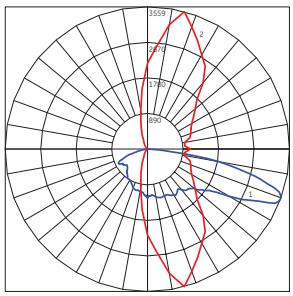


ERL1
Type III
((05C340)

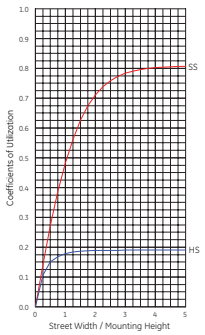
5,000 Lumens
4000K
ERL1_05C340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

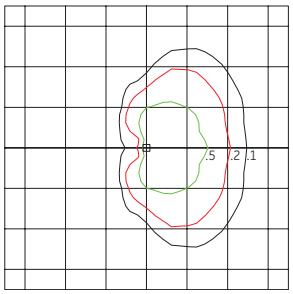


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 70°

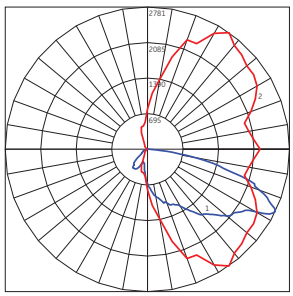


ERL1
Type IV
(05D340)

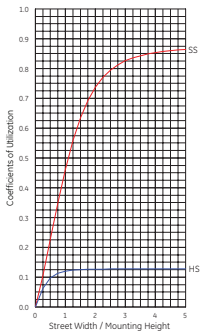
5,000 Lumens
4000K
ERL1_(05D340)___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

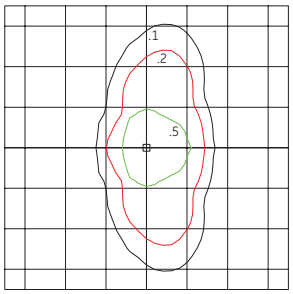


– Vertical plane through horizontal angle of Max. Cd at 55°
– Horizontal cone through vertical angle of Max. Cd at 64°

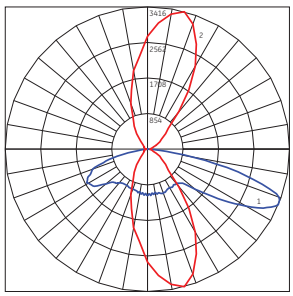


ERL1
Type II Enhanced Back Light
(05E340)

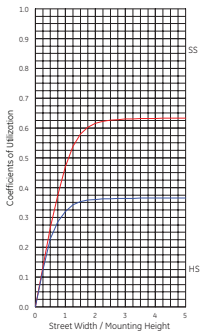
5,000 Lumens
4000K
ERL1_(05E340)___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade



– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 67°



GE Evolve™
LED Roadway Lighting
ERL1-ERLH-ERL2

Project name _____
Date _____
Type _____

E R L H _ _ _ _ – _ _ _ _ _ _ – _ _ _ _

PROD. ID	VOLTAGE	LUMEN OUTPUT	DISTRIBUTION*	CCT	CONTROLS	COLOR	OPTIONS
E = Evolve **R** = Roadway **L** = Local **H** = High Output	**0** = 120-277V* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* * Not available with Fusing. Must choose a discrete voltage with F option.	**10** **11** **13** **14** **15** **16** See Table	**A3** = Type II Narrow **B3** = Type II Wide **C3** = Type III **D3** = Type IV **E3** = Type II Enhanced Back Light See Table *Nominal IES Type classing subject to typical variation, individual units may differ.	**30** = 3000K<> **40** = 4000K <> Select 3000K CCT for IDA approved units.	**A** = ANSI C136.41 7-pin **D** = ANSI C136.41 7-pin with Shorting Cap **E** = ANSI C136.41 7-pin with non-Dimming PE Control.* *PE Control Only available for 120-277V or 480V Discrete. Not available for 347-480V or 347V Discrete. **NOTE:** Dimming controls wired for 0-10V standard unless DALI option "U" requested.	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze	**A** = 4 Bolt Slipfitter † **F** = Fusing **G** = Internal Bubble Level **I** = IP66 Optical **L** = Tool-Less Entry **R** = Secondary 10kV/5kA SPD **U** = DALI Programmable +^ **X** = Single Package # **Y** = Coastal Finish * **XXX** = Special Options † Contact manufacturer for Lead-Time. # "X" option provides single pack box per fixture. Std Packaging = 20 units per Magna pak container. * Recommended for installations within 750 ft. from the coast. Contact Factory for Lead-Time. + Compatible with LightGrid 2.0 nodes. ^ Not available in 347V, 480V or 347-480V.

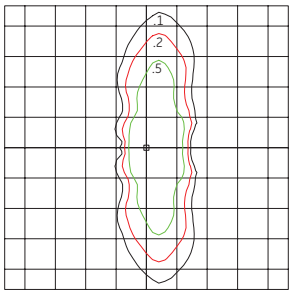
LUMEN OUTPUT	DISTRIBUTION	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 3000K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	BUG RATING 4000K	BUG RATING 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 3000K
10	A3	10000	9600	82	82	B2-U0-G2	B2-U0-G2	ERLH_10A340____.IES	ERLH_10A330____.IES
	B3					B2-U0-G2	B2-U0-G2	ERLH_10B340____.IES	ERLH_10B330____.IES
	C3					B2-U0-G3	B2-U0-G2	ERLH_10C340____.IES	ERLH_10C330____.IES
	D3					B1-U0-G3	B1-U0-G2	ERLH_10D340____.IES	ERLH_10D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_10E340____.IES	ERLH_10E330____.IES
11	A3	11500	11000	98	98	B3-U0-G3	B2-U0-G2	ERLH_11A340____.IES	ERLH_11A330____.IES
	B3					B3-U0-G3	B2-U0-G2	ERLH_11B340____.IES	ERLH_11B330____.IES
	C3					B2-U0-G3	B2-U0-G3	ERLH_11C340____.IES	ERLH_11C330____.IES
	D3					B1-U0-G3	B1-U0-G2	ERLH_11D340____.IES	ERLH_11D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_11E340____.IES	ERLH_11E330____.IES
13	A3	13000	12500	111	111	B3-U0-G3	B3-U0-G3	ERLH_13A340____.IES	ERLH_13A330____.IES
	B3					B2-U0-G3	B2-U0-G3	ERLH_13B340____.IES	ERLH_13B330____.IES
	C3					B2-U0-G3	B2-U0-G3	ERLH_13C340____.IES	ERLH_13C330____.IES
	D3					B2-U0-G3	B2-U0-G3	ERLH_13D340____.IES	ERLH_13D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_13E340____.IES	ERLH_13E330____.IES
14	A3	14000	13400	122	122	B3-U0-G3	B3-U0-G3	ERLH_14A340____.IES	ERLH_14A330____.IES
	B3					B2-U0-G3	B2-U0-G3	ERLH_14B340____.IES	ERLH_14B330____.IES
	C3					B2-U0-G3	B2-U0-G3	ERLH_14C340____.IES	ERLH_14C330____.IES
	D3					B2-U0-G3	B2-U0-G3	ERLH_14D340____.IES	ERLH_14D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_14E340____.IES	ERLH_14E330____.IES
15	A3	15000	14400	136	136	B3-U0-G3	B3-U0-G3	ERLH_15A340____.IES	ERLH_15A330____.IES
	B3					B2-U0-G3	B2-U0-G3	ERLH_15B340____.IES	ERLH_15B330____.IES
	C3					B2-U0-G3	B2-U0-G3	ERLH_15C340____.IES	ERLH_15C330____.IES
	D3					B2-U0-G3	B2-U0-G3	ERLH_15D340____.IES	ERLH_15D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_15E340____.IES	ERLH_15E330____.IES
16	A3	16000	15300	149	149	B3-U0-G3	B3-U0-G3	ERLH_16A340____.IES	ERLH_16A330____.IES
	B3					B3-U0-G3	B3-U0-G3	ERLH_16B340____.IES	ERLH_16B330____.IES
	C3					B2-U0-G3	B2-U0-G3	ERLH_16C340____.IES	ERLH_16C330____.IES
	D3					B2-U0-G3	B2-U0-G3	ERLH_16D340____.IES	ERLH_16D330____.IES
	E3					B3-U0-G3	B3-U0-G3	ERLH_16E340____.IES	ERLH_16E330____.IES

Photometrics:

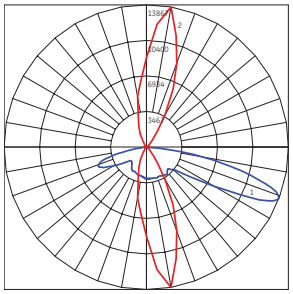
Evolve™ LED Streetlight (ERLH)

ERLH
Type II Narrow
(13A340)

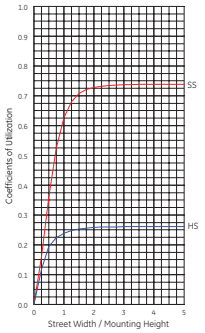
13,000 Lumens
4000K
ERLH_13A340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

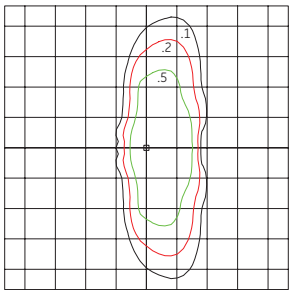


– Vertical plane through horizontal angle of Max. Cd at 80°
– Horizontal cone through vertical angle of Max. Cd at 69°

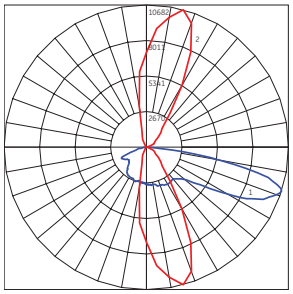


ERLH
Type II Wide
(13B340)

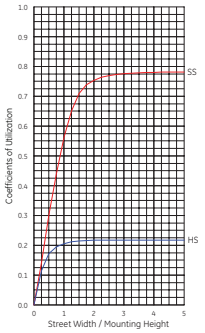
13,000 Lumens
4000K
ERLH_13B340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

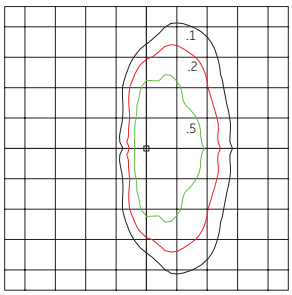


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 72°

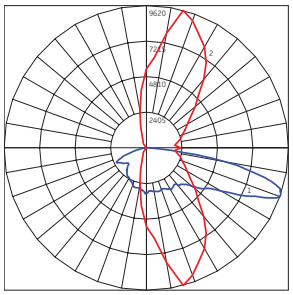


ERLH
Type III
(13C340)

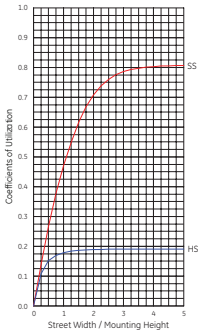
13,000 Lumens
4000K
ERLH_13C340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

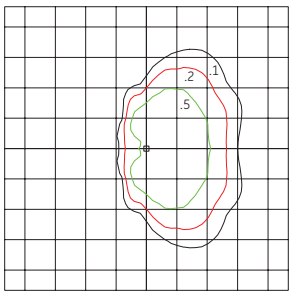


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 71°

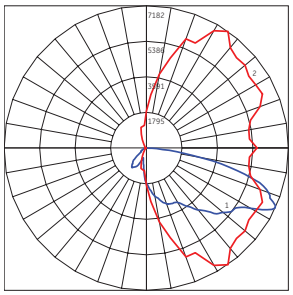


ERLH
Type IV
13D340

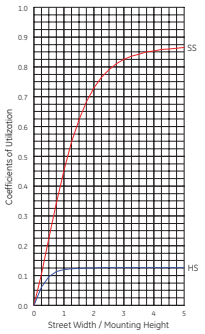
13,000 Lumens
4000K
ERLH_13D340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

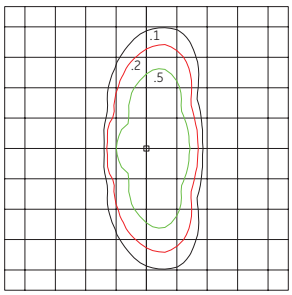


– Vertical plane through horizontal angle of Max. Cd at 55°
– Horizontal cone through vertical angle of Max. Cd at 65°

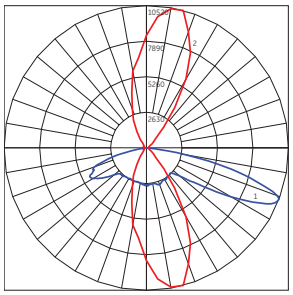


ERLH
Type II Enhanced Back Light
13E340

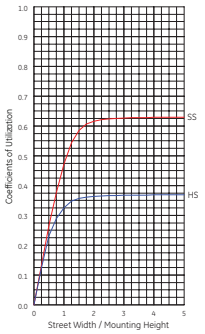
13,000 Lumens
4000K
ERLH_13E340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade



– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 69°



GE Evolve™

LED Roadway Lighting

ERL1-ERLH-ERL2

Project name ______________
Date ______________
Type ______________

E R L 2 _ _ _ _   _   _ _   _ _   _ _   _   _ _ _ _   _ _ _

PROD. ID	VOLTAGE	LUMEN OUTPUT	DISTRIBUTION*	CCT	CONTROLS	COLOR	OPTIONS
E = Evolve **R** = Roadway **L** = Local **2** = Double Module	**0** = 120-277V* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* * Not available with Fusing. Must choose a discrete voltage with F option.	**16** **18** **19** **21** **23** **25** **27** **28** **30** See Table	**A3** = Type II Narrow **B3** = Type II Wide **C3** = Type III **D3** = Type IV **E3** = Type II Enhanced Back Light See Table *Nominal IES Type classing subject to typical variation, individual units may differ.	**30** = 3000K◇ **40** = 4000K ◇ Select 3000K CCT for IDA approved units.	**A** = ANSI C136.41 7-pin **D** = ANSI C136.41 7-pin with Shorting Cap **E** = ANSI C136.41 7-pin with non-Dimming PE Control.* *PE Control Only available for 120-277V or 480V Discrete. Not available for 347-480V or 347V Discrete. **NOTE:** Dimming controls wired for 0-10V standard unless DALI option "U" requested.	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze	**A** = 4 Bolt Slipfitter † **F** = Fusing **G** = Internal Bubble Level **I** = IP66 Optical **L** = Tool-Less Entry **R** = Secondary 10kV/5kA SPD **U** = DALI Programmable ^ **Y** = Coastal Finish * **XXX** = Special Options † Contact manufacturer for Lead-Time. * Recommended for installations within 750 ft. from the coast. Contact Factory for Lead-Time. + Compatible with LightGrid 2.0 nodes. ^ Not available in 347V, 480V or 347-480V.

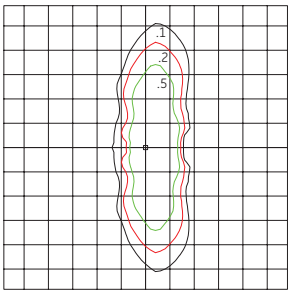
LUMEN OUTPUT	DISTRIBUTION	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 3000K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	BUG RATING 4000K	BUG RATING 3000K	IES FILE NUMBER 4000K 120-277V	IES FILE NUMBER 4000K 347-480V	IES FILE NUMBER 3000K 120-277V	IES FILE NUMBER 3000K 347-480V
16	A3	16000	15300	120	120	B3-U0-G3	B3-U0-G3	ERL2_16A340____.IES		ERL2_16A330____.IES	
	B3					B3-U0-G3	B3-U0-G3	ERL2_16B340____.IES		ERL2_16B330____.IES	
	C3					B2-U0-G3	B2-U0-G3	ERL2_16C340____.IES		ERL2_16C330____.IES	
	D3					B2-U0-G3	B2-U0-G3	ERL2_16D340____.IES		ERL2_16D330____.IES	
	E3					B3-U0-G3	B3-U0-G3	ERL2_16E340____.IES		ERL2_16E330____.IES	
18	A3	18000	17300	140	140	B3-U0-G3	B3-U0-G3	ERL2_18A340____.IES		ERL2_18A330____.IES	
	B3					B3-U0-G3	B3-U0-G3	ERL2_18B340____.IES		ERL2_18B330____.IES	
	C3					B2-U0-G3	B2-U0-G3	ERL2_18C340____.IES		ERL2_18C330____.IES	
	D3					B2-U0-G3	B2-U0-G3	ERL2_18D340____.IES		ERL2_18D330____.IES	
	E3					B3-U0-G3	B3-U0-G3	ERL2_18E340____.IES		ERL2_18E330____.IES	
19	A3	19000	18200	149	149	B3-U0-G3	B3-U0-G3	ERL2_19A340____.IES		ERL2_19A330____.IES	
	B3					B3-U0-G3	B3-U0-G3	ERL2_19B340____.IES		ERL2_19B330____.IES	
	C3					B3-U0-G3	B2-U0-G3	ERL2_19C340____.IES		ERL2_19C330____.IES	
	D3					B2-U0-G3	B2-U0-G3	ERL2_19D340____.IES		ERL2_19D330____.IES	
	E3					B3-U0-G3	B3-U0-G3	ERL2_19E340____.IES		ERL2_19E330____.IES	
21	A3	21000	20100	174	177	B3-U0-G3	B3-U0-G3	ERL2_21A340_-120-277V.IES	ERL2_21A340_-347-480V.IES	ERL2_21A330_-120-277V.IES	ERL2_21A330_-347-480V.IES
	B3					B3-U0-G3	B3-U0-G3	ERL2_21B340_-120-277V.IES	ERL2_21B340_-347-480V.IES	ERL2_21B330_-120-277V.IES	ERL2_21B330_-347-480V.IES
	C3					B3-U0-G4	B3-U0-G3	ERL2_21C340_-120-277V.IES	ERL2_21C340_-347-480V.IES	ERL2_21C330_-120-277V.IES	ERL2_21C330_-347-480V.IES
	D3					B2-U0-G3	B2-U0-G3	ERL2_21D340_-120-277V.IES	ERL2_21D340_-347-480V.IES	ERL2_21D330_-120-277V.IES	ERL2_21D330_-347-480V.IES
	E3					B3-U0-G3	B3-U0-G3	ERL2_21E340_-120-277V.IES	ERL2_21E340_-347-480V.IES	ERL2_21E330_-120-277V.IES	ERL2_21E330_-347-480V.IES
23	A3	23000	22100	194	196	B3-U0-G3	B3-U0-G3	ERL2_23A340_-120-277V.IES	ERL2_23A340_-347-480V.IES	ERL2_23A330_-120-277V.IES	ERL2_23A330_-347-480V.IES
	B3					B3-U0-G3	B3-U0-G3	ERL2_23B340_-120-277V.IES	ERL2_23B340_-347-480V.IES	ERL2_23B330_-120-277V.IES	ERL2_23B330_-347-480V.IES
	C3					B3-U0-G4	B3-U0-G4	ERL2_23C340_-120-277V.IES	ERL2_23C340_-347-480V.IES	ERL2_23C330_-120-277V.IES	ERL2_23C330_-347-480V.IES
	D3					B2-U0-G4	B2-U0-G4	ERL2_23D340_-120-277V.IES	ERL2_23D340_-347-480V.IES	ERL2_23D330_-120-277V.IES	ERL2_23D330_-347-480V.IES
	E3					B4-U0-G4	B3-U0-G3	ERL2_23E340_-120-277V.IES	ERL2_23E340_-347-480V.IES	ERL2_23E330_-120-277V.IES	ERL2_23E330_-347-480V.IES
25	A3	25000	24000	214	214	B3-U0-G3	B3-U0-G3	ERL2_25A340____.IES		ERL2_25A330____.IES	
	B3					B3-U0-G3	B3-U0-G3	ERL2_25B340____.IES		ERL2_25B330____.IES	
	C3					B3-U0-G4	B3-U0-G4	ERL2_25C340____.IES		ERL2_25C330____.IES	
	D3					B2-U0-G4	B2-U0-G4	ERL2_25D340____.IES		ERL2_25D330____.IES	
	E3					B4-U0-G4	B4-U0-G4	ERL2_25E340____.IES		ERL2_25E330____.IES	
27	A3	27000	25900	237	237	B3-U0-G3	B3-U0-G3	ERL2_27A340____.IES		ERL2_27A330____.IES	
	B3					B3-U0-G4	B3-U0-G4	ERL2_27B340____.IES		ERL2_27B330____.IES	
	C3					B3-U0-G4	B3-U0-G4	ERL2_27C340____.IES		ERL2_27C330____.IES	
	D3					B2-U0-G4	B2-U0-G4	ERL2_27D340____.IES		ERL2_27D330____.IES	
	E3					B4-U0-G4	B4-U0-G4	ERL2_27E340____.IES		ERL2_27E330____.IES	
28	A3	28000	26900	251	251	B3-U0-G3	B3-U0-G3	ERL2_28A340____.IES		ERL2_28A330____.IES	
	B3					B3-U0-G4	B3-U0-G4	ERL2_28B340____.IES		ERL2_28B330____.IES	
	C3					B3-U0-G4	B3-U0-G4	ERL2_28C340____.IES		ERL2_28C330____.IES	
	D3					B2-U0-G4	B2-U0-G4	ERL2_28D340____.IES		ERL2_28D330____.IES	
	E3					B4-U0-G4	B4-U0-G4	ERL2_28E340____.IES		ERL2_28E330____.IES	
30	A3	30000	28800	278	278	B4-U0-G4	B4-U0-G4	ERL2_30A340____.IES		ERL2_30A330____.IES	
	B3					B3-U0-G4	B3-U0-G4	ERL2_30B340____.IES		ERL2_30B330____.IES	
	C3					B3-U0-G4	B3-U0-G4	ERL2_30C340____.IES		ERL2_30C330____.IES	
	D3					B2-U0-G4	B2-U0-G4	ERL2_30D340____.IES		ERL2_30D330____.IES	
	E3					B4-U0-G4	B4-U0-G4	ERL2_30E340____.IES		ERL2_30E330____.IES	

Photometrics:

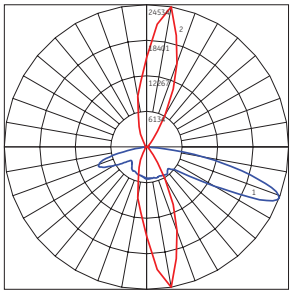
Evolve™ LED Streetlight (ERL2)

ERL2
Type II Narrow
(23A340)

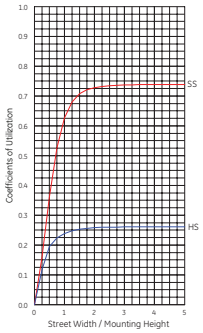
23,000 Lumens
4000K
ERL2_23A340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

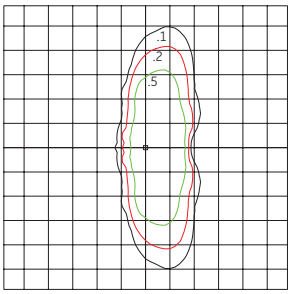


– Vertical plane through horizontal angle of Max. Cd at 80°
– Horizontal cone through vertical angle of Max. Cd at 69°

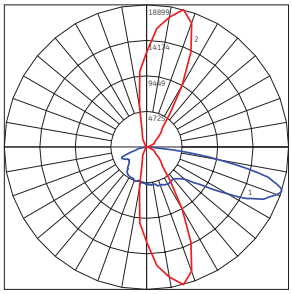


ERL2
Type II Wide
(23B340)

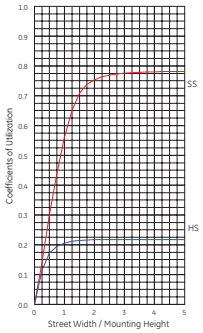
23,000 Lumens
4000K
ERL2_23B340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

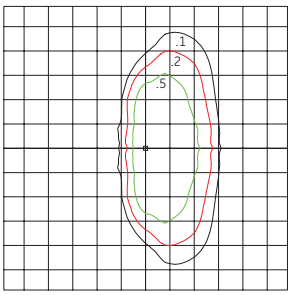


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 72°

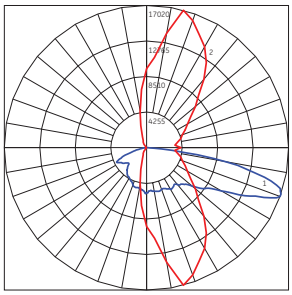


ERL2
Type III
(23C340)

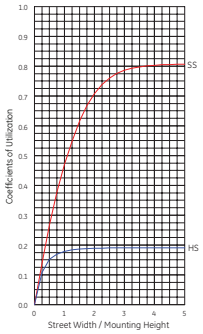
23,000 Lumens
4000K
ERL2_23C340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

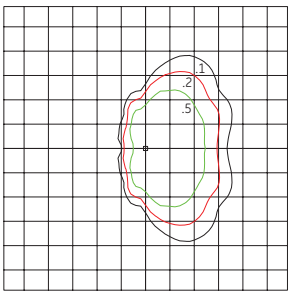


– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 71°

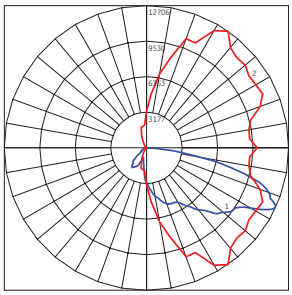


ERL2
Type IV
(23D340)

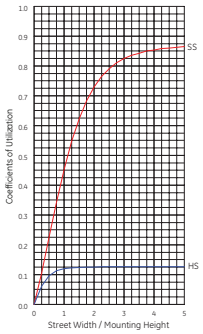
23,000 Lumens
4000K
ERL2_23D340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade

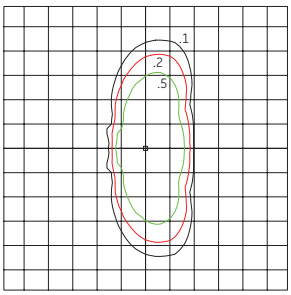


– Vertical plane through horizontal angle of Max. Cd at 55°
– Horizontal cone through vertical angle of Max. Cd at 65°

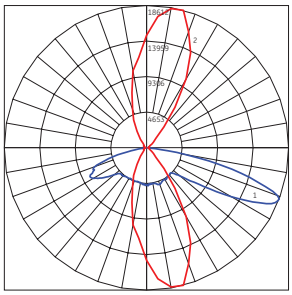


ERL2
Type II Enhanced Back Light
(23E340)

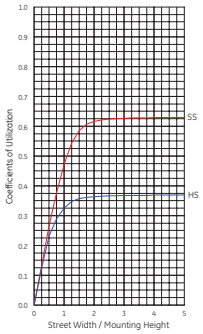
23,000 Lumens
4000K
ERL2_23E340___.IES



Grid Distance in Units of Mounting Height at 30'
Initial Footcandle Values at Grade



– Vertical plane through horizontal angle of Max. Cd at 75°
– Horizontal cone through vertical angle of Max. Cd at 69°



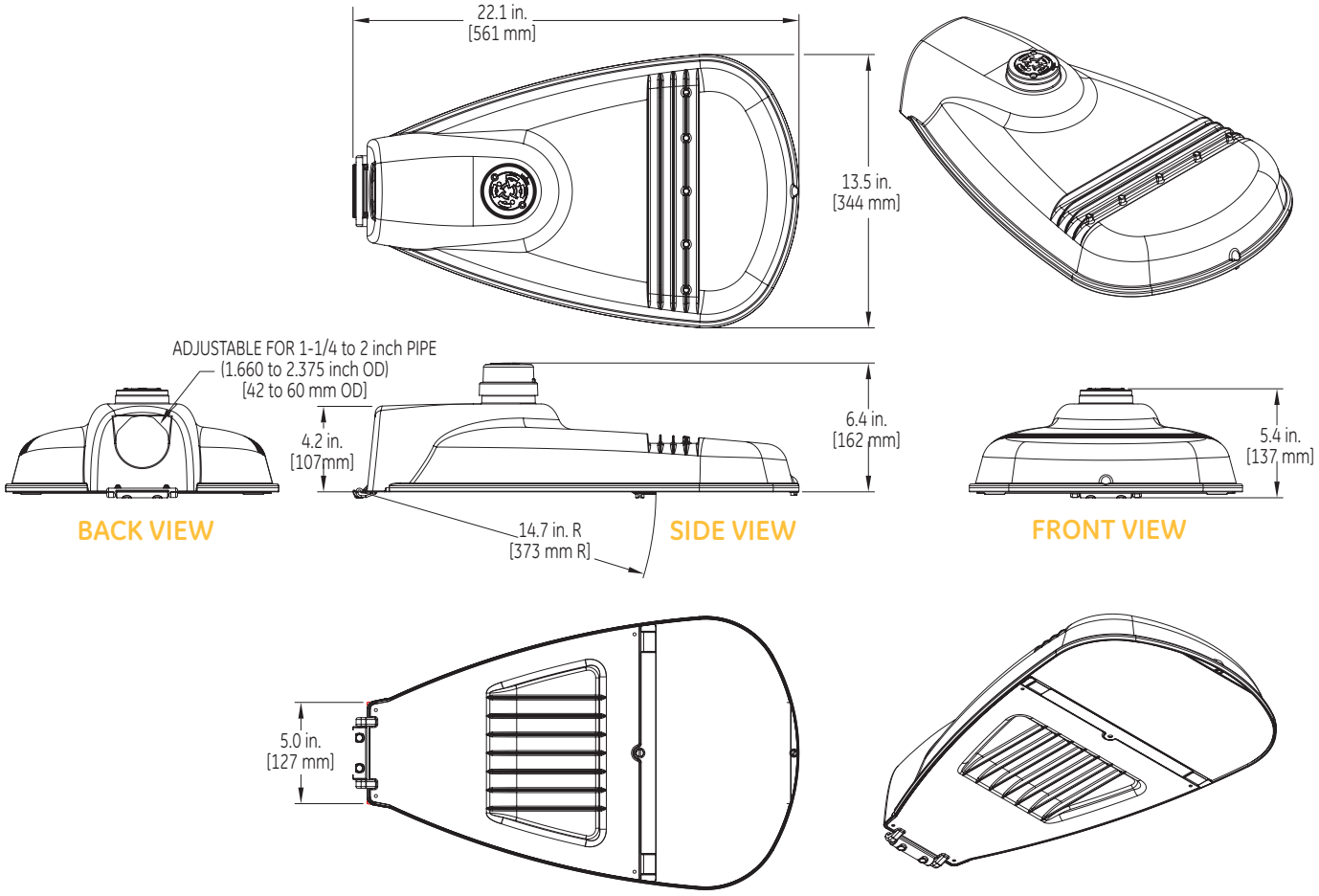
GE Evolve™

LED Roadway Lighting

ERL1-ERLH-ERL2

Product Dimensions:

Evolve™ LED Streetlight (ERL1)



DATA

- Approximate net weight: 12.4 lbs (5.6kgs) -15.5 lbs (7.0kgs) with XFMR
- Effective Projected Area (EPA): 0.5 sq ft max (0.046 sq m)

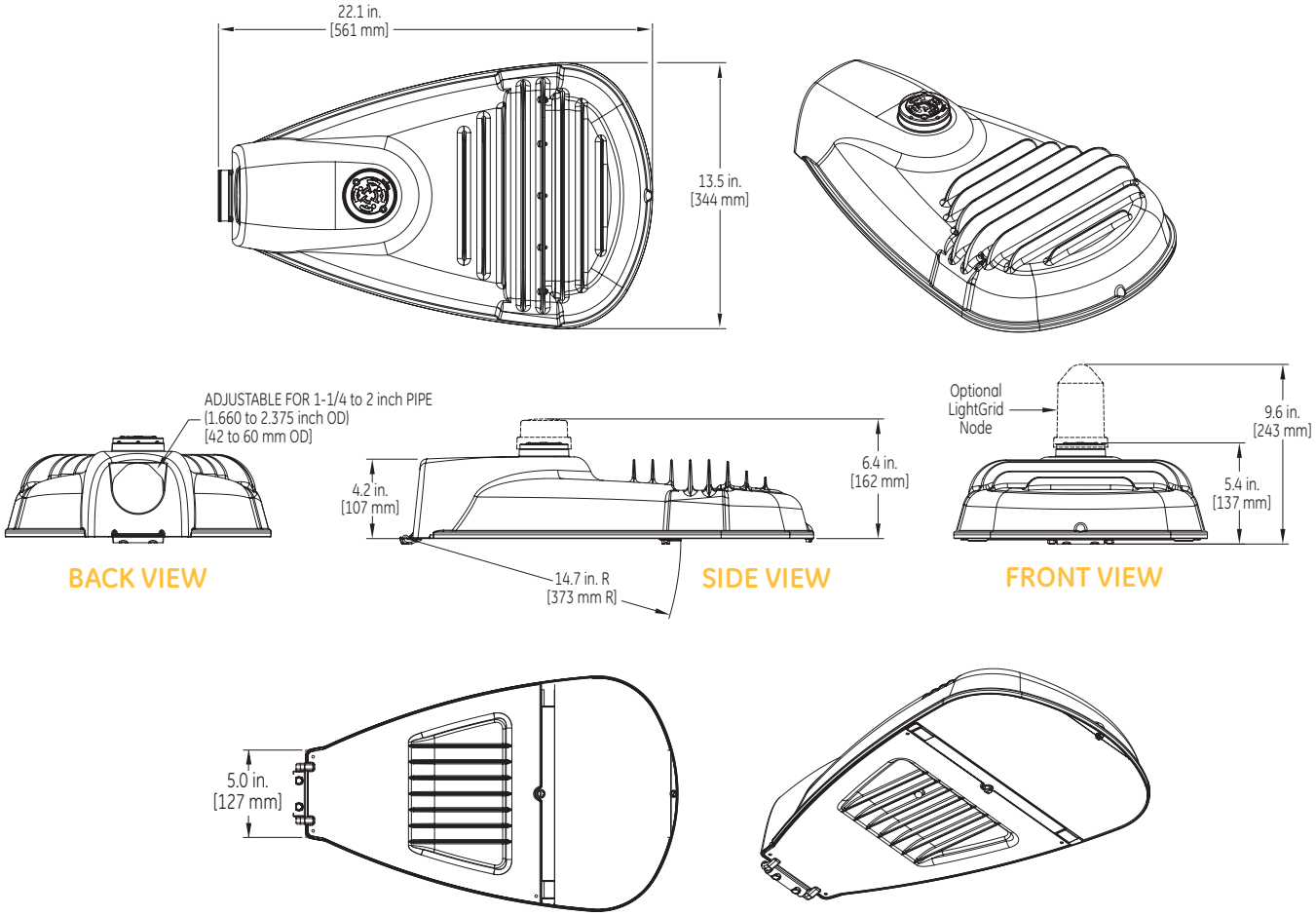
GE Evolve™

LED Roadway Lighting

ERL1-ERLH-ERL2

Product Dimensions:

Evolve™ LED Streetlight (ERLH)



DATA

- Approximate net weight: 15.15 lbs (6.9 kgs) - 2 Bolt Slipfitter
- Approximate net weight: 15.85 lbs (7.2 kgs) - 4 Bolt Slipfitter
- Effective Projected Area (EPA): 0.5 sq ft max (0.046 sq m)

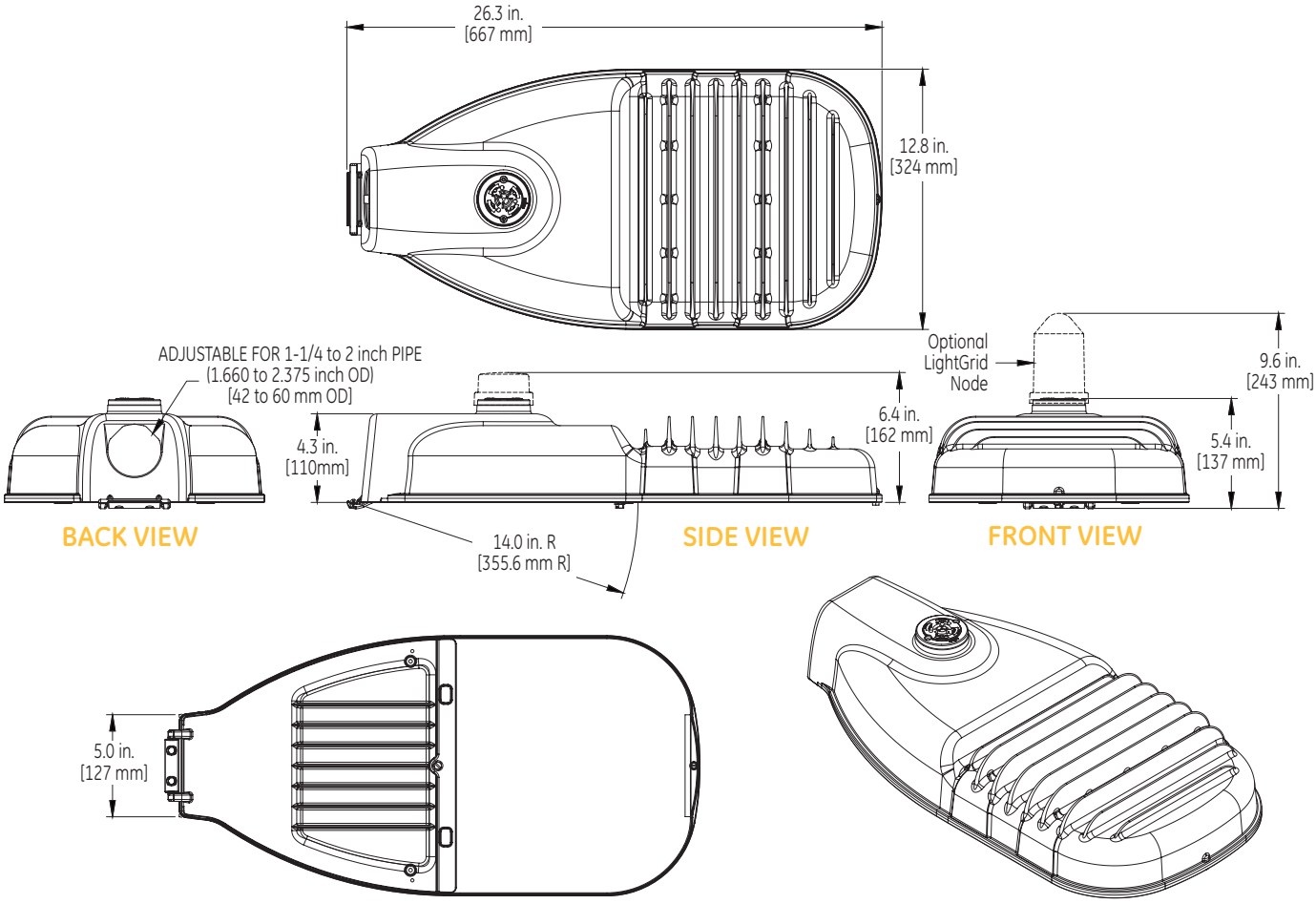
GE Evolve™

LED Roadway Lighting

ERL1-ERLH-ERL2

Product Dimensions:

Evolve™ LED Streetlight (ERL2)



DATA

- Approximate net weight: 24.0 lbs (10.9 kgs)
  Contact manufacturer for specific configuration weight.
- Effective Projected Area (EPA): 0.57 sq ft max (0.053 sq m)

GE Evolve™

LED Flood & Spot L

EFM1

current
powered by GE

GE Evolve™
LED Flood & Spot Lighting
EFM1

The **GE Evolve™ LED Medium Output Flood Light** is our mid-lumen solution to efficiently illuminate building façade, flag poles, billboard signage and many more traditional flood applications. Designed to replace up to 250W HPS and 250-400W Metal Halide flood lights, the EFM1 provides significant operating cost benefits over the life of each fixture with reduced energy consumption and a long rated life that virtually eliminates ongoing maintenance expenses.

Features:

- 70 CRI at 3000K, 4000K and 5000K
- L89@100K hrs per IES TM-21*
- Distributions: 6x5, 6x6, 7x6, 7x7, Type III, 20° Spot
- 120-277 VAC and 347-480 VAC available
- DALI compatible
- Mounting options: Trunnion, Knuckle Slipfitter, & Knuckle Wall Mount
- UL/cUL listed, suitable for wet locations
- Complies with the material restrictions of RoHS

Applications:

- Building façade, flag poles, utility and industrial spaces, billboard signage, roadways, general site lighting, and many more traditional flood applications.

NOTE: The Type III distribution is ideal for building facade and billboard signage.
*S2 T3 distributions not L89 rated

Compatible with **LightGrid™** Outdoor Wireless Control System

Also available in 20° Spot optical distribution as pictured here →

To learn more about **GE Evolve LED Flood Lighting**, go to: **www.currentbyge.com**

GE Evolve™
LED Flood & Spot Lighting
EFM1

Project name _____
Date _____
Type _____

Typical Specifications:

LED & Optical

- Evolve™ light engine consisting of reflective technology designed to optimize application efficiency.
- Impact resistant tempered flat glass protects the optics and minimizes dirt accumulation.
- **Efficacy:** Rated LPW 104-167 (See Table)
- LM-79 tests and reports in accordance with IESNA standards
- 70CRI at 3000K, 4000K, 5000K
- **Distributions:** 6x5, 6x6, 7x6, 7x7, Type III, 20° Spot

Electrical

- 120-277 VAC and 347-480 VAC available.
- System power factor is >90% and THD <20%.
- ANSI C136.41 7-pin dimming receptacle, standard.
- Photo electric sensors (PE) available for all voltages and ordered seperately.
- Light Grid compatible
- **Dimming:**
  - 0-10V continuous dimming
  - DALI digital dimming (120-277V)
- Surge Protection per ANSI C136.2-2015.
  - 6kV/3kA Standard
  - 10kV/5kA Optional
  - 20kV/10kA Optional (contact manufacturer for availability)
- Daintree compatible Motion Sensor (K1, S1 Mount Option)

Ratings

- UL cUL listed, suitable for wet locations.
- IP66 otical enclosure per ANSI C136.25-2013
- Temperature Rated –40°C to +50°C
- Complies with the material restrictions of RoHS

Construction & Finish

- **Housing:**
  - Die cast aluminum housing with slim design.
  - Integral heat sink and light engine, ensuring maximum heat transfer and prolonged LED life.
  - 3G vibration level per ANSI C136.31-2010.
- **Paint:** Corrosion resistant polyester powder painted, minimum 2.0 mil. thickness.
  - Standard Colors: Dark Bronze, Black, White & Gray
  - RAL & custom colors available
- **Weight:** 25 lbs. (11.34kg)

Lumen Maintenance EFM101

- Projected Lxx per IES TM-21 at 25°C for reference:

OPTICAL CODES	DISTRIBUTION	LXX(10K)@HOURS		
		25,000 HR	50,000 HR	100,000 HR
AA, BB, CC	T3 & S2	L93	L87	L75

OPTICAL CODES	DISTRIBUTION	LXX(10K)@HOURS		
		25,000 HR	50,000 HR	100,000 HR
AA, BB, CC, DD	65, 66, 76, & 77	L96	L93	L89

Note: Projected Lxx based on LM80 (10,000 hour testing). DOE Lighting Facts Verification Testing Tolerances apply to initial luminous flux and lumen maintenance measurements.

Mounting

Option K
- K1=Knuckle Slipfitter for 1.9 in-2.3 in OD Tenon with wires exiting tenon.
- K2=Knuckle Slipfitter for 1.9 in-2.3 in OD Tenon, external 3ft #14/3 power cable

Option S
- S1 = Knuckle Slipfitter for 1.9 in – 3.0 in. OD Tenon with wires exiting tenon.
- S2 = Knuckle Slipfitter for 1.9 in – 3.0 in. OD Tenon, with external 3ft #14/3 power cable

Option V
- V1=Knuckle Wall Mount with wires exiting tenon.

Option T
- T1=Trunnion, with external 3ft #14/3 power cable.

Warranty

- **System Warranty:** 5 Year Standard

Accessories

- Top & Side Visor
- Vandal Shield
- Wire Guard
- Barn Door Assembly

GE Evolve™
LED Flood & Spot Lighting
EFM1

Project name _____
Date _____
Type _____

Ordering Number Logic

E FM1 01 ____ __ _ __ __ _ __ _ _ __ ____ ___

PROD. ID	GEN.	VOLTAGE	OPTIC CODE	DISTRIBUTION*	CRI	CCT	DIMMING	CONTROLS	MOUNTING	FINISH	OPTIONS
E = Evolve **FM** = Flood Medium **1** = Standard	**01** = 1st Gen	**0** = 120-277V* **1** = 120V **2** = 208V **3** = 240V **4** = 277V **5** = 480V **D** = 347V **H** = 347-480V* *Not available with fusing	**AA** = 5,000lm **BB** = 10,000lm **CC** = 15,000lm **DD** = 20,000lm	**65** = NEMA 6x5 **66** = NEMA 6x6 **76** = NEMA 7x6 **77** = NEMA 7x7 (80° Wide Flood) **T3** = Type 3/ Facade/Billboard* **S2** = 20° Spot* *Not available with optical code DD	**7** = 70 (min)	**30** = 3000K **40** = 4000K **50** = 5000K	**A** = ANSI C1 36.41 7-Pin Receptacle++ **D** = No Receptacle, with external dimming 18/2 3ft cable+ **N** = No PE receptacle & non-dimmable+ **P** = ANSI 7-pin receptacle with external dimming 18/2 3ft cable++ +Unrestricted aiming angle ++All units with option A and P have Restricted Aiming Angle. See page 8.	**A** = No Control **D** = Shorting Cap* See below ordering logic for dimming PE and standard PE control options. Light Grid also available. Must order separately. * Can only be ordered with dimming option A or P	**K1** = Knuckle Slipfitter for 1.9 in-2.3 in. OD Tenon* **S1** = Knuckle Slipfitter for 1.9 in-3.0 in. OD Tenon* **K2** = Knuckle Slipfitter for 1.9 in-2.3 in OD Tenon with external 3ft #14/3 power cable **S2** = Knuckle Slipfitter for 1.9 in-3.0 in. OD Tenon with external 3ft #14/3 power cable **V1** = Knuckle Wall Mount* **T1** = Trunnion with external 3ft #14/3 power cable. *Supplied with leads	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze **WHTE** = White	**F** = Fusing **H** = Daintree enabled motion sensor# ^ **L** = Tool-Less Entry **R** = 10kV/5kA Enhanced Surge Protection **T** = 20kV/10kA Surge Protection> **U** = DALI Dimming +# **V** = 3-Position Terminal Block **XXX** = Special Options + Compatible with LightGrid 2.0 nodes. # Not available in 347V-480V ^ Only available in mount K1 or S1 < Dimming and Fusing not available with Optical Code AA for distributions "T3" and "S2" > Check manufacturer for availability **NOTE:** Options F, R, T, and V not available with optical code AA with voltage 347 - 480 and distributions 65, 66, 76, and 77.

OPTICAL CODE	DIST. CODE	OPTICAL DIST./NEMA CLASS	TYPICAL INITIAL LUMENS 3000K	TYPICAL INITIAL LUMENS 4000K/ 5000K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	IES FILE NUMBER 3000K 120-277V	IES FILE NUMBER 3000K 347-480V	IES FILE NUMBER 4000K 120-277V	IES FILE NUMBER 4000K 347-480V	IES FILE NUMBER 5000K 120-277V	IES FILE NUMBER 5000K 347-480V
AA	77	7X7	4900	5000	30	32	EFM101_AA77730_-120-277V.IES	EFM101_AA77730_-347-480V.IES	EFM101_AA77740_-120-277V.IES	EFM101_AA77740_-347-480V.IES	EFM101_AA77750_-120-277V.IES	EFM101_AA77750_-347-480V.IES
BB	77	7X7	9800	10000	64	64	EFM101_BB77730__.IES		EFM101_BB77740__.IES		EFM101_BB77750__.IES	
CC	77	7X7	14700	15000	96	96	EFM101_CC77730__.IES		EFM101_CC77740__.IES		EFM101_CC77750__.IES	
DD	77	7X7	20400	20900	146	146	EFM101_DD77730__.IES		EFM101_DD77740__.IES		EFM101_DD77750__.IES	
AA	76	7X6	4700	4800	30	32	EFM101_AA76730_-120-277V.IES	EFM101_AA76730_-347-480V.IES	EFM101_AA76740_-120-277V.IES	EFM101_AA76740_-347-480V.IES	EFM101_AA76750_-120-277V.IES	EFM101_AA76750_-347-480V.IES
BB	76	7X6	9500	9700	64	64	EFM101_BB76730__.IES		EFM101_BB76740__.IES		EFM101_BB76750__.IES	
CC	76	7X6	14300	14600	96	96	EFM101_CC76730__.IES		EFM101_CC76740__.IES		EFM101_CC76750__.IES	
DD	76	7X6	19900	20400	146	146	EFM101_DD76730__.IES		EFM101_DD76740__.IES		EFM101_DD76750__.IES	
AA	66	6X6	4700	4800	30	32	EFM101_AA66730_-120-277V.IES	EFM101_AA66730_-347-480V.IES	EFM101_AA66740_-120-277V.IES	EFM101_AA66740_-347-480V.IES	EFM101_AA66750_-120-277V.IES	EFM101_AA66750_-347-480V.IES
BB	66	6X6	9400	9600	64	64	EFM101_BB66730__.IES		EFM101_BB66740__.IES		EFM101_BB66750__.IES	
CC	66	6X6	14200	14500	96	96	EFM101_CC66730__.IES		EFM101_CC66740__.IES		EFM101_CC66750__.IES	
DD	66	6X6	19700	20200	146	146	EFM101_DD66730__.IES		EFM101_DD66740__.IES		EFM101_DD66750__.IES	
AA	65	6X5	4400	4500	30	32	EFM101_AA65730_-120-277V.IES	EFM101_AA65730_-347-480V.IES	EFM101_AA65740_-120-277V.IES	EFM101_AA65740_-347-480V.IES	EFM101_AA65750_-120-277V.IES	EFM101_AA65750_-347-480V.IES
BB	65	6X5	8900	9100	64	64	EFM101_BB65730__.IES		EFM101_BB65740__.IES		EFM101_BB65750__.IES	
CC	65	6X5	13400	13700	96	96	EFM101_CC65730__.IES		EFM101_CC65740__.IES		EFM101_CC65750__.IES	
DD	65	6X5	18700	19100	146	146	EFM101_DD65730__.IES		EFM101_DD65740__.IES		EFM101_DD65750__.IES	
AA*	T3	Type 3	6400	6600	50	50	EFM101_AAT3730__.IES		EFM101_AAT3740__.IES		EFM101_AAT3750__.IES	
BB	T3	Type 3	10200	10500	88	88	EFM101_BBT3730__.IES		EFM101_BBT3740__.IES		EFM101_BBT3750__.IES	
CC	T3	Type 3	14700	15000	141	141	EFM101_CCT3730__.IES		EFM101_CCT3740__.IES		EFM101_CCT3750__.IES	
AA*	S2	20° Spot	7100	7300	50	50	EFM101_AAS2730__.IES		EFM101_AAS2740__.IES		EFM101_AAS2750__.IES	
BB	S2	20° Spot	11300	11600	88	88	EFM101_BBS2730__.IES		EFM101_BBS2740__.IES		EFM101_BBS2750__.IES	
CC	S2	20° Spot	16300	16700	141	141	EFM101_CCS2730__.IES		EFM101_CCS2740__.IES		EFM101_CCS2750__.IES	

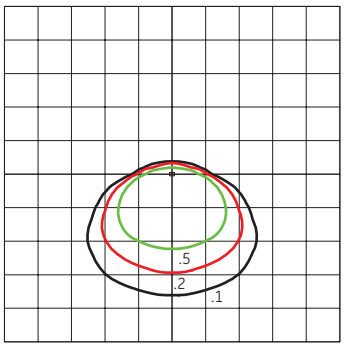
*Dimming not available

GE Evolve™
LED Flood & Spot Lighting
EFM1

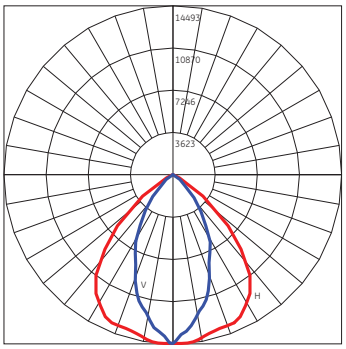
Photometrics:
Evolve™ LED Flood Light (EFM1)

EFM1
NEMA 6x5

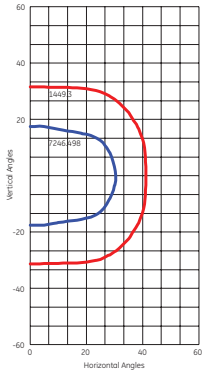
19,100 Lumens
4000K
EFM101_DD65740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 45°. Initial Footcandle Values at Grade

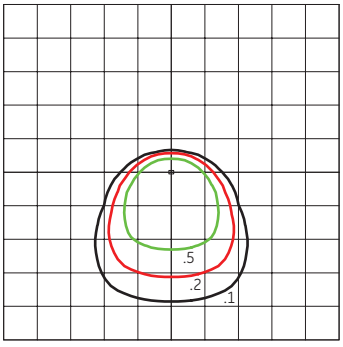


– Vertical angle of Max Cd. at -2.5°
– Horizontal angle of Max Cd. at 2.5°

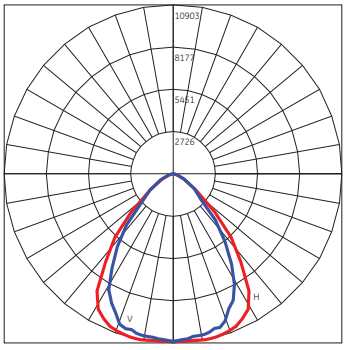


EFM1
NEMA 6x6

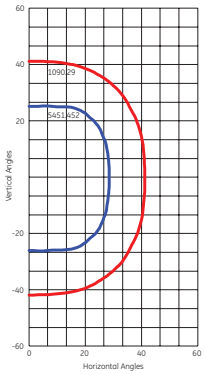
20,200 Lumens
4000K
EFM101_DD66740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 45°. Initial Footcandle Values at Grade

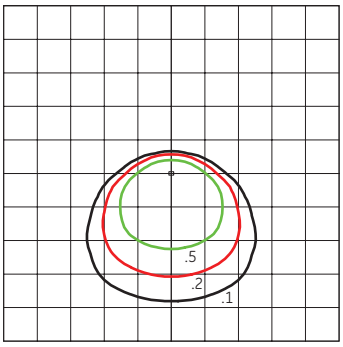


– Vertical angle of Max Cd. at -5°
– Horizontal angle of Max Cd. at 2.5°

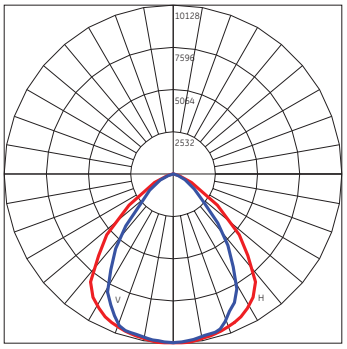


EFM1
NEMA 7x6

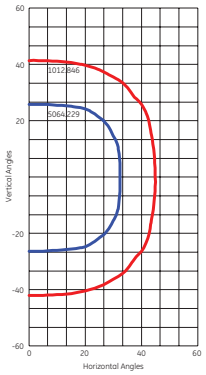
20,400 Lumens
4000K
EFM101_DD76740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 45°. Initial Footcandle Values at Grade



– Vertical angle of Max Cd. at -2.5°
– Horizontal angle of Max Cd. at 2.5°

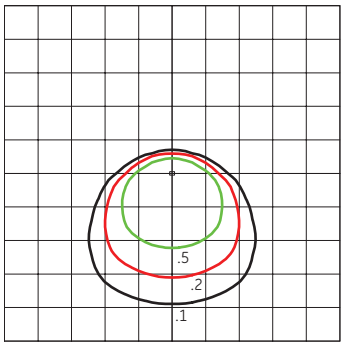


GE Evolve™
LED Flood & Spot Lighting
EFM1

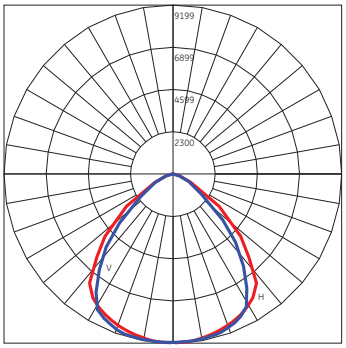
Photometrics:
Evolve™ LED Flood Light (EFM1)

EFM1
NEMA 7x7

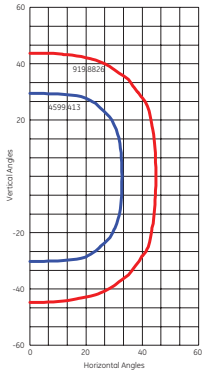
20,900 Lumens
4000K
EFM101_DD77740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 45°. Initial Footcandle Values at Grade

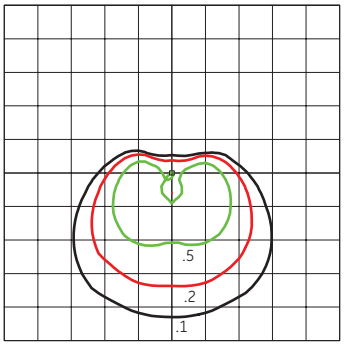


– Vertical angle of Max Cd. at -7.5°
– Horizontal angle of Max Cd. at 5°

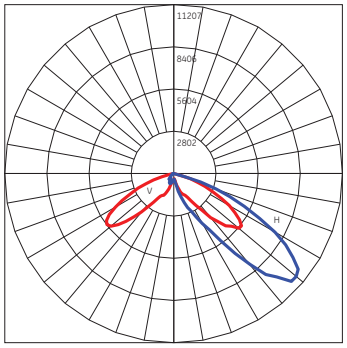


EFM1
TYPE III
FACADE/BILLBOARD

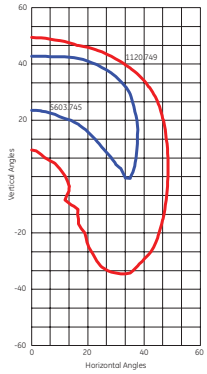
15,000 Lumens
4000K
EFM101_CCT3740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 25°. Initial Footcandle Values at Grade

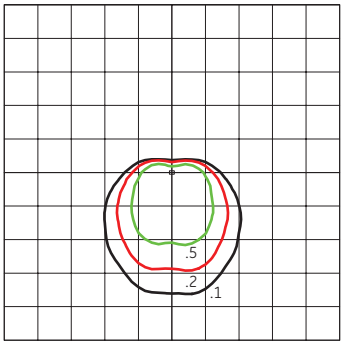


– Vertical angle of Max Cd. at 47.5°
– Horizontal angle of Max Cd. at 15°

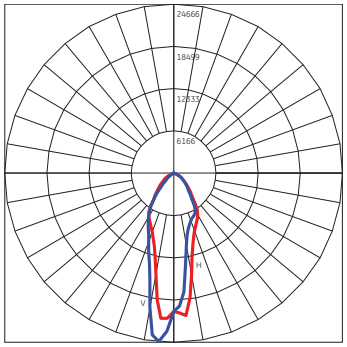


EFM1
20° SPOT

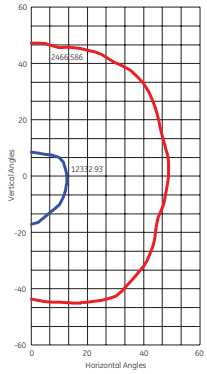
16,700 Lumens
4000K
EFM101_CCS2740_-



Grid Distance in Units of Mounting Height at 35'
Tilt is 45°. Initial Footcandle Values at Grade



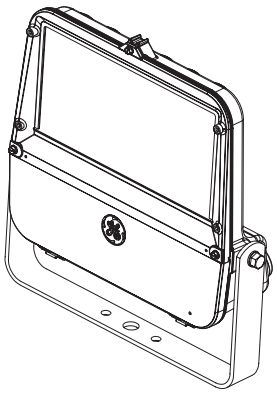
– Vertical angle of Max Cd. at -5°
– Horizontal angle of Max Cd. at 0°

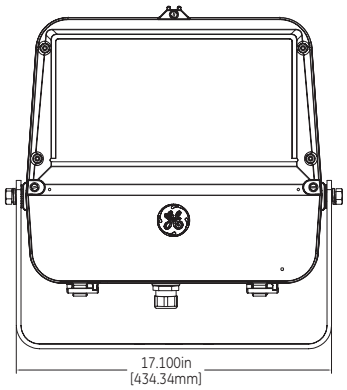


GE Evolve™
LED Flood & Spot Lighting
EFM1

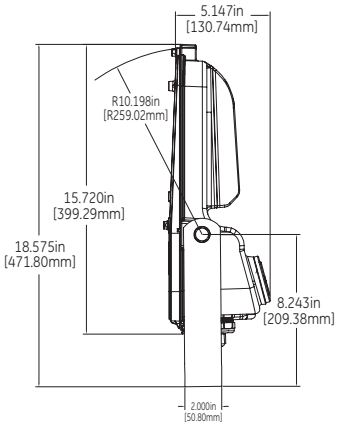
Product Dimensions:
Evolve™ LED Flood Light (EFM1)

TRUNNION MOUNT

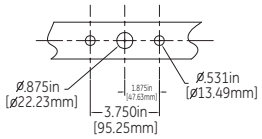




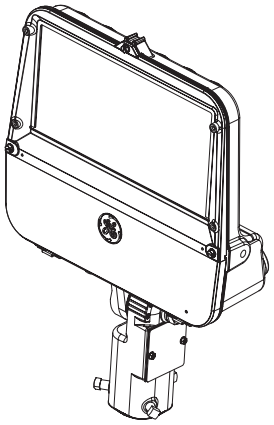
FRONT VIEW

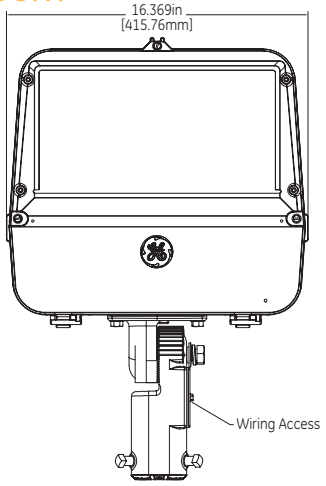


SIDE VIEW

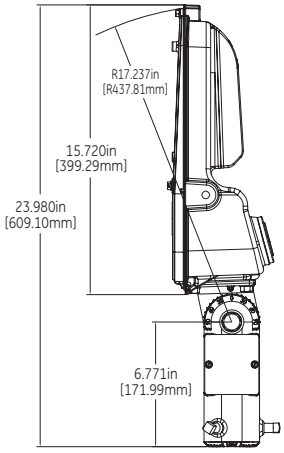


KNUCKLE SLIPFITTER MOUNT



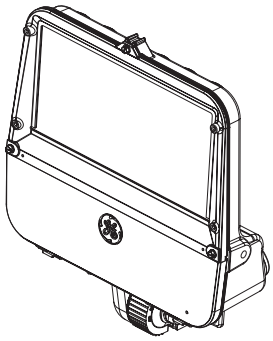


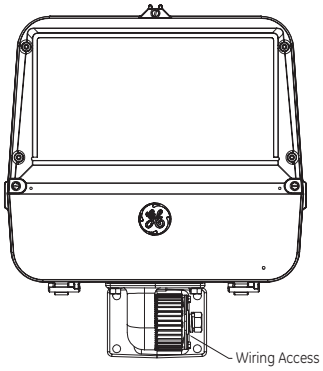
FRONT VIEW



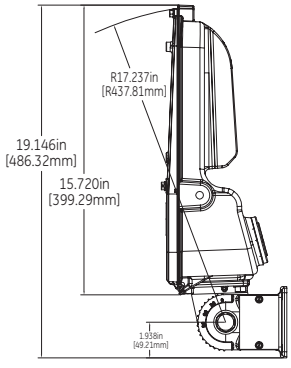
SIDE VIEW

KNUCKLE WALL MOUNT

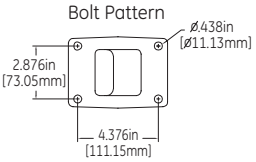




FRONT VIEW



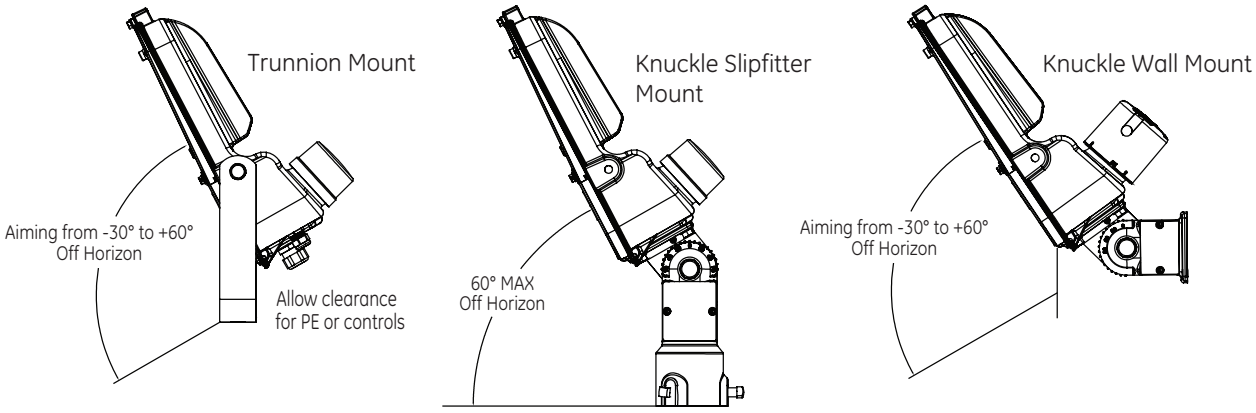
SIDE VIEW



GE Evolve™
LED Flood & Spot Lighting
EFM1

Product Dimensions:
Evolve™ LED Flood Light (EFM1)

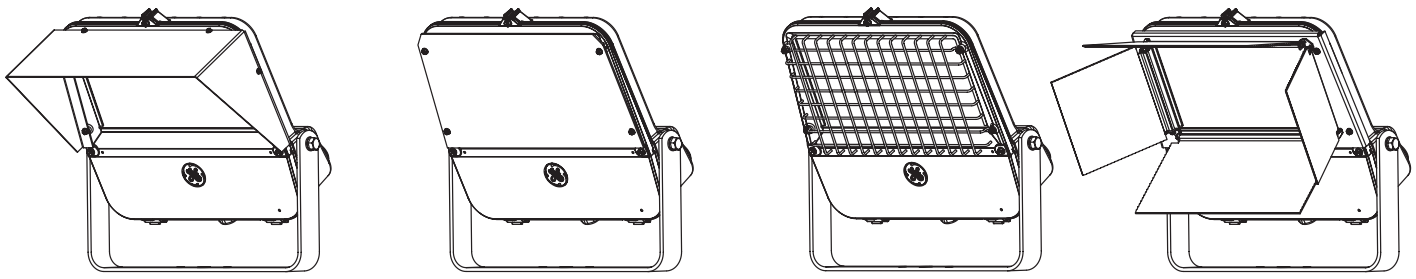
EFM1 - PE Aiming Restrictions



DATA

- Approximate Weight: 25 lbs. (11.34 kg)
- Effective Projected Area:
  - 0° aim (vertical glass) 1.96 sq. ft.
  - 45° aim 1.22 sq. ft.
  - Side profile (all aims) 0.73 sq. ft.
  - 90° (downward) aim 0.79 sq. ft.

EFM1 - Accessories



Top And Side Visor
Ordering Logic:
TSVGRAY-EFM
TSVBLCK-EFM
TSVDKBZ-EFM
TSVWHTE-EFM

Vandal Shield
Ordering Logic:
VAN-EFM

Wire Guard
Ordering Logic:
WG-EFM

Barn Doors
Ordering Logic:
BDAGRAY-EFM
BDABLCK-EFM
BDADKBZ-EFM
BDAWHTE-EFM

GE Evolve™
LED Flood & Spot Lighting
EFM1

Accessories
Evolve™ LED Flood Light (EFM1)

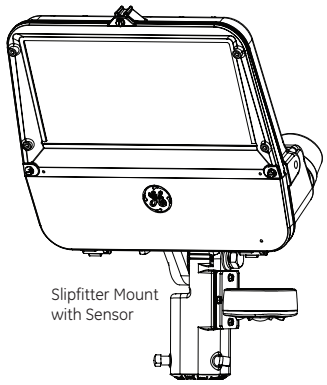
PE Accessories (to be ordered separately)

SAP Number	Part Number	Description
93029237	PED-MV-LED-7	ANSI C136.41 Dimming PE, 120-277V
93029238	PED-347-LED-7	ANSI C136.41 Dimming PE, 347V
93029239	PED-480-LED-7	ANSI C136.41 Dimming PE, 480V

SAP Number	Part Number	Description
28299	PEC0TL	STANDARD 120-277V
28294	PEC5TL	STANDARD 480V
80436	PECDTL	STANDARD 347V
73251	SCCL-PECTL	Shorting cap

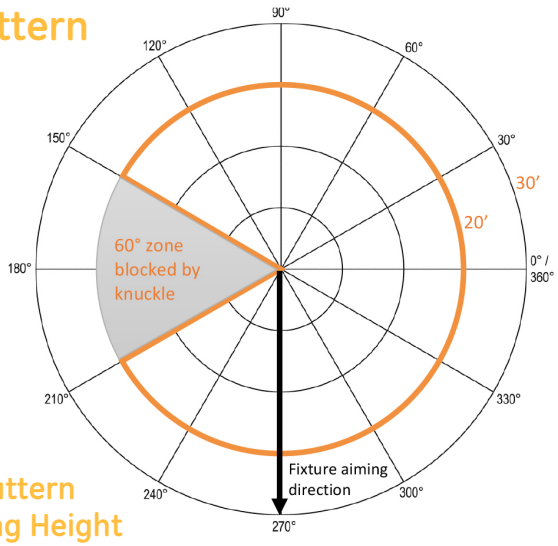
H-Motion Sensing Option

- Intended for applications, between 15-30 ft. mounting height. (4.57-9.14m). For mounting heights exceeding 30 ft., remote mounted sensors are recommended.
- Provides a coverage area radius for walking motion of 15-20 ft. (4.57-6.10m).
- Provides 300° of coverage (~60° is blocked by the knuckle).
- Standard factory settings:
  - 10% output when unoccupied, 100% output occupied.
  - Knuckle mounted PE Sensor.
  - 10 minute post-occupancy time delay, 5 minute dimming ramp-down.
- Fixture power increase of 1W expected with sensor use.


Slipfitter Mount with Sensor

Note: Standard options may be reprogrammed in the field. Reprogramming instructions included in product shipment.

Sensor Pattern



Sensing Pattern
30 ft. Mounting Height

Evolve™ LED Flood Lighting

EFH1

current
powered by GE

2016 PROGRESS Report SELECTION

Product Features

The GE Evolve™ LED High Output Flood Light is our brightest solution to efficiently illuminate building façade, flag poles, billboard signage and many more traditional flood applications. Designed to replace 250W-400W HPS and 400W-1000W Metal Halide flood lights, the EFH1 provides significant operating cost benefits over the life of each fixture with reduced energy consumption and a long rated life that virtually eliminates ongoing maintenance expenses.

Applications

- Site, area, and general lighting applications utilizing advanced LED reflective optical system.

Housing

- Die-cast aluminum housing.
- Slim architectural design incorporates an integral heat sink and light engine, ensuring maximum heat transfer, long LED life.
- Meets 2G vibration with knuckle mount and 3G with trunnion mount.

Optical System

- Evolve™ light engine consisting of reflective technology designed to optimize application efficiency and minimize glare.
- LM-79 tests and reports are performed in accordance with IESNA standards.
- 70 CRI at 3000K, 4000K and 5000K typical
- NEMA Distributions: 6x5, 6x6, 7x6 and 7x7.

Ratings

- cULus listed, suitable for wet locations.
- IP66 optical enclosure per ANSI C136.25-2009
- Temperature Rated at –40°C to +50°C
- Complies with the material restrictions of RoHS.

DLC Premium qualified models available. Please refer to http://www.designlights.org/QPL for complete information.

Lumen Maintenance

Ambient Temp.	Optical Code	Projected[1] 25K Hour	Projected[1] 50K Hour	Calculated[2] 88K Hour	Calculated[2] 100K Hour
5˚C (41˚F)	AA,BB, CC,DD,EE	0.964	0.945	0.918	0.910
10˚C (50˚F)		0.961	0.940	0.909	0.900
15˚C (59˚F)		0.958	0.934	0.899	0.888
20˚C (68˚F)		0.954	0.927	0.887	0.875
25˚C (77˚F)		0.950	0.920	0.875	0.861
35˚C (95˚F)		0.926	0.885	0.827	0.809
40˚C (104˚F)		0.914	0.863	0.790	0.768

Note: Based on 10,000 hours LM-80 data. For details, see http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/luminaires/ENERGY_STAR_Final_Lumen_Maintenance_ Guidance.pdf.

[1] In accordance with IESNA TM-21-11, Projected Values represent interpolated values based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip).

[2] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip).

Mounting

Option K

- K1 = Knuckle Slipfitter for 1.9 in. - 2.3 in. OD Tenon, with wires exiting tenon.
- K2 = Knuckle Slipfitter for 1.9 in. - 2.3 in. OD Tenon, external 3ft #14/3 power cable.

Option S

- S1 = Knuckle Slipfitter for 1.9 in. - 3.0 in. (48-76mm) OD Tenon.
- S2 = Knuckle Slipfitter for 1.9 in. - 3.0 in. (48-76mm) OD Tenon, with external 3ft #14/3 power cable.

Option V

- V1 = Knuckle Wall Mount. Lead wires exiting tenon.

Option T

- T1 = Trunnion, with external 3ft #14/3 power cable.

Finish

- Corrosion resistant polyester powder painted, minimum 2.0 mil. thickness.
- Standard colors: Dark Bronze, Black, White and Gray.
- RAL & custom colors available.

Electrical

- 120-277 VAC and 347-480 VAC available.
- System power factor is >90% and THD <20%.
- ANSI C136.41 PE Socket Standard. Light Grid compatible.
- Dimming:
  0-10V continuous dimming standard.
  DALI digital dimming available. Contact manufacturer.
- DALI compatible drivers available in 120-277 VAC.
- Surge Protection; per ANSI C136.2-2015.
  – 6kV/3kA “Basic” surge protection, standard.
  – 10kV/5kA “Enhanced” surge protection, optional.
- EMI: Title 47 CFR Part 15 Class A

Warranty

- 5yr standard warranty

Accessories

- Top & Side Visor
- Wire Guard
- Vandal Shield
- Barn Door Assembly

Ordering Number Logic

Evolve™ LED High Output Flood Light (EFH1)

EFH1 01 _ __ __ 7 __ _ _ __ ____ ___

PROD. ID	GENERATION	VOLTAGE	OPTICAL CODE	DISTRIBUTION	CRI	CCT	DIMMING	CONTROLS	MOUNTING	FINISH	OPTIONS
E = Evolve **FH** = Flood H-Series **1** = Standard	**01** = 1st Generation	**0** = 120-277* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* * Not available with Fusing, Must choose a discrete voltage with F Option.		**65** = NEMA 6x5 **66** = NEMA 6x6 **76** = NEMA 7x6 **77** = NEMA 7x7	**7** = 70 (min)	**30** = 3000K **40** = 4000K **50** = 5000K	**A** = ANSI C136.41 7-pin Receptacle++ **D** = External Dimming 18/2 3ft cable+ **N** = Non-Dimmable+ **P** = External Dimming 18/2 3ft cable with 7-pin Receptacle++ + No PE Receptacle (Unrestricted Aiming Angle). ++ All Units with option A and P have restricted Aiming Angle.	**A** = No Control **D** = Shorting Cap Contact manufacturer for dimming PE and standard PE control options. Must order separately.	**K1** = Knuckle Slipfitter for 1.9 in. - 2.3 in. OD Tenon.* **S1** = Knuckle Slipfitter for 1.9 in. - 3.0 in. (48-76mm) OD Tenon. **K2** = Knuckle Slipfitter for 1.9 in. - 2.3 in. OD Tenon, with external 3ft #14/3 power cable. **S2** = Knuckle Slipfitter for 1.9 in. - 3.0 in. (48-76mm) OD Tenon, with external 3ft #14/3 power cable. **V1** = Knuckle Wall Mount* **T1** = Trunnion, with external 3ft #14/3 power cable. * Lead wires exiting tenon.	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze **WHTE** = White	**F** = Fusing **L** = Tool-Less Entry **R** = Enhanced Surge Protection (10kV/5kA) **M** = NOM31* **U** = Universal DALI digital dimming+# **V** = 3-postion Terminal Block **XXX** = Special Options * Contact manufacturer + Compatible with Light Grid 2.0 nodes. # Not compatible at 347-480V.

OPTICAL CODE	DISTRIBUTION CODE	NEMA CLASSIFICATION	TYPICAL INITIAL LUMENS 3000K	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 5000K	TYPICAL SYSTEM WATTAGE 120-277V 347-480V	IES FILE NUMBER 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 5000K
AA	77	7 X 7	18900	19300	19500	150	EFH101_AA77730_____.IES	EFH101_AA77740_____.IES	EFH101_AA77750_____.IES
BB	77	7 X 7	26300	26800	27100	194	EFH101_BB77730_____.IES	EFH101_BB77740_____.IES	EFH101_BB77750_____.IES
CC	77	7 X 7	29100	29700	30000	218	EFH101_CC77730_____.IES	EFH101_CC77740_____.IES	EFH101_CC77750_____.IES
DD	77	7 X 7	34000	34700	35000	266	EFH101_DD77730_____.IES	EFH101_DD77740_____.IES	EFH101_DD77750_____.IES
EE	77	7 X 7	37900	38700	39000	297	EFH101_EE77730_____.IES	EFH101_EE77740_____.IES	EFH101_EE77750_____.IES
AA	76	7 X 6	18500	18800	19000	150	EFH101_AA76730_____.IES	EFH101_AA76740_____.IES	EFH101_AA76750_____.IES
BB	76	7 X 6	25700	26200	26500	194	EFH101_BB76730_____.IES	EFH101_BB76740_____.IES	EFH101_BB76750_____.IES
CC	76	7 X 6	28400	29000	29300	218	EFH101_CC76730_____.IES	EFH101_CC76740_____.IES	EFH101_CC76750_____.IES
DD	76	7 X 6	33200	33900	34200	266	EFH101_DD76730_____.IES	EFH101_DD76740_____.IES	EFH101_DD76750_____.IES
EE	76	7 X 6	37100	37800	38100	297	EFH101_EE76730_____.IES	EFH101_EE76740_____.IES	EFH101_EE76750_____.IES
AA	66	6 X 6	18200	18600	18800	150	EFH101_AA66730_____.IES	EFH101_AA66740_____.IES	EFH101_AA66750_____.IES
BB	66	6 X 6	25400	25900	26200	194	EFH101_BB66730_____.IES	EFH101_BB66740_____.IES	EFH101_BB66750_____.IES
CC	66	6 X 6	28100	28700	29000	218	EFH101_CC66730_____.IES	EFH101_CC66740_____.IES	EFH101_CC66750_____.IES
DD	66	6 X 6	32800	33500	33800	266	EFH101_DD66730_____.IES	EFH101_DD66740_____.IES	EFH101_DD66750_____.IES
EE	66	6 X 6	36600	37400	37700	297	EFH101_EE66730_____.IES	EFH101_EE66740_____.IES	EFH101_EE66750_____.IES
AA	65	6 X 5	17300	17700	17900	150	EFH101_AA65730_____.IES	EFH101_AA65740_____.IES	EFH101_AA65750_____.IES
BB	65	6 X 5	24100	24600	24800	194	EFH101_BB65730_____.IES	EFH101_BB65740_____.IES	EFH101_BB65750_____.IES
CC	65	6 X 5	26700	27200	27500	218	EFH101_CC65730_____.IES	EFH101_CC65740_____.IES	EFH101_CC65750_____.IES
DD	65	6 X 5	31200	31800	32100	266	EFH101_DD65730_____.IES	EFH101_DD65740_____.IES	EFH101_DD65750_____.IES
EE	65	6 X 5	34800	35500	35800	297	EFH101_EE65730_____.IES	EFH101_EE65740_____.IES	EFH101_EE65750_____.IES

PE Accessories (to be ordered separately)

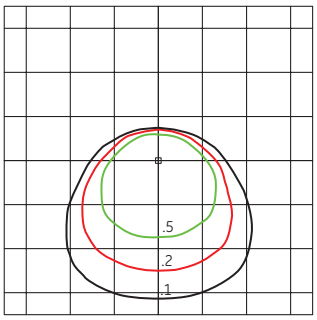
SAP Number	Part Number	Description
93029237	PED-MV-LED-7	ANSI C136.41 Dimming PE, 120-277V
93029238	PED-347-LED-7	ANSI C136.41 Dimming PE, 347V
93029239	PED-480-LED-7	ANSI C136.41 Dimming PE, 480V

SAP Number	Part Number	Description
28299	PEC0TL	STANDARD 120-277V
28294	PEC5TL	STANDARD 480V
80436	PECDTL	STANDARD 347V
73251	SCCL-PECTL	Shorting cap

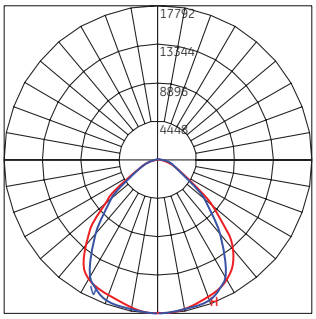
Photometrics

Evolve™ LED High Output Flood Light (EFH1)

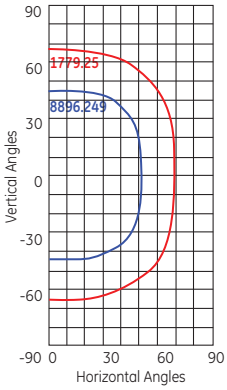
77-EE
38,700 Lumens, 4000K (EFH101_EE77740__.ies)



Grid Distance in Units of Mounting Height at 35' and 45° Tilt Initial Footcandle Values at Grade



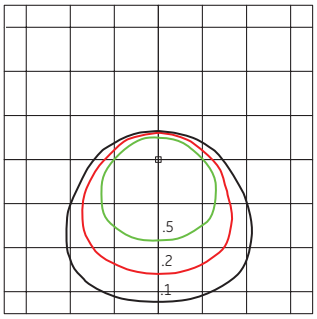
Vertical Axel Candela Distribution
Horizontal Axel Candela Distribution



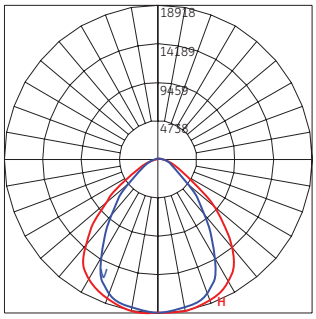
Isocandela Display

10% Max (1799.2499 Cd)
50% Max (8896.2495 Cd)

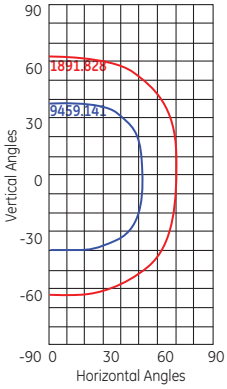
76-EE
37,800 Lumens, 4000K (EFH101_EE76740__.ies)



Grid Distance in Units of Mounting Height at 35' and 45° Tilt Initial Footcandle Values at Grade



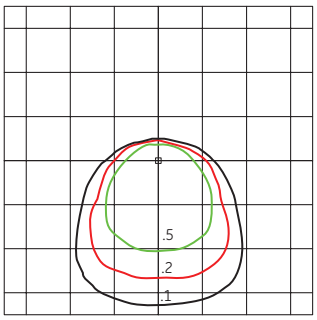
Vertical Axel Candela Distribution
Horizontal Axel Candela Distribution



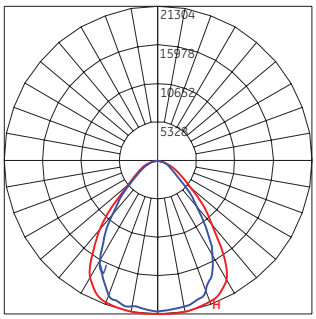
Isocandela Display

10% Max (1891.8282 Cd)
50% Max (9459.141 Cd)

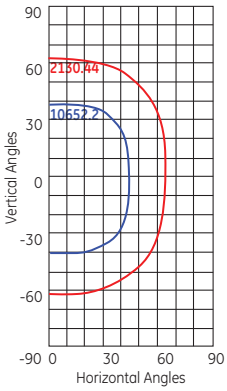
66-EE
37,400 Lumens, 4000K (EFH101_EE66740__.ies)



Grid Distance in Units of Mounting Height at 35' and 45° Tilt Initial Footcandle Values at Grade



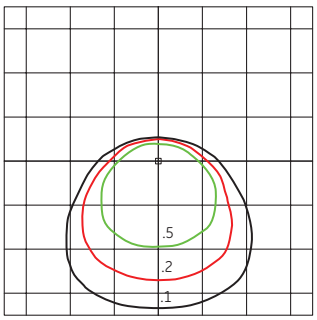
Vertical Axel Candela Distribution
Horizontal Axel Candela Distribution



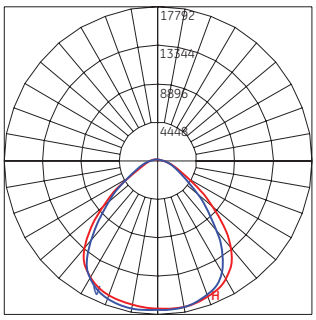
Isocandela Display

10% Max (2130.4402 Cd)
50% Max (10652.201 Cd)

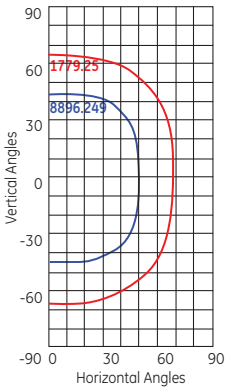
65-EE
35,500 Lumens, 4000K (EFH101_EE65740__.ies)



Grid Distance in Units of Mounting Height at 35' and 45° Tilt Initial Footcandle Values at Grade



Vertical Axel Candela Distribution
Horizontal Axel Candela Distribution



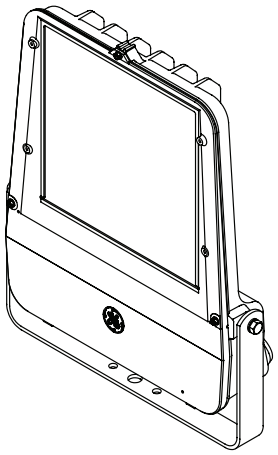
Isocandela Display

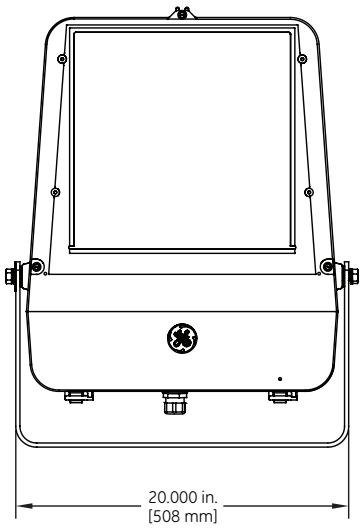
10% Max (1779.2499 Cd)
50% Max (8896.2495 Cd)

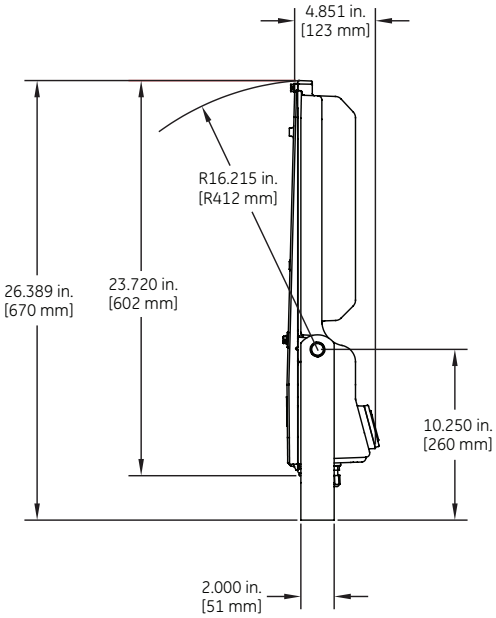
Product Dimensions

Evolve™ LED High Output Flood Light (EFH1)

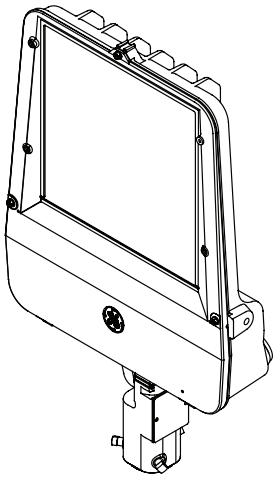
Trunnion Mounting

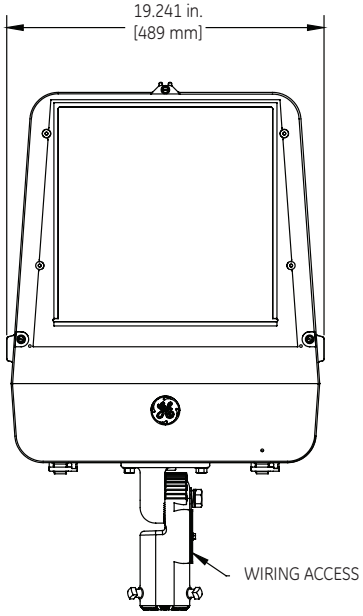


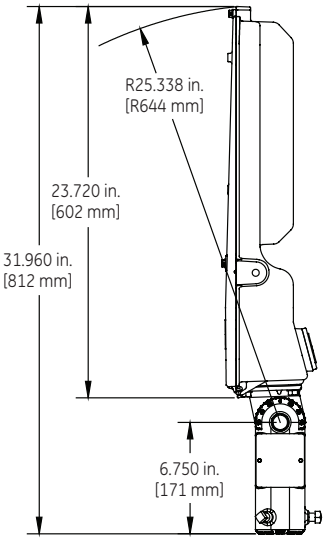




Slipfitter Mounting



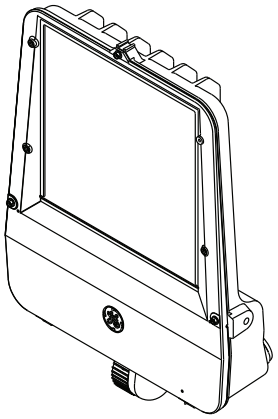


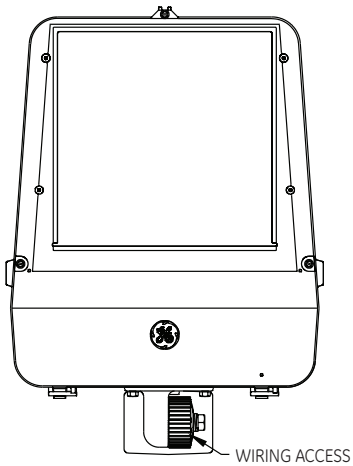


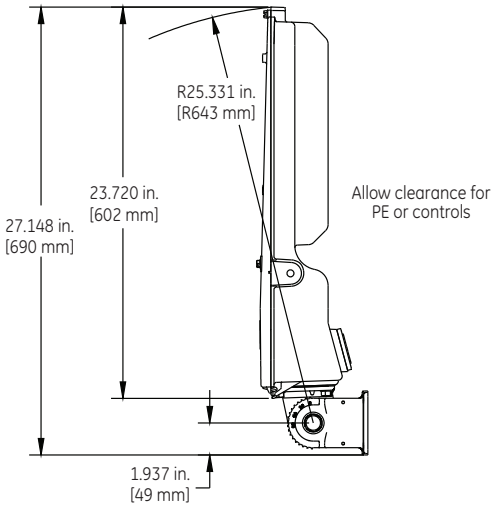
Product Dimensions

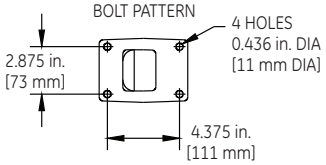
Evolve™ LED High Output Flood Light (EFH1)

Wall Mounting

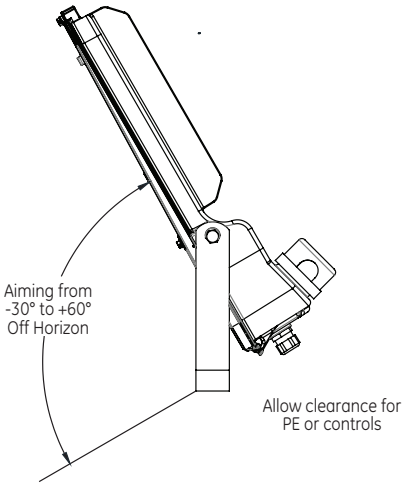




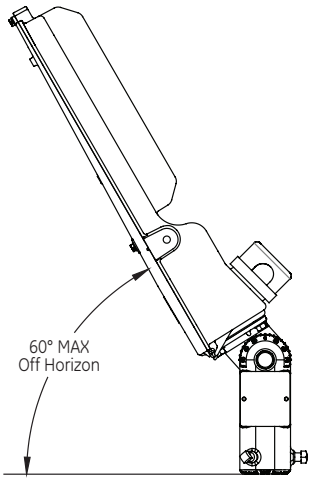




PE Aiming Restrictions



Trunnion Mount



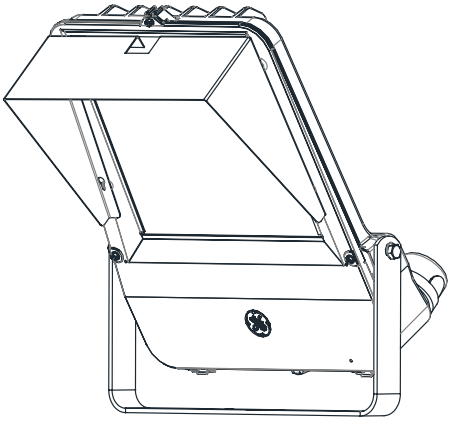
Slipfitter Mount

DATA

- Approximate net weight: 35 lbs (15.9 kgs)
- Effective Projected Area:
  - Vertical 3.51 sq ft (0.33 sq M) (aimed at horizon)
  - Tilted 1.79 sqft (0.17 sq M) (aimed down 45 degrees)

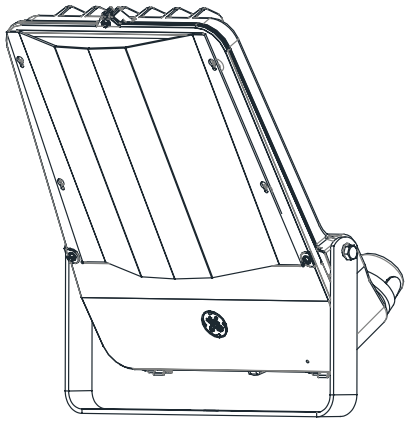
Accessories

Evolve™ LED High Output Flood Light (EFH1)



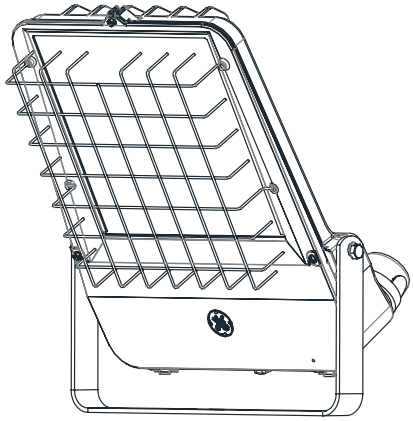
Top And Side Visor

Ordering Logic: TSVGRAY-EFH
TSVBLCK-EFH
TSVDKBZ-EFH
TSVWHTE-EFH



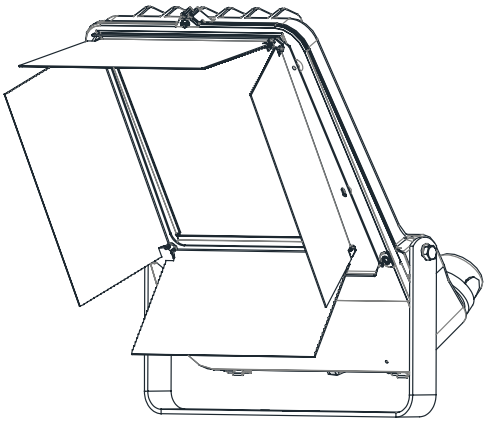
Vandal Shield

Ordering Logic: VAN-EFH



Wire Guard

Ordering Logic: WG-EFH



Barn Doors

Ordering Logic: BDAGRAY-EFH
BDABLCK-EFH
BDADKBZ-EFH
BDAWHTE-EFH

www.currentbyge.com

OLP3107 (Rev 02/20/17)

Streetworks

DESCRIPTION

The Lexington AF24 LED outdoor luminaire displays the old-fashioned charm of traditional lantern-type post top lighting, enhancing any setting with distinctive styling. As a decorative luminaire, the Lexington LED tastefully complements the architectural and environmental design of parks and roadways. It's patented AccuLED Optics™ technology delivers uniform and efficient illumination to pedestrian and roadway applications.

Catalog #		**Type**	
Project			
Comments		**Date**	
Prepared by			

SPECIFICATION FEATURES

Construction
TOP: Hinged die-cast aluminum top with cupola cover. SCREWS: Captive retaining screw. HOUSING: Die-cast aluminum base housing. Standard color is black. Other finish colors available. Consult your Streetworks representative. 1" ANSI wattage/source label.

Optics
Choice of four patented, high efficiency AccuLED Optics™ technology manufactured from injection-molded acrylic. Optics are precisely designed to shape the light output, maximizing efficiency and application spacing. AccuLED Optics technology, creates consistent distributions with the scalability to meet customized application requirements. Offered standard in 4000K (+/- 275K) CCT and minimum 70 CRI. Optional 3000K (70CRI) and 2700K (80 CRI). For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. Optics are IP66 enclosure rated. Offered open sided as a standard with four lens options.

Electrical
LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), greater than 0.9 power factor, less than 20% harmonic distortion, and is suitable for operation in -40°C to 40°C ambient environments. 10 kV/10 kA common and differential mode and 10 kV MOV surge protection available.

Mounting
Self-aligning pole-top fitter fits 2-3/8" and 3" O.D. tenons. Square headed 1-1/4" polymer coated mounting bolts.

Finish
Cast components finished in a Super durable black TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Optional colors include: bronze, grey and white. RAL and custom color matches available.

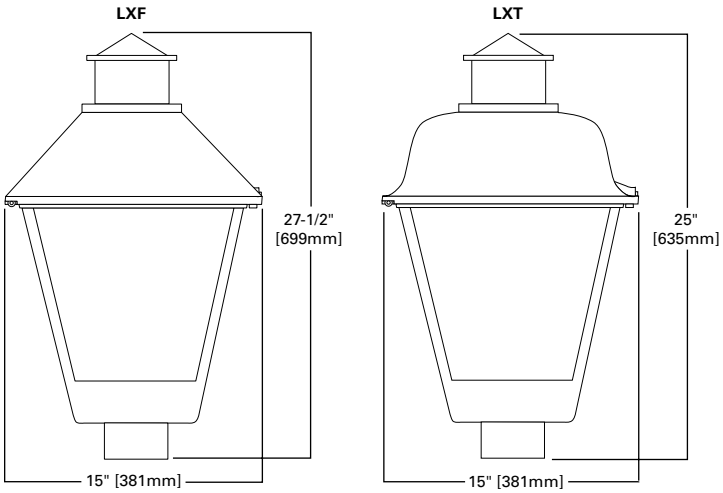
Warranty
Five-year warranty.

LXF/LXT
LEXINGTON LED

AF24
LED

DECORATIVE POST TOP LUMINAIRE

DIMENSIONS



CERTIFICATION DATA
UL/cUL Listed
ISO 9001
IP66 Rated Optics
LM79 / LM80 Compliant

ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V 50/60Hz
-30°C Minimum Temperature
40°C Ambient Temperature Rating

EPA
Effective Projected Area: (Sq. Ft.)
1.7

SHIPPING DATA
Approximate Net Wt:
20.8 lbs. (9.4 kgs.)

Powering Business Worldwide

POWER AND LUMENS

Light Engine		AF24-20	AF24-30	AF24-40	AF24-50	AF24-60	AF24-70	AF24-80	AF24-90	AF24-100
Nominal Power (Watts)		21	31	40	54	64	74	83	94	96
Wattage Label		20	30	40	50	60	70	80	90	100
Current (A) @120V		0.18	0.26	0.34	0.45	0.53	0.62	0.70	0.78	0.80
Current (A) @277V		-	0.12	0.15	0.21	0.24	0.28	0.31	0.35	0.35
Current (A) @347V		-	0.10	0.13	0.16	0.19	0.22	0.24	0.28	0.28
Current (A) @480V		-	0.07	0.09	0.13	0.14	0.17	0.18	0.21	0.21
Optics										
T2U	4000K	2,432	3,413	4,420	5,700	6,587	7,386	8,074	8,704	8,814
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
	3000K	2,153	3,021	3,913	5,046	5,831	6,538	7,147	7,705	7,802
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
T3	4000K	2,415	3,389	4,389	5,660	6,540	7,334	8,017	8,643	8,752
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
	3000K	2,138	3,000	3,885	5,011	5,789	6,492	7,097	7,651	7,747
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2
SL3	4000K	2,337	3,279	4,247	5,477	6,329	7,097	7,758	8,364	8,469
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2
	3000K	2,069	2,903	3,760	4,849	5,602	6,282	6,867	7,403	7,497
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2
T4W	4000K	2,405	3,375	4,371	5,637	6,513	7,304	7,984	8,608	8,716
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
	3000K	2,129	2,988	3,869	4,990	5,766	6,465	7,067	7,619	7,715
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
5WQ	4000K	2,550	3,578	4,634	5,976	6,905	7,743	8,464	9,125	9,240
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
	3000K	2,257	3,167	4,102	5,290	6,112	6,854	7,492	8,077	8,179
	BUG Rating	B2-U0-G1	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G2

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (50,000 hours)	TM-21 Lumen Maintenance (75,000 hours)	TM-21 Lumen Maintenance (100,000 hours)	Theoretical L70 (Hours)	Theoretical L70 (Hours)
25°C-50°C	>91%	>87%	>83%	>204,000	> 450,000

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

ORDERING INFORMATION

Sample Number: LXF-AF24-20-D-U-T2U-10MSP-4N7-BK

Product Family [1]	**Light Engine** [2]	**Wattage Bucket**	**Driver**	**Voltage**	**Distribution**
LXF=Lexington **LXT**=Lexington w/Traditional Top	**AF24=**24 LED Light Engine	**20**=20W [3] **30**=30W **40**=40W **50**=50W **60**=60W **70**=70W **80**=80W **90**=90W **100**=100W	**D**=Dimming (0-10V) **5LTD**=DALI [4]	**U**=Universal (120-277V) **2**=120V [3] **8**=480V [5] **9**=347V	**T2U**=Type II Urban **T3**=Type III **SL3**=Type III w/ Spill Control **T4W**=Type IV Wide **5WQ**=Type V Square Wide

Options (Add as Suffix)	**Color**	**Accessories** (Order Separately)
10K=10kV UL 1499 Surge Protection Device **10MSP**=10kV MOV Surge Protection Device **7030**=70 CRI / 3000K CCT [6] **8027**=80 CRI / 2700K CCT [6] **4**=NEMA Photocontrol Receptacle [7] **4N7**=NEMA 7-PIN Photocontrol Receptacle **A**=White Refractive Lens Panels **CL**=Clear Lens **FL**=Frosted Lens **TL**=Textured Lens **S**=Snap Latches for Tool-less Light Replacement **J**=Factory Installed Ladder Rest **HSS**=House Side Shield [8] **HA**=High Ambient [9]	**BK**=Black **BZ**=Bronze **AP**=Grey **WH**=White	**TA1BK**=Decorative Ladder Rest for Field Installation (Black) **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=NEMA Photocontrol - 120V **OA/RA1016**=NEMA Photocontrol - Multi-Tap **OA1223**=10kV Surge Module Replacement **HS-LX-24**=Field Installed LX House Side Shield for AF24 [8]

NOTES:

1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. Standard 4000K CCT and nominal 70 CRI.
3. AF24-20 only available in 120V only.
4. Only available in universal voltage, not available with AF24-90, AF24-100.
5. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
6. Use dedicated IES files for 3000K and 2700K when performing layouts. These files are published on the Lexington product page on the website.
7. If "4" selected, dimming functionality not available, leads will be capped.
8. HSS not available with 5WQ or SL3 distribution.
9. HA not available with AF24-100 if paired with HSS option.

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

Streetworks

DESCRIPTION

Compliments roadways, parks, pedestrian walkways, and residential streets. The Utility LED Acorn illuminates and delights communities with superior LED lumen performance in a traditional, easy-to-service design that replaces 100W HPS fixtures.

Catalog #		**Type**
Project		
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

Construction
Heavy-duty cast aluminum housing and removable door. ANSI C136.31 testing compliance prevents damage from installation generated vibration. A single quarter turn fastener on the removable door provides tool-less access to wiring compartment.

Optics
GLOBE: 9" Visual Comfort textured acrylic globe is standard. Available in asymmetric or symmetric distributions. Offered standard in 4000K CCT and minimum 70 CRI.

Electrical
120-277V 50/60Hz operation. 10kV/10kA common - and differential mode surge protection available. Thermal management transfers heat rapidly away from the LED source for optimal efficiency and light output. Ambient operating temperature from -40°C to 40°C. Standard three-position tunnel type compression terminal block.

Controls
0-10V dimming driver standard. Photocontrol and After Hours Dim accessories available. Refer to control options section.

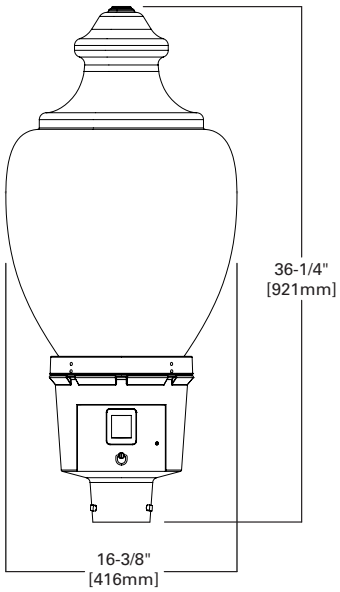
Mounting
Post top mount fits 3" O.D. tenon. Secured by square head 3/8" stainless steel mounting bolts.

Warranty
Standard five-year warranty. Optional ten-year warranty, please see your Eaton Streetworks sales representative for more information.

ULA
UTILITY LED ACORN

DECORATIVE POST TOP LUMINAIRE

DIMENSIONS



CERTIFICATION DATA
UL/cUL Listed for Fixture Mounting Heights 12 ft and greater
ANSI C136.31/C136.15
3G Vibration Rated
ISO 9001
RoHS Compliant
IP66 Rated Optics

ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V 50/60Hz
-30°C Minimum Temperature
40°C Ambient Temperature Rating

EPA
Effective Projected Area: (Sq. Ft.) 1.72

SHIPPING DATA
Approximate Net Wt:
16 lbs. (7.3 kgs.)

POWER AND LUMENS

Light Engine		A3	A4	A5	A6	A7	A8	A9
Nominal Power (Watts)		21	29	36	44	55	56	71
Wattage Label		20	30	40	40	60	60	70
Current (a) @120V		178 mA	244 mA	309 mA	379 mA	462 mA	471 mA	618 mA
Current (a) @277V		90 mA	128 mA	158 mA	192 mA	235 mA	240 mA	271 mA
Optics								
SYM	4000K	3,295	4,070	4,998	5,951	7,032	8,423	9,549
	BUG Rating	B1-U5-G2	B1-U5-G3	B1-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3
	3000K	3,183	3,931	4,828	5,748	6,793	8,136	9,224
	BUG Rating	B1-U5-G2	B1-U5-G2	B1-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3
	2700K	3,024	3,735	4,586	5,461	6,453	7,729	8,762
	BUG Rating	B1-U5-G2	B1-U5-G2	B1-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3	B2-U5-G3

Light Engine		A3	A4	A5	A6	A7	A8	A9
Nominal Power (Watts)		21	30	37	46	56	57	71
Wattage Label		20	30	40	50	60	60	70
Current (a) @120V		182 mA	250 mA	314 mA	390 mA	475 mA	480 mA	618 mA
Current (a) @277V		81 mA	118 mA	144 mA	173 mA	212 mA	214 mA	271 mA
Optics								
ASYM	4000K	3,122	3,866	4,687	5,488	6,357	7,989	9,057
	BUG Rating	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G4	B1-U5-G4
	3000K	3,016	3,734	4,527	5,301	6,140	7,717	8,749
	BUG Rating	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G4	B1-U5-G4
	2700K	2,865	3,548	4,301	5,036	5,833	7,331	8,311
	BUG Rating	B1-U5-G2	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B1-U5-G3	B2-U5-G3

LUMEN MAINTENANCE

Light Engine	Ambient Temperature	TM-21 Lumen Maintenance (60,000 hours)	Theoretical L70 (Hours)
ULA-A8-D-U-ASYM	40°C	>73%	71,000
ULA-A5-D-U-ASYM	40°C	>85%	139,000

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96

ORDERING INFORMATION

Sample Number: ULA-A5-D-U-ASYM-VM-9-7030-4N7-10MSP-W-BK

Product Family [1]	Light Engine	Driver	Voltage	Distribution	Globe
ULA=Utility LED Acorn	**A3** **A4** **A5** **A6** **A7** **A8** **A9**	**D**=Dimming **5LTD**=DALI	**U**=Universal (120-277V)	**SYM**=Symmetric **ASYM**=Asymmetric	**VM-9**=Visual Comfort / Milky Globe, 9" Neck **VM-8**=Visual Comfort / Milky Globe, 8" Neck

Options (Add as Suffix)	**Color**	**Accessories** (Order Separately)
7030=70 CRI / 3000K [2] **7027**=70 CRI / 2700K [2] **4**=NEMA Photocontrol Receptacle (Internal Mount) [3] **4N7**=NEMA 7-PIN Photocontrol Receptacle (Internal Mount) [3] **10K**=10kV UL 1449 Surge Protective Device **10MSP**=10kV MOV Surge Protective Device **NPC**=NEMA Photocontrol - Multi-Tap **PSC**=Photocontrol Shorting Cap **HSS**=House Side Shield 180 Degree Cutoff [4] **W**=20' #10 Leads **HA**=High Ambient [5]	**AP**=Grey **BK**=Black **BZ**=Bronze **WH**=White **GN**=Green	**OA/RA1016**=NEMA Photocontrol - Multi-Tap **OA/RA1013**=Photocontrol Shorting Cap **OA1223**=10kV/10kA UL 1449 Surge Module Replacement **ULA-HSS**=Field Install House Side Shield 180 Degree Cutoff [4]

NOTES:

1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. Use dedicated IES files for various CCTs and CRIs when performing layouts. These files are published on the Utility LED Acorn luminaire product page on the website.
3. Total height of photocontrol/node cannot exceed 4.3".
4. Applicable for asymmetric distribution.
5. Not available with A8 light engine.

GE Evolve™
LED Area Lighting
EALS-03 & EALP-03

current
powered by GE

Product Features

The **EAL Area Light** luminaires offer a wide range of optical patterns, color temperatures, lumen packages, and mounting configurations to optimize area light applications, as well as provide versatility in lighting design within the same form-factor. They are ideal for commercial property site-lighting applications such as retail and commercial exteriors. The EALS (standard) area light has a lumen range from 7,500-30,000 lumens. The EALP (premium) offers a similar lumen range of 25,000 to 70,000 lumens but with higher LPW and better lumen maintenance.

Both the **EALS-03** and **EALP-03** feature our innovative, highly flexible Universal Mounting Arm option, which provides installers the ability to mount the EAL fixtures on both round and square poles of multiple sizes. In addition, it features both in-line and offset bolt patterns which enable it to easily be affixed to the majority of the bolt patterns one would encounter in the field.

Applications

- Site and area light applications such as parking lots, retail exteriors, commercial exteriors, roadways and other general lighting applications

Housing

- Slim architectural design incorporates an integral heat sink and light engine, ensuring maximum heat transfer, and long LED life.
- Die cast aluminum housing
- 3G vibration per ANSI C136.31-2010

LED & Optical Assembly

- LM-79 tests and reports in accordance with IESNA standards
- Upward Light Output Ratio (ULOR) = 0 (horizontal orientation)
- 70CRI at 3000K, 4000K and 5000K
- Distributions: II, III, IV, V

Lumen Maintenance

- Projected Lxx per IES TM-21 at 25 °C for reference:

EALS03 Optical code	Lxx (10k) @ Hours 25,000 hr	50,000 hr	100,000 hr
C2, C3, C4, C5, D2, D3, D4, D5	L95	L92	L86
F5, H2, H3, H4, H5	L95	L92	L86
F2, F3, F4, J2, J3, J4, J5	L94	L89	L81
K2, K3, K4, K5	L94	L89	L81

EALP03 Optical code	Lxx (10k) @ Hours 25,000 hr	50,000 hr	100,000 hr
J5, K2, K3, K4, K5	L97	L96	L94
L2, L3, L4, L5, M2, M3, M4, M5	L97	L96	L94
J2, J3, J4, N2, N3, N4, N5	L94	L91	L84
P2, P3, P4, P5, Q2, Q3, Q4, Q5	L94	L91	L84

Note: 1) Projected Lxx based on LM80 (10,000 hour testing). 2) DOE Lighting Facts Verification Testing Tolerances apply to initial luminous flux and lumen maintenance measurements

Lumen Ambient Temperature Factors:

Ambient Temp (°C)	Initial Flux Factor
10	1.02
20	1.01
25	1.00
30	0.99
40	0.98

DLC Standard qualified models available. Please refer to http://www.designlights.org/QPL for complete information.

DLC Premium qualified models available. Please refer to http://www.designlights.org/QPL for complete information.

Ratings

- cUL Listed
- UL 1598 Listed Suitable for Wet Locations
- IP65 optical enclosure per ANSI C136.25-2013
- Operating Temperature –40°C to +40°C (maximum of +35°C for 570W)
- California Title 24 compliant (w/ "H" motion sensor option)

Mounting

Option C1: Integral Slipfitter for 1.25"-2" Pipe (1.66 in. OD-2.378 in. OD) supplied with leads. +/- 5 deg adjustment for leveling.

Option D1: Universal Mounting Arm, fitted for round or square pole mounting supplied with 16/3 3ft cable.

Option K1: Knuckle Slipfitter for 1.9 in.-2.3 in. OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option S1: Knuckle Slipfitter for 2.3 in.- 3.0 in OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option V1: Knuckle Wall Mount with leads. Restricted aiming angle 0° to +45°.

Finish

- Corrosion resistant polyester powder paint, minimum thickness 2.0 mil.
- Standard colors: Black, Dark Bronze, Aluminum, Gray & White.
- RAL & custom colors available.
- Optional coastal finish available.

Electrical

- 120-277 VAC and 347-480 VAC available.
- System power factor is >90% and THD <20%.
- ANSI C136.41 7-pin dimming receptacle, standard.
- ANSI photo electric sensors (PE) available for all voltages.
- LightGrid™ compatible.
- Dimming/Occupancy:
  - Standard: 0-10V; Optional: DALI (120-277V, excluding 400 watts and above)
  - Externally wired 0-10V dimming (optional)
  - DALI digital dimming. Contact manufacturer for availability.
  - Standalone dimming occupancy sensor with ambient light sensor, option code "H".
  - Daintree occupancy sensor available.
- Surge Protection tested per ANSI C136.2-2015.
  - 6kV/3kA "Basic" surge protection, standard.
  - 10kV/5kA "Enhanced" surge protection optional.

Warranty

- 5 Year Standard

Accessories

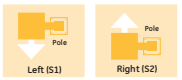
- Photoelectric Controls (see page 10)
- Light Shields (see Data Sheet OLP 3120 Shielding for EAL Area Light Fixtures)

Ordering Number Logic

Evolve™ LED Area Light (EALS-03)

EALS 03 _ __ __ 7 __ _ _ __ ____ ___

PROD. ID	GENERATION	VOLTAGE	OPTICAL DISTRIBUTION CODE	CRI	CCT	DIMMING	CONTROLS	MOUNTING ARM	COLOR	OPTIONS
E = Evolve **AL** = Area Light **S** = Standard	**03** = 3rd Generation	**0** = 120-277* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* *Not available with Fusing. Must choose a descreet voltage with F Option	**SM** = Symmetric Medium **SW** = Symmetric Wide **SH** = Symmetric High Angle **AF** = Asymmetric Forward **AH** = Asymmetric High Angle **AW** = Asymmetric Wide **AN** = Asymmetric Narrow/Auto	**7** = 70 (min)	**30** = 3000K◇ **40** = 4000K **50** = 5000K ◇Select 3000K CCT for IDA Approved units	**N** = Dimming thru PE receptacle **D** = External Dimming 18/2-3ft cable **X** = Non-dimmable* All constructions supplied with ANSI C136.41 7-pin Receptacle *Required for Cx Optical Codes. Not available for other optical codes. **Note:** Standard dimming 0-10V	**A** = ANSI 7-pin PE receptacle (no control) **D** = ANSI 7-pin PE receptacle with shorting cap provided **Note:** See accessories section on page 10 for PE Control ordering	**C1** = Integral Slipfitter for 1.25" - 2" Pipe (1.66in. OD - 2.378in. OD)* **D1** = Universal Mounting Arm, fitted for round or square pole mounting** **K1** = Knuckle Slipfitter for 1.9 in - 2.3in. OD Tenon*++ **S1** = Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon*++ **V1** = Knuckle Wall Mount*++ * Supplied with 3FT leads ** Supplied with 3FT #14/3 power cable ++ Restricted Aiming Angle 0° to +45°	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze **WHTE** = White	**F** = Fusing **H** = Motion Sensor (Sensor Switch) **H2** = Motion Sensor (Daintree) **J** = cUL/Canada **L** = Tool-Less Entry **R** = Enhanced Surge Protection (10kV/5kA) **S1** = Rotated Left † **S2** = Rotated Right † **T** = Elevated Surge Protection (20kV/10kA) **U** = DALI dimming ^+ **V** = 3-Position Terminal Block **Y** = Coastal Finish **XXX** = Special Options * Contact Manufacturer for availability + Compatible with LightGrid 2.0 nodes ^ Not compatible at 347-480V or with motion sensor control † For aimed left or right light distribution orientation, as assembled in manufacturing. Not applicable for Symmetric Distributions. **Note:** H2 option not available at 370V-480V

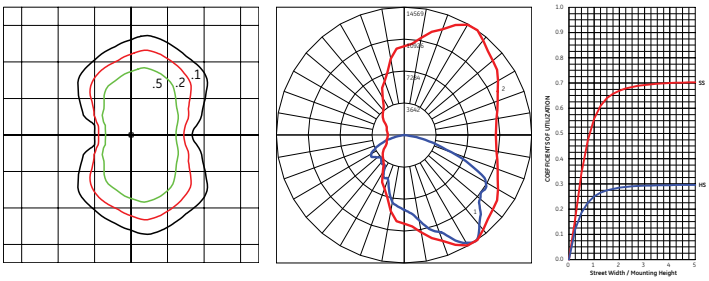


TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS 3000K	TYPICAL INITIAL LUMENS 4000K & 5000K	TYPICAL SYSTEM WATTAGE 120-277V & 347-480V	BUG RATING 3000K B-U-G	BUG RATING 4000 & 5000K B-U-G	IES FILE NUMBER 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 5000K
Type V	C5	Symmetric Medium (SM)	7300	7500	46	B3-U0-G1	B3-U0-G1	EALS03_C5SM730_.IES	EALS03_C5SM740_.IES	EALS03_C5SM750_.IES
	D5	Symmetric Medium (SM)	9800	10000	64	B3-U0-G1	B3-U0-G1	EALS03_D5SM730_.IES	EALS03_D5SM740_.IES	EALS03_D5SM750_.IES
	F5	Symmetric Medium (SM)	14700	15000	101	B4-U0-G2	B4-U0-G2	EALS03_F5SM730_.IES	EALS03_F5SM740_.IES	EALS03_F5SM750_.IES
	H5	Symmetric Medium (SM)	19600	20000	140	B4-U0-G2	B4-U0-G2	EALS03_H5SM730_.IES	EALS03_H5SM740_.IES	EALS03_H5SM750_.IES
	J5	Symmetric Medium (SM)	24500	25000	186	B4-U0-G2	B4-U0-G2	EALS03_J5SM730_.IES	EALS03_J5SM740_.IES	EALS03_J5SM750_.IES
	K5	Symmetric Medium (SM)	29400	30000	239	B5-U0-G3	B5-U0-G3	EALS03_K5SM730_.IES	EALS03_K5SM740_.IES	EALS03_K5SM750_.IES
	C5	Symmetric Wide (SW)	7300	7500	46	B2-U0-G1	B2-U0-G1	EALS03_C5SW730_.IES	EALS03_C5SW740_.IES	EALS03_C5SW750_.IES
	D5	Symmetric Wide (SW)	9800	10100	64	B3-U0-G1	B3-U0-G1	EALS03_D5SW730_.IES	EALS03_D5SW740_.IES	EALS03_D5SW750_.IES
	F5	Symmetric Wide (SW)	14700	15100	101	B3-U0-G2	B3-U0-G2	EALS03_F5SW730_.IES	EALS03_F5SW740_.IES	EALS03_F5SW750_.IES
	H5	Symmetric Wide (SW)	19700	20200	140	B4-U0-G2	B4-U0-G2	EALS03_H5SW730_.IES	EALS03_H5SW740_.IES	EALS03_H5SW750_.IES
	J5	Symmetric Wide (SW)	24600	25200	186	B4-U0-G2	B4-U0-G2	EALS03_J5SW730_.IES	EALS03_J5SW740_.IES	EALS03_J5SW750_.IES
	K5	Symmetric Wide (SW)	29600	30300	239	B5-U0-G2	B5-U0-G2	EALS03_K5SW730_.IES	EALS03_K5SW740_.IES	EALS03_K5SW750_.IES
	C5	Symmetric High Angle (SH)	7000	7200	46	B3-U0-G1	B3-U0-G1	EALS03_C5SH730_.IES	EALS03_C5SH740_.IES	EALS03_C5SH750_.IES
	D5	Symmetric High Angle (SH)	9400	9600	64	B3-U0-G2	B3-U0-G2	EALS03_D5SH730_.IES	EALS03_D5SH740_.IES	EALS03_D5SH750_.IES
	F5	Symmetric High Angle (SH)	14200	14500	101	B4-U0-G2	B4-U0-G2	EALS03_F5SH730_.IES	EALS03_F5SH740_.IES	EALS03_F5SH750_.IES
	H5	Symmetric High Angle (SH)	18900	19300	140	B4-U0-G2	B4-U0-G2	EALS03_H5SH730_.IES	EALS03_H5SH740_.IES	EALS03_H5SH750_.IES
	J5	Symmetric High Angle (SH)	23600	24100	186	B5-U0-G3	B5-U0-G3	EALS03_J5SH730_.IES	EALS03_J5SH740_.IES	EALS03_J5SH750_.IES
	K5	Symmetric High Angle (SH)	28400	29000	239	B5-U0-G3	B5-U0-G3	EALS03_K5SH730_.IES	EALS03_K5SH740_.IES	EALS03_K5SH750_.IES
Type IV	C4	Asymmetric Forward (AF)	7300	7500	50	B1-U0-G2	B1-U0-G2	EALS03_C4AF730_.IES	EALS03_C4AF740_.IES	EALS03_C4AF750_.IES
	D4	Asymmetric Forward (AF)	9800	10000	70	B2-U0-G2	B2-U0-G2	EALS03_D4AF730_.IES	EALS03_D4AF740_.IES	EALS03_D4AF750_.IES
	F4	Asymmetric Forward (AF)	14700	15000	116	B2-U0-G2	B2-U0-G2	EALS03_F4AF730_.IES	EALS03_F4AF740_.IES	EALS03_F4AF750_.IES
	H4	Asymmetric Forward (AF)	19600	20000	140	B3-U0-G3	B3-U0-G3	EALS03_H4AF730_.IES	EALS03_H4AF740_.IES	EALS03_H4AF750_.IES
	J4	Asymmetric Forward (AF)	24500	25000	186	B3-U0-G3	B3-U0-G3	EALS03_J4AF730_.IES	EALS03_J4AF740_.IES	EALS03_J4AF750_.IES
	K4	Asymmetric Forward (AF)	29400	30000	239	B3-U0-G4	B3-U0-G4	EALS03_K4AF730_.IES	EALS03_K4AF740_.IES	EALS03_K4AF750_.IES
	C4	Asymmetric High Angle (AH)	7000	7200	50	B2-U0-G2	B2-U0-G2	EALS03_C4AH730_.IES	EALS03_C4AH740_.IES	EALS03_C4AH750_.IES
	D4	Asymmetric High Angle (AH)	9400	9600	70	B2-U0-G2	B2-U0-G2	EALS03_D4AH730_.IES	EALS03_D4AH740_.IES	EALS03_D4AH750_.IES
	F4	Asymmetric High Angle (AH)	14200	14500	116	B3-U0-G3	B3-U0-G3	EALS03_F4AH730_.IES	EALS03_F4AH740_.IES	EALS03_F4AH750_.IES
	H4	Asymmetric High Angle (AH)	18900	19300	140	B3-U0-G3	B3-U0-G4	EALS03_H4AH730_.IES	EALS03_H4AH740_.IES	EALS03_H4AH750_.IES
	J4	Asymmetric High Angle (AH)	23600	24100	186	B3-U0-G4	B3-U0-G4	EALS03_J4AH730_.IES	EALS03_J4AH740_.IES	EALS03_J4AH750_.IES
	K4	Asymmetric High Angle (AH)	28400	29000	239	B3-U0-G4	B3-U0-G4	EALS03_K4AH730_.IES	EALS03_K4AH740_.IES	EALS03_K4AH750_.IES
Type III	C3	Asymmetric Wide (AW)	7300	7500	50	B2-U0-G1	B2-U0-G1	EALS03_C3AW730_.IES	EALS03_C3AW740_.IES	EALS03_C3AW750_.IES
	D3	Asymmetric Wide (AW)	9800	10100	70	B2-U0-G2	B2-U0-G2	EALS03_D3AW730_.IES	EALS03_D3AW740_.IES	EALS03_D3AW750_.IES
	F3	Asymmetric Wide (AW)	14700	15100	116	B2-U0-G2	B2-U0-G2	EALS03_F3AW730_.IES	EALS03_F3AW740_.IES	EALS03_F3AW750_.IES
	H3	Asymmetric Wide (AW)	19700	20200	140	B3-U0-G2	B3-U0-G3	EALS03_H3AW730_.IES	EALS03_H3AW740_.IES	EALS03_H3AW750_.IES
	J3	Asymmetric Wide (AW)	24600	25200	186	B3-U0-G3	B3-U0-G3	EALS03_J3AW730_.IES	EALS03_J3AW740_.IES	EALS03_J3AW750_.IES
	K3	Asymmetric Wide (AW)	29600	30300	239	B3-U0-G3	B3-U0-G3	EALS03_K3AW730_.IES	EALS03_K3AW740_.IES	EALS03_K3AW750_.IES
Type II	C2	Asymmetric Narrow/Auto (AN)	7300	7500	50	B2-U0-G2	B2-U0-G2	EALS03_C2AN730_.IES	EALS03_C2AN740_.IES	EALS03_C2AN750_.IES
	D2	Asymmetric Narrow/Auto (AN)	9800	10100	70	B2-U0-G2	B2-U0-G2	EALS03_D2AN730_.IES	EALS03_D2AN740_.IES	EALS03_D2AN750_.IES
	F2	Asymmetric Narrow/Auto (AN)	14700	15100	116	B3-U0-G3	B3-U0-G3	EALS03_F2AN730_.IES	EALS03_F2AN740_.IES	EALS03_F2AN750_.IES
	H2	Asymmetric Narrow/Auto (AN)	19700	20200	140	B3-U0-G3	B3-U0-G3	EALS03_H2AN730_.IES	EALS03_H2AN740_.IES	EALS03_H2AN750_.IES
	J2	Asymmetric Narrow/Auto (AN)	24600	25200	186	B3-U0-G3	B3-U0-G3	EALS03_J2AN730_.IES	EALS03_J2AN740_.IES	EALS03_J2AN750_.IES
	K2	Asymmetric Narrow/Auto (AN)	29600	30300	239	B3-U0-G3	B3-U0-G3	EALS03_K2AN730_.IES	EALS03_K2AN740_.IES	EALS03_K2AN750_.IES

Photometrics

Evolve™ LED Area Light (EALS-03)

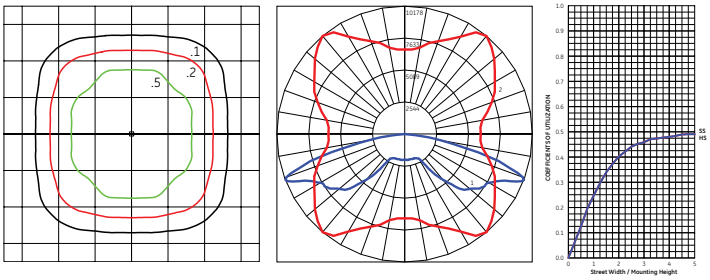
EALS Type II - Asymmetric Narrow/Auto
30,300 Lumens, 5000K (EALS03_K2AN750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 55°
— Vertical plane through horizontal angle of 34°

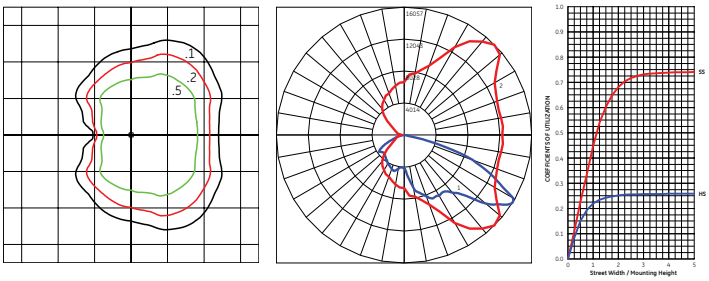
EALS Type VS - Symmetric High Angle
29,000 Lumens, 5000K (EALS03_K5SH750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 50°
— Vertical plane through horizontal angle of 69°

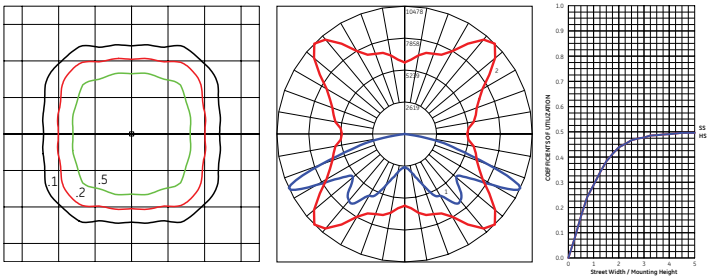
EALS Type III - Asymmetric Wide
30,300 Lumens, 5000K (EALS03_K3AW750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 58°

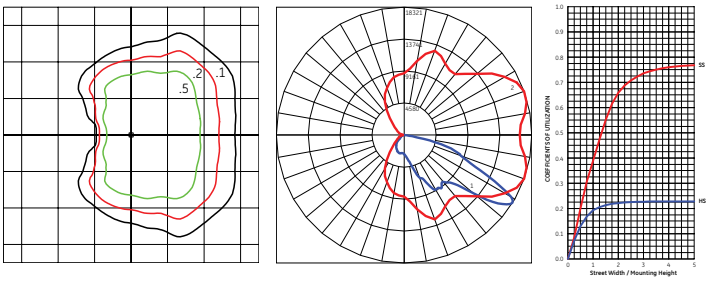
EALS Type VS - Symmetric Medium
30,000 Lumens, 5000K (EALS03_K5SM750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 65°

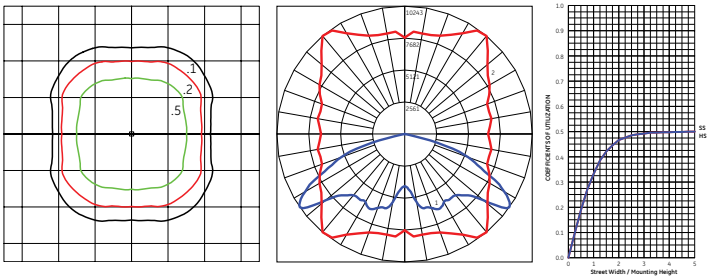
EALS Type IV - Asymmetric Forward
30,000 Lumens, 5000K (EALS03_K4AF750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 58°

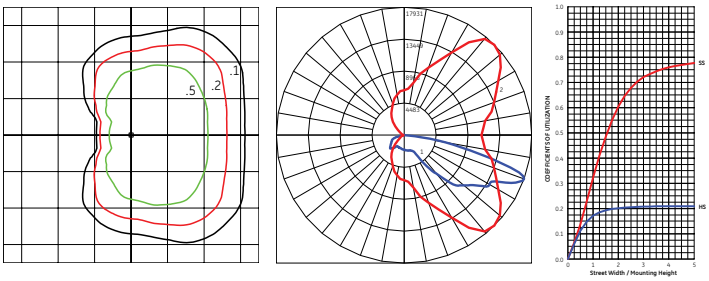
EALS Type VS - Symmetric Wide
30,300 Lumens, 5000K (EALS03_K5SW750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 50°
— Vertical plane through horizontal angle of 55°

EALS Type IV - Asymmetric High Angle
29,000 Lumens, 5000K (EALS03_K4AH750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

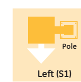
— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 70°

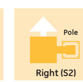
Ordering Number Logic

Evolve™ LED Area Light (EALP-03)

E A L P ____ 0 3 __ _ __ __ 7 __ _ _ __ ____ ___

PROD. ID	GENERATION	VOLTAGE	OPTICAL DISTRIBUTION CODE	CRI	CCT	DIMMING	CONTROLS	MOUNTING ARM	COLOR	OPTIONS
E = Evolve **AL** = Area Light **P** = Premium	**03** = 3rd Generation	**0** = 120-277* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 **H** = 347-480* *Not available with Fusing. Must choose a descreet voltage with F Option	**SM** = Symmetric Medium **SW** = Symmetric Wide **SH** = Symmetric High Angle **AF** = Asymmetric Forward **AH** = Asymmetric High Angle **AW** = Asymmetric Wide **AN** = Asymmetric Narrow/Auto	**7** = 70 (min)	**30** = 3000K◇ **40** = 4000K **50** = 5000K ◇Select 3000K CCT for IDA Approved units	**N** = Dimming thru PE receptacle **D** = External Dimming 18/2-3ft cable **X** = Non-dimmable* All constructions supplied with ANSI C136.41 7-pin Receptacle *Required for Cx Optical Codes. Not available for other optical codes. **Note:** Standard dimming 0-10V	**A** = ANSI 7-pin PE receptacle (no control) **D** = ANSI 7-pin PE receptacle with shorting cap provided **Note:** See accessories section on page 10 for PE Control ordering	**C1** = Integral Slip-fitter 2" Pipe (2.378 in. OD)* **D1** = Universal Mounting Arm, fitted for round or square pole mounting** **K1** = Knuckle Slipfitter for 1.9 in - 2.3in. OD Tenon*++ **S1** = Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon*++ **V1** = Knuckle Wall Mount*++ * Supplied with leads ** Supplied with 16/3 ft cable ++ Restricted Aiming Angle 0° to +45°	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze **WHTE** = White	**F** = Fusing **H** = Motion Sensor (Sensor Switch) **H2** = Motion Sensor (Daintree) **J** = cUL/Canada **L** = Tool-Less Entry **R** = Enhanced Surge Protection (10kV/5kA) **S1** = Rotated Left † **S2** = Rotated Right † **T** = Elevated Surge Protection (20kV/10kA) **U** = DALI dimming ^+ **V** = 3-Position Terminal Block **Y** = Coastal Finish **XXX** = Special Options * Contact Manufacturer for availability + Compatible with LightGrid 2.0 nodes ^ Not compatible at 347-480V, with motion sensor controls, or above 400W. † For aimed left or right light distribution orientation, as assembled in manufacturing. Not applicable for Symmetric Distributions. **Note:** H option not available for 470W and above con igurations. **Note:** H2 option not available at 370V-480V





TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS 3000K	TYPICAL INITIAL LUMENS 4000K & 5000K	TYPICAL SYSTEM WATTAGE 120-277V & 347-480V	BUG RATING 3000K B-U-G	BUG RATING 4000 & 5000K B-U-G	IES FILE NUMBER 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 5000K
Type V	J5	Symmetric Medium (SM)	23600	25000	172	B4-U0-G2	B4-U0-G2	EALP03_J5SM730_.IES	EALP03_J5SM740_.IES	EALP03_J5SM750_.IES
	K5	Symmetric Medium (SM)	28300	30000	212	B5-U0-G3	B5-U0-G3	EALP03_K5SM730_.IES	EALP03_K5SM740_.IES	EALP03_K5SM750_.IES
	L5	Symmetric Medium (SM)	33000	35000	263	B5-U0-G3	B5-U0-G3	EALP03_L5SM730_.IES	EALP03_L5SM740_.IES	EALP03_L5SM750_.IES
	M5	Symmetric Medium (SM)	37800	40000	305	B5-U0-G3	B5-U0-G4	EALP03_M5SM730_.IES	EALP03_M5SM740_.IES	EALP03_M5SM750_.IES
	N5	Symmetric Medium (SM)	47200	50000	400	B5-U0-G4	B5-U0-G4	EALP03_N5SM730_.IES	EALP03_N5SM740_.IES	EALP03_N5SM750_.IES
	P5	Symmetric Medium (SM)	56700	60000	470	B5-U0-G4	B5-U0-G4	EALP03_P5SM730_.IES	EALP03_P5SM740_.IES	EALP03_P5SM750_.IES
	Q5	Symmetric Medium (SM)	66100	70000	570	B5-U0-G5	B5-U0-G5	EALP03_Q5SM730_.IES	EALP03_Q5SM740_.IES	EALP03_Q5SM750_.IES
	J5	Symmetric Wide (SW)	23600	25000	172	B4-U0-G2	B4-U0-G2	EALP03_J5SW730_.IES	EALP03_J5SW740_.IES	EALP03_J5SW750_.IES
	K5	Symmetric Wide (SW)	28300	30000	212	B5-U0-G2	B5-U0-G2	EALP03_K5SW730_.IES	EALP03_K5SW740_.IES	EALP03_K5SW750_.IES
	L5	Symmetric Wide (SW)	33000	35000	263	B5-U0-G2	B5-U0-G2	EALP03_L5SW730_.IES	EALP03_L5SW740_.IES	EALP03_L5SW750_.IES
	M5	Symmetric Wide (SW)	37800	40000	305	B5-U0-G2	B5-U0-G2	EALP03_M5SW730_.IES	EALP03_M5SW740_.IES	EALP03_M5SW750_.IES
	N5	Symmetric Wide (SW)	47200	50000	400	B5-U0-G3	B5-U0-G3	EALP03_N5SW730_.IES	EALP03_N5SW740_.IES	EALP03_N5SW750_.IES
	P5	Symmetric Wide (SW)	56700	60000	470	B5-U0-G3	B5-U0-G3	EALP03_P5SW730_.IES	EALP03_P5SW740_.IES	EALP03_P5SW750_.IES
	Q5	Symmetric Wide (SW)	66100	70000	570	B5-U0-G4	B5-U0-G4	EALP03_Q5SW730_.IES	EALP03_Q5SW740_.IES	EALP03_Q5SW750_.IES
	J5	Symmetric High Angle (SH)	22700	24100	172	B5-U0-G3	B5-U0-G3	EALP03_J5SH730_.IES	EALP03_J5SH740_.IES	EALP03_J5SH750_.IES
	K5	Symmetric High Angle (SH)	27400	29000	212	B5-U0-G3	B5-U0-G3	EALP03_K5SH730_.IES	EALP03_K5SH740_.IES	EALP03_K5SH750_.IES
	L5	Symmetric High Angle (SH)	31900	33800	263	B5-U0-G4	B5-U0-G4	EALP03_L5SH730_.IES	EALP03_L5SH740_.IES	EALP03_L5SH750_.IES
	M5	Symmetric High Angle (SH)	36400	38600	305	B5-U0-G4	B5-U0-G4	EALP03_M5SH730_.IES	EALP03_M5SH740_.IES	EALP03_M5SH750_.IES
	N5	Symmetric High Angle (SH)	45600	48300	400	B5-U0-G4	B5-U0-G5	EALP03_N5SH730_.IES	EALP03_N5SH740_.IES	EALP03_N5SH750_.IES
	P5	Symmetric High Angle (SH)	54800	58000	470	B5-U0-G5	B5-U0-G5	EALP03_P5SH730_.IES	EALP03_P5SH740_.IES	EALP03_P5SH750_.IES
	Q5	Symmetric High Angle (SH)	63800	67600	570	B5-U0-G5	B5-U0-G5	EALP03_Q5SH730_.IES	EALP03_Q5SH740_.IES	EALP03_Q5SH750_.IES

Type IV, Type III and Type II Claims Table for EALP-03 continued on Page 6

Ordering Number Logic

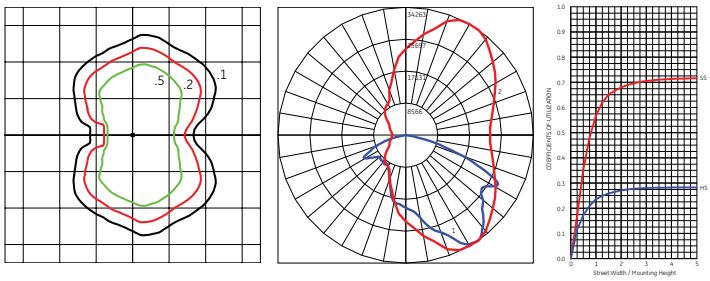
Evolve™ LED Area Light (EALP-03)

TYPE	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE	BUG RATING		IES FILE NUMBER	IES FILE NUMBER	IES FILE NUMBER
			3000K	4000K & 5000K	120-277V & 347-480V	3000K B-U-G	4000 & 5000K B-U-G	3000K	4000K	5000K
Type IV	J4	Asymmetric Forward (AF)	23600	25000	200	B3-U0-G3	B3-U0-G4	EALP03_J4AF730_.IES	EALP03_J4AF740_.IES	EALP03_J4AF750_.IES
	K4	Asymmetric Forward (AF)	28300	30000	212	B3-U0-G4	B3-U0-G4	EALP03_K4AF730_.IES	EALP03_K4AF740_.IES	EALP03_K4AF750_.IES
	L4	Asymmetric Forward (AF)	33000	35000	263	B3-U0-G4	B3-U0-G4	EALP03_L4AF730_.IES	EALP03_L4AF740_.IES	EALP03_L4AF750_.IES
	M4	Asymmetric Forward (AF)	37800	40000	305	B4-U0-G4	B4-U0-G5	EALP03_M4AF730_.IES	EALP03_M4AF740_.IES	EALP03_M4AF750_.IES
	N4	Asymmetric Forward (AF)	47200	50000	400	B4-U0-G5	B4-U0-G5	EALP03_N4AF730_.IES	EALP03_N4AF740_.IES	EALP03_N4AF750_.IES
	P4	Asymmetric Forward (AF)	56700	60000	470	B4-U0-G5	B4-U0-G5	EALP03_P4AF730_.IES	EALP03_P4AF740_.IES	EALP03_P4AF750_.IES
	Q4	Asymmetric Forward (AF)	66100	70000	570	B4-U0-G5	B4-U0-G5	EALP03_Q4AF730_.IES	EALP03_Q4AF740_.IES	EALP03_Q4AF750_.IES
	J4	Asymmetric High Angle (AH)	22700	24100	200	B3-U0-G4	B3-U0-G4	EALP03_J4AH730_.IES	EALP03_J4AH740_.IES	EALP03_J4AH750_.IES
	K4	Asymmetric High Angle (AH)	27400	29000	212	B3-U0-G4	B3-U0-G5	EALP03_K4AH730_.IES	EALP03_K4AH740_.IES	EALP03_K4AH750_.IES
	L4	Asymmetric High Angle (AH)	31900	33800	263	B4-U0-G5	B4-U0-G5	EALP03_L4AH730_.IES	EALP03_L4AH740_.IES	EALP03_L4AH750_.IES
	M4	Asymmetric High Angle (AH)	36400	38600	305	B4-U0-G5	B4-U0-G5	EALP03_M4AH730_.IES	EALP03_M4AH740_.IES	EALP03_M4AH750_.IES
	N4	Asymmetric High Angle (AH)	45600	48300	400	B4-U0-G5	B4-U0-G5	EALP03_N4AH730_.IES	EALP03_N4AH740_.IES	EALP03_N4AH750_.IES
	P4	Asymmetric High Angle (AH)	54800	58000	470	B4-U0-G5	B4-U0-G5	EALP03_P4AH730_.IES	EALP03_P4AH740_.IES	EALP03_P4AH750_.IES
	Q4	Asymmetric High Angle (AH)	63800	67600	570	B5-U0-G5	B5-U0-G5	EALP03_Q4AH730_.IES	EALP03_Q4AH740_.IES	EALP03_Q4AH750_.IES
Type III	J3	Asymmetric Wide (AW)	23600	25000	200	B3-U0-G3	B3-U0-G3	EALP03_J3AW730_.IES	EALP03_J3AW740_.IES	EALP03_J3AW750_.IES
	K3	Asymmetric Wide (AW)	28300	30000	212	B3-U0-G3	B3-U0-G3	EALP03_K3AW730_.IES	EALP03_K3AW740_.IES	EALP03_K3AW750_.IES
	L3	Asymmetric Wide (AW)	33000	35000	263	B3-U0-G3	B4-U0-G3	EALP03_L3AW730_.IES	EALP03_L3AW740_.IES	EALP03_L3AW750_.IES
	M3	Asymmetric Wide (AW)	37800	40000	305	B4-U0-G3	B4-U0-G4	EALP03_M3AW730_.IES	EALP03_M3AW740_.IES	EALP03_M3AW750_.IES
	N3	Asymmetric Wide (AW)	47200	50000	400	B4-U0-G4	B4-U0-G4	EALP03_N3AW730_.IES	EALP03_N3AW740_.IES	EALP03_N3AW750_.IES
	P3	Asymmetric Wide (AW)	56700	60000	470	B5-U0-G4	B5-U0-G4	EALP03_P3AW730_.IES	EALP03_P3AW740_.IES	EALP03_P3AW750_.IES
	Q3	Asymmetric Wide (AW)	66100	70000	570	B5-U0-G5	B5-U0-G5	EALP03_Q3AW730_.IES	EALP03_Q3AW740_.IES	EALP03_Q3AW750_.IES
Type II	J2	Asymmetric Narrow/Auto (AN)	23800	25200	200	B3-U0-G3	B3-U0-G3	EALP03_J2AN730_.IES	EALP03_J2AN740_.IES	EALP03_J2AN750_.IES
	K2	Asymmetric Narrow/Auto (AN)	28600	30300	212	B3-U0-G3	B3-U0-G3	EALP03_K2AN730_.IES	EALP03_K2AN740_.IES	EALP03_K2AN750_.IES
	L2	Asymmetric Narrow/Auto (AN)	33300	35300	263	B4-U0-G4	B4-U0-G4	EALP03_L2AN730_.IES	EALP03_L2AN740_.IES	EALP03_L2AN750_.IES
	M2	Asymmetric Narrow/Auto (AN)	38100	40400	305	B4-U0-G4	B4-U0-G4	EALP03_M2AN730_.IES	EALP03_M2AN740_.IES	EALP03_M2AN750_.IES
	N2	Asymmetric Narrow/Auto (AN)	47700	50500	400	B4-U0-G4	B4-U0-G4	EALP03_N2AN730_.IES	EALP03_N2AN740_.IES	EALP03_N2AN750_.IES
	P2	Asymmetric Narrow/Auto (AN)	57200	60600	470	B4-U0-G4	B4-U0-G4	EALP03_P2AN730_.IES	EALP03_P2AN740_.IES	EALP03_P2AN750_.IES
	Q2	Asymmetric Narrow/Auto (AN)	66800	70700	570	B5-U0-G5	B5-U0-G5	EALP03_Q2AN730_.IES	EALP03_Q2AN740_.IES	EALP03_Q2AN750_.IES

Photometrics

Evolve™ LED Area Light (EALP-03)

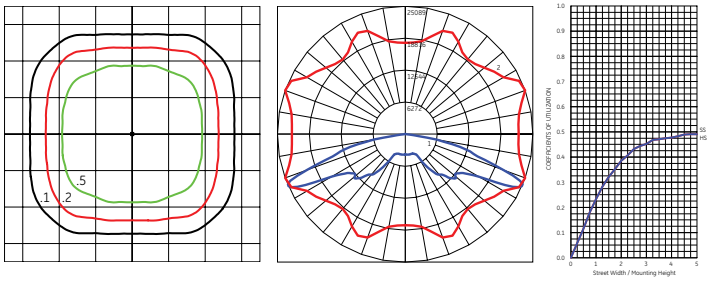
EALP Type II - Asymmetric Narrow/Auto
70,700 Lumens, 5000K (EALP03_Q2AN750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 60°
— Vertical plane through horizontal angle of 35°

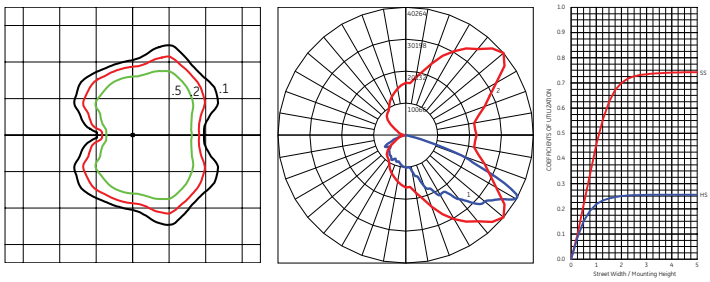
EALP Type VS - Symmetric High Angle
67,600 Lumens, 5000K (EALP03_Q5SH750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 66°

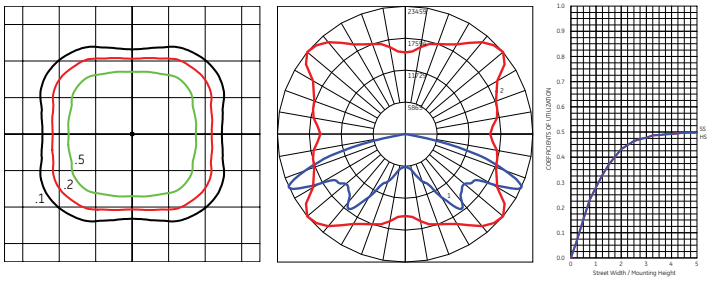
EALP Type III - Asymmetric Wide
70,000 Lumens, 5000K (EALP03_Q3AW750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 40°
— Vertical plane through horizontal angle of 61°

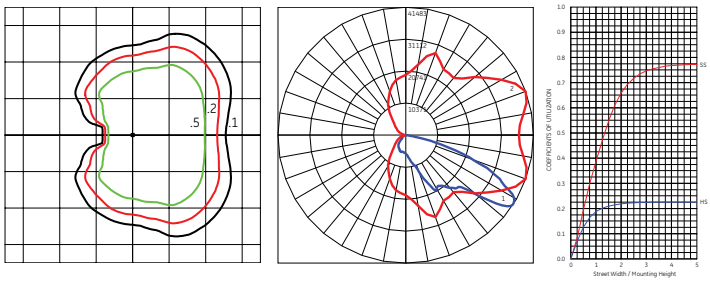
EALP Type VS - Symmetric Medium
70,000 Lumens, 5000K (EALP03_Q5SM750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 40°
— Vertical plane through horizontal angle of 65°

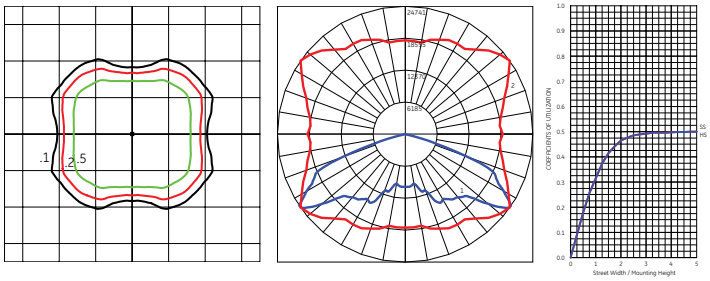
EALP Type IV - Asymmetric Forward
70,000 Lumens, 5000K (EALP03_Q4AF750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 20°
— Vertical plane through horizontal angle of 57°

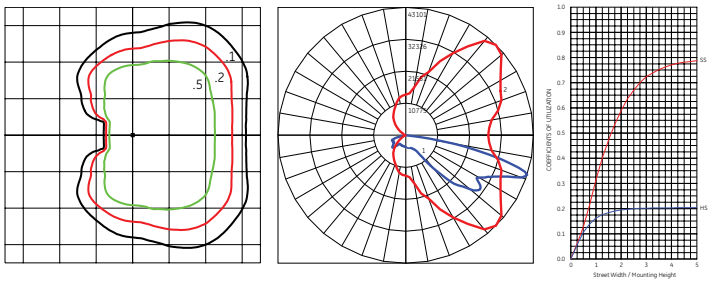
EALP Type VS - Symmetric Wide
70,000 Lumens, 5000K (EALP03_Q5SW750___.IES)



Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 35°
— Vertical plane through horizontal angle of 56°

EALP Type IV - Asymmetric High Angle
67,700 Lumens, 5000K (EALP03_Q4AH750___.IES)



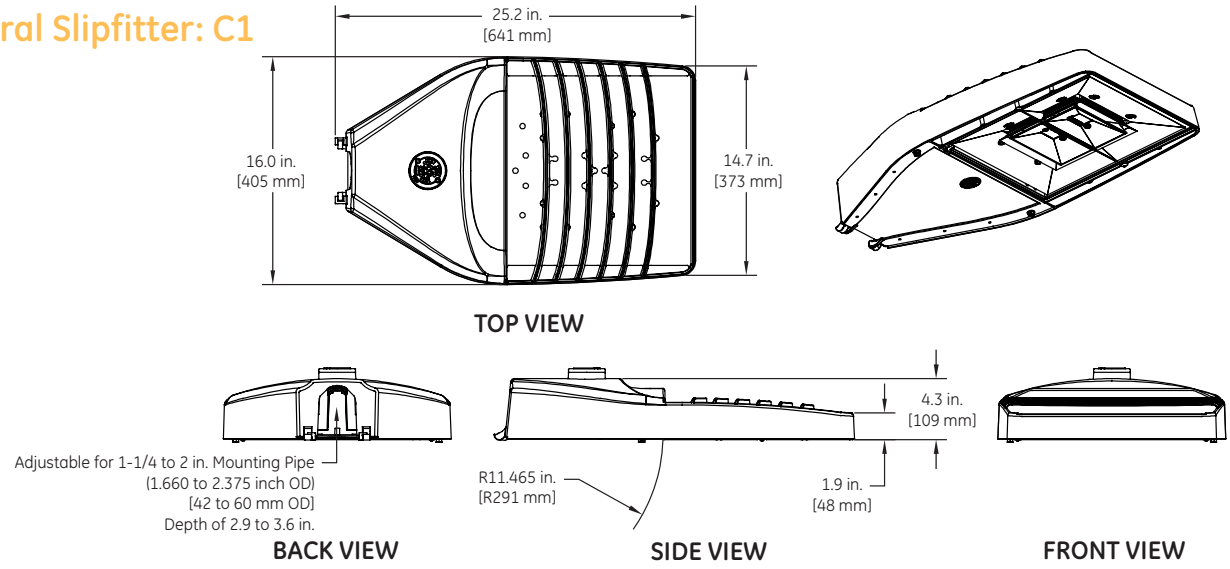
Grid Distance in Units of Mounting Height at 40' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at 45°
— Vertical plane through horizontal angle of 72°

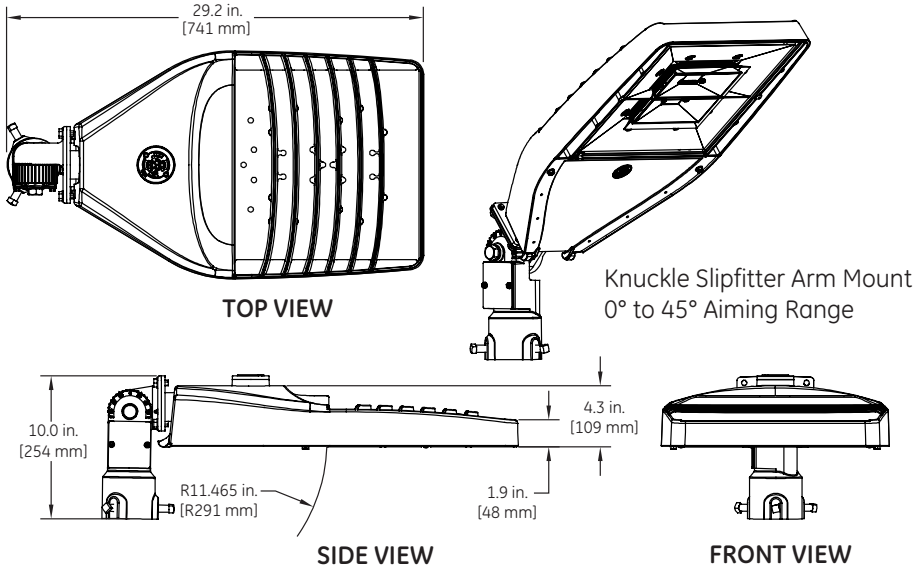
Product Dimensions

Evolve™ LED Area Light (EALS-03 & EALP-03)

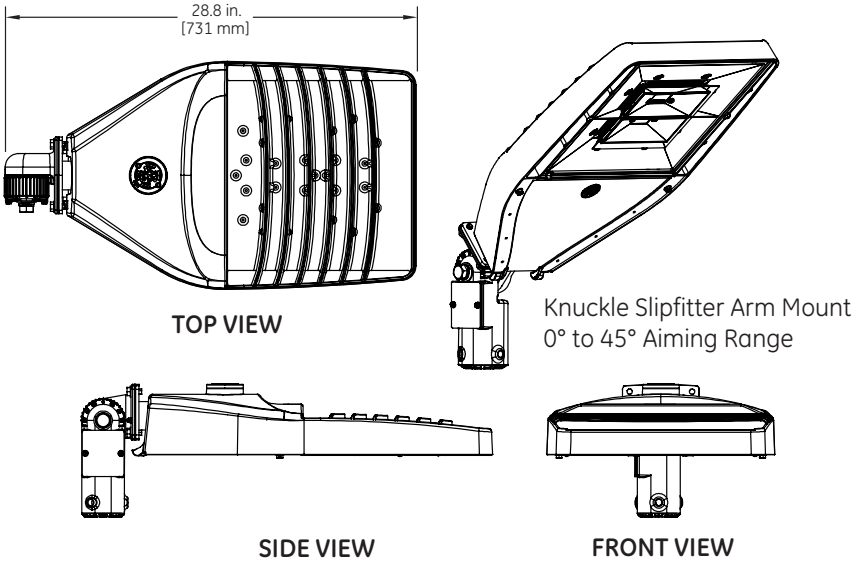
Integral Slipfitter: C1



Knuckle Slipfitter: S1



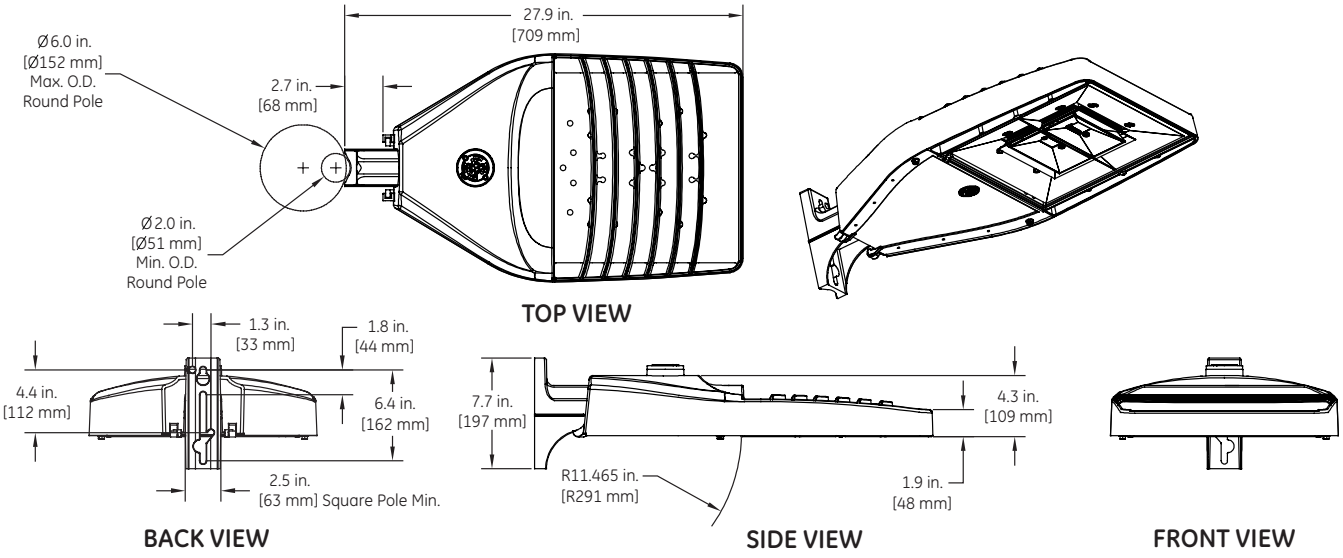
Knuckle Slipfitter: K1



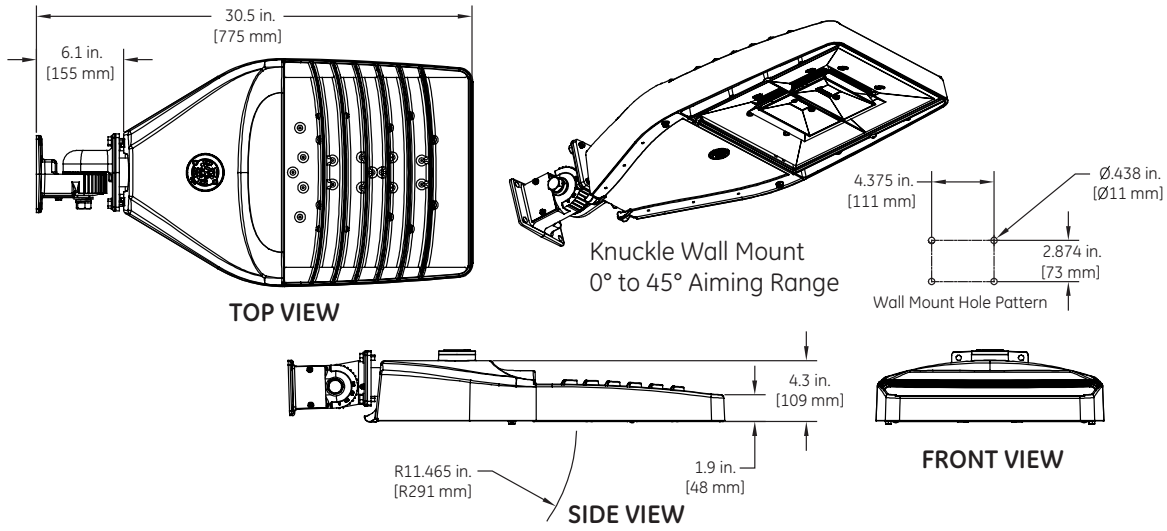
Product Dimensions

Evolve™ LED Area Light (EALS-03 & EALP-03)

Universal Mounting Arm: D1



Knuckle Wall Mount: V1



DATA

- Approximate Net Weight: 27 lbs (12.2 kg)
- Effective Projected Area:
  - Knuckle Slipfitter S1, K1 45° aim, EPA = 2.45
  - Knuckle Slipfitter S1, K1 downward aim, EPA = 0.73
  - Universal Arm Mount D1, EPA = 0.54 - Knuckle Wall Mount V1, 45° aim, EPA = 0.77 sq ft min and 1.43 sq ft max
  - Integral Slipfitter C1, EPA = 0.63

Accessories

Evolve™ LED Area Light (EALS-03 & EALP-03)

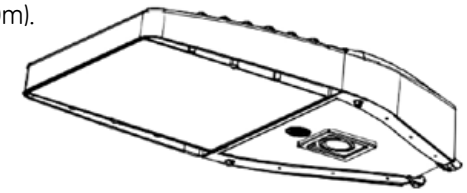
PE Accessories (to be ordered separately)

SAP Number	Part Number	Description
93029237	PED-MV-LED-7	ANSI C136.41 Dimming PE, 120-277V
93029238	PED-347-LED-7	ANSI C136.41 Dimming PE, 347V
93029239	PED-480-LED-7	ANSI C136.41 Dimming PE, 480V

SAP Number	Part Number	Description
28299	PEC0TL	STANDARD 120-277V
28294	PEC5TL	STANDARD 480V
80436	PECDTL	STANDARD 347V
73251	SCCL-PECTL	Shorting cap

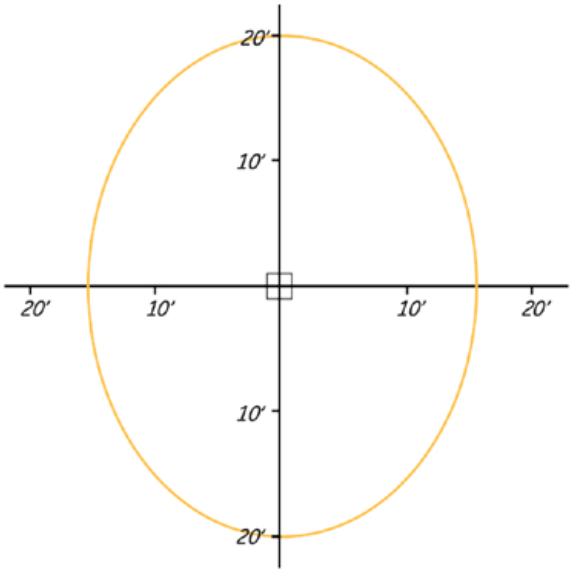
H-Motion Sensing Option

- Intended for applications, between 15-30 ft. mounting height. (4.57-9.14m).
  For mounting heights exceeding 30 ft., pole mounted sensors are recommended.
- Provides a coverage area radius for walking motion of 15-20 ft. (4.57-6.10m).
- Provides 270° of coverage (~90° is blocked by the pole).
- Standard factory settings:
  – 50% output when unoccupied, 100% output occupied.
  – Integral PE Sensor.
  – 5 minute post-occupancy time delay, 5 minute dimming ramp-down.
- Fixture power increase of 1W expected with sensor use.



Note: Standard options may be reprogrammed in the field. Reprogramming instructions included in product shipment.

Sensor Pattern



Sensing Pattern Area Fixture
Up to 30 ft. Mounting Height

Mounting Information

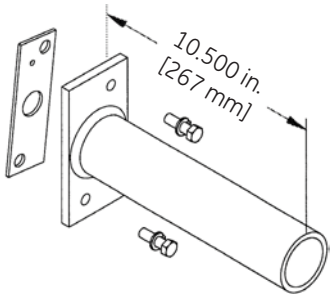
Evolve™ LED Area Light (EALS-03 & EALP-03)

Mounting Options for Integral Slipfitter - (Mounting Arm C1)

Order separately

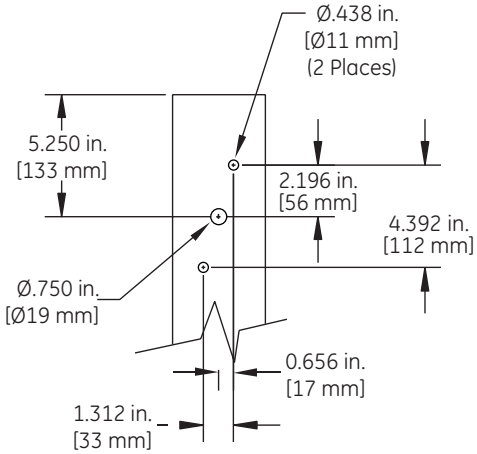
SQUARE POLE MOUNTING ARM

3.5 TO 4.5-inch (89 to 114mm) SQUARE
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



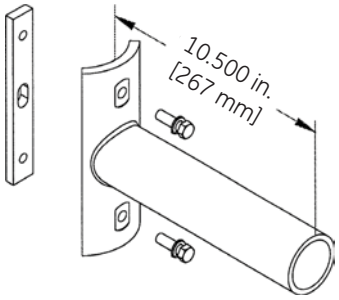
ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
SPA-EAMT10BLCK "Black"
SPA-EAMT10DKBZ "Dark Bronze"
SPA-EAMT10WHTE "White"
SPA-EAMT10GRAY "Gray"

SQUARE POLE MOUNTING DRILLING TEMPLATE



ROUND POLE MOUNTING ARM DRILLING TEMPLATE

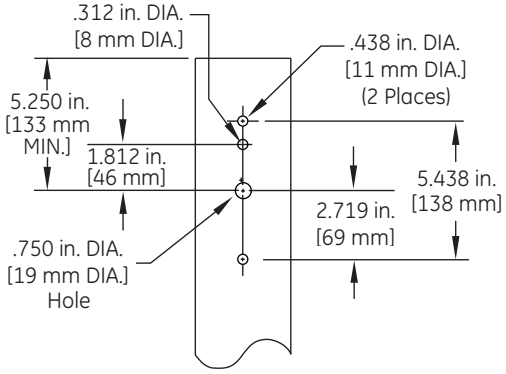
3.5 TO 4.5-inch (89 to 114mm) OD
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
RPA-EAMT10BLCK "Black"
RPA-EAMT10DKBZ "Dark Bronze"
RPA-EAMT10WHTE "White"
RPA-EAMT10GRAY "Gray"

ROUND POLE MOUNTING DRILLING TEMPLATE

3.5 TO 4.5-inch (89 to 114mm) OD
round pole mounting arm



Wall Mounting Bracket Adapter Plate

ORDER SEPERATELY FROM FIXTURE AS CATALOG NUMBER
WMB-EAMT06

***NOTE:** For Wall Mounting, order luminaire with mounting arm: C1 = Slipfitter 2" Pipe (2.378 in. OD) supplied with leads.

Other mounting patterns are available for retrofit installations.
Contact manufacturing for other available mounting patterns.

Evolve®

Compact Low Wattage Area Light

EACL

GE current
a Daintree company

Product Features

Current's EAL Series of Area Light Luminaires offer a wide range of optical patterns, color temperatures, lumen packages, and mounting configurations to optimize area light applications, as well as provide versatility in lighting design within the same form factor.

The new Compact Low Wattage Area Light (EACL) expands the range of lumen packages down to 3,000 Lumens to meet the needs of applications requiring lower lumens. The EACL is an ideal cost effective solution for smaller Commercial and Retail exterior applications requiring between 3,000 and 20,000 Lumens.

The EACL features our innovative highly flexible Universal Mounting Arm option, which provides installers the ability to mount EAL fixtures on both round and square poles of multiple sizes. In addition, it features both in-line and offset bolt patterns allowing it to easily be affixed to the majority of bolt patterns one would find in the field.

Applications

- Site and area light applications such as parking lots, retail exteriors, commercial exteriors, and other general spaces.

Housing

- Slim architectural design incorporates an integral heat sink and light engine, ensuring maximum heat transfer, and long LED life.
- Die cast aluminum housing
- 3G vibration per ANSI C136.31-2018

LED & Optical Assembly

- LM-79 tests and reports in accordance with IESNA standards
- Upward Light Output Ratio (ULOR) = 0 (horizontal orientation)
- 70 CRI at 3000K, 4000K and 5000K
- Distributions: II, III, IV

Lumen Maintenance

- Projected Lxx per IES TM-21 at 25 °C for reference:

EACL01 OPTICAL CODE	LXX(10K)@HOURS 25,000 HR	50,000 HR	60,000 HR
A2, A3, A4, B2, B3, B4, C2, C3, C4 D2, D3, D4, E2, E3, E4, F2, F3, F4	L94	L90	L88
H2,H3, H4	L97	L96	L96

NOTES: Projected Lxx based on LM80 (10,000 hour testing). Accepted industry tolerances apply to initial luminous flux and lumen maintenance measurements.

Lumen Ambient Temperature Factors:

Ambient Temp (°C)	Initial Flux Factor
10	1.02
20	1.01
25	1.00
30	0.99
40	0.98

Ratings

- IP66 optical enclosure per ANSI C136.25-2013
- Operating Temperature –40°C to +50°C
- cULus cUL Listed
- UL UL 1598 Listed Suitable for Wet Locations

Mounting

Option C1 (Standard)

- Integral Slipfitter for 1.25"-2" Pipe (1.66in. OD-2.378in. OD) supplied with leads. +/- 5 deg adjustment for leveling.

Option D1

- Universal Mounting Arm, fitted for round or square pole mounting supplied with 16/3 3ft cable.

Option K1

- Knuckle Slipfitter for 1.9 in. -2.3 in. OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option S1

- Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon with leads. Restricted aiming angle 0° to +45°.

Option V1

- Knuckle Wall Mount with leads. Restricted aiming angle 0° to +45°.

Finish

- Corrosion resistant polyester powder paint, minimum thickness 2.0 mil.
- Standard colors: Black, Dark Bronze, Gray & White.
- RAL & custom colors available.
- Optional coastal finish available.

Electrical

- 120-277 VAC and 347-480 VAC available.
- System power factor is ≥90% and THD ≤20%.*
- ANSI C136.41 7-pin dimming receptacle, optional.
- ANSI photo electric sensors (PE) for all voltages, optional.
- Dimming/Occupancy:
  - Externally wired 0-10V dimming, optional.
  - Standalone dimming occupancy sensor available
  - Daintree occupancy sensor available.
- Surge Protection per ANSI C136.2-2015.
  - 6kV/3kA "Basic" surge protection, standard.
  - 10kV/5kA "Enhanced" surge protection optional.

** System PF and THD specified at rated watts*

Warranty

- 5 Year Standard

Accessories

- See Page 7 for PE Controls and Light Shield Information

Ordering Number Logic

Evolve® Compact Low Wattage Area Light (EACL)

Project name _____

Date _____

Type _____

EACL 01 _ __ __ 7 __ _ _ __ ____ ___

PROD. ID	GENERATION	VOLTAGE	OPTICAL CODE	DISTRIBUTION	CRI	CCT	DIMMING	CONTROLS	MOUNTING ARM	COLOR	OPTIONS
E = Evolve **AC**= Compact Area Light **L** = Low Wattage	**01** = 1st Generation	**0** = 120-277* **H** = 347-480* **1** = 120 **2** = 208 **3** = 240 **4** = 277 **5** = 480 **D** = 347 * Not available with Fusing. Must choose a discrete voltage with F Option.	**AF** = Asymmetric Forward **AW** = Asymmetric Wide **AN** = Asymmetric Narrow/Auto	**7** = 70 (min)	**30** = 3000K **40** = 4000K **50** = 5000K	**N** = Dimming thru PE receptacle **D** = External Dimming 18/2-3ft cable **X** = Non-Dimmable **Note:** Standard dimming 0-10V	**1** = None **A** = ANSI 7-pin PE receptacle (no control) **D** = ANSI 7-pin PE receptacle with shorting cap provided	**C1** = Integral Slip-fitter for 1.25"- 2" Pipe (1.66in. OD - 2.378 in. OD)* **Note:** C1 Comes Standard **D1** = Universal Mounting Arm, fitted for round or square pole mounting** **K1** = Knuckle Slipfitter for 1.9 in - 2.3in. OD Tenon* ++ **S1** = Knuckle Slipfitter for 2.3in. - 3.0in OD Tenon* ++ **V1** = Knuckle Wall Mount* ++ * Supplied with 3ft leads ** Supplied with 16/3 3ft cable ++ Restricted Aiming Angle 0° to +45°	**GRAY** = Gray **BLCK** = Black **DKBZ** = Dark Bronze **WHTE** = White	**F** = Fusing **H** = Motion Sensor (Sensor Switch) **H1** = Motion Sensor w/LightGrid **H2** = Motion Sensor (Daintree) **J** = cUL/Canada **L** = Tool-Less Entry **R** = Enhanced Surge Protection (10kV/5kA) **U** = DALI dimming+^ **V** = 3-Position Terminal Block **Y** = Coastal Finish **XXX** = Special Options +Compatiable with LightGrid Wireless Control System Nodes ^Not compatible with motion sensor control

	OPTICAL CODE	DISTRIBUTION	TYPICAL INITIAL LUMENS 3000K	TYPICAL INITIAL LUMENS 4000K & 5000K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	BUG RATING 3000K B-U-G	BUG RATING 4000K & 5000K B-U-G	IES FILE NUMBER 3000K	IES FILE NUMBER 4000K	IES FILE NUMBER 5000K
TYPE IV	A4	Asymmetric Forward (AF)	2900	3000	21	23	B1-U0-G1	B1-U0-G1	EACL01_A4AF730_-120-277V.IES EACL01_A4AF730_-347-480V.IES	EACL01_A4AF740_-120-277V.IES EACL01_A4AF740_-347-480V.IES	EACL01_A4AF750_-120-277V.IES EACL01_A4AF750_-347-480V.IES
	B4		4900	5000	36	38	B1-U0-G1	B1-U0-G1	EACL01_B4AF730_-120-277V.IES EACL01_B4AF730_-347-480V.IES	EACL01_B4AF740_-120-277V.IES EACL01_B4AF740_-347-480V.IES	EACL01_B4AF750_-120-277V.IES EACL01_B4AF750_-347-480V.IES
	C4		7300	7500	55		B1-U0-G2	B1-U0-G2	EACL01_C4AF730_.IES	EACL01_C4AF740_.IES	EACL01_C4AF750_.IES
	D4		9800	10000	73		B2-U0-G2	B2-U0-G2	EACL01_D4AF730_.IES	EACL01_D4AF740_.IES	EACL01_D4AF750_.IES
	E4		12200	12500	95		B2-U0-G2	B2-U0-G2	EACL01_E4AF730_.IES	EACL01_E4AF740_.IES	EACL01_E4AF750_.IES
	F4		14700	15000	122		B2-U0-G2	B2-U0-G2	EACL01_F4AF730_.IES	EACL01_F4AF740_.IES	EACL01_F4AF750_.IES
	H4		19000	20000	153		B3-U0-G3	B3-U0-G3	EACL01_H4AF730_.IES	EACL01_H4AF740_.IES	EACL01_H4AF750_.IES
TYPE III	A3	Asymmetric Wide (AW)	2900	3000	21	23	B1-U0-G1	B1-U0-G1	EACL01_A3AW730_-120-277V.IES EACL01_A3AW730_-347-480V.IES	EACL01_A3AW740_-120-277V.IES EACL01_A3AW740_-347-480V.IES	EACL01_A3AW750_-120-277V.IES EACL01_A3AW750_-347-480V.IES
	B3		4900	5100	36	38	B1-U0-G1	B1-U0-G1	EACL01_B3AW730_-120-277V.IES EACL01_B3AW730_-347-480V.IES	EACL01_B3AW740_-120-277V.IES EACL01_B3AW740_-347-480V.IES	EACL01_B3AW750_-120-277V.IES EACL01_B3AW750_-347-480V.IES
	C3		7400	7600	55		B1-U0-G2	B1-U0-G2	EACL01_C3AW730_.IES	EACL01_C3AW740_.IES	EACL01_C3AW750_.IES
	D3		9900	10200	73		B2-U0-G2	B2-U0-G2	EACL01_D3AW730_.IES	EACL01_D3AW740_.IES	EACL01_D3AW750_.IES
	E3		12400	12700	95		B2-U0-G2	B2-U0-G2	EACL01_E3AW730_.IES	EACL01_E3AW740_.IES	EACL01_E3AW750_.IES
	F3		14900	15300	122		B2-U0-G2	B2-U0-G2	EACL01_F3AW730_.IES	EACL01_F3AW740_.IES	EACL01_F3AW750_.IES
	H3		19300	20400	153		B3-U0-G2	B3-U0-G2	EACL01_H3AW730_.IES	EACL01_H3AW740_.IES	EACL01_H3AW750_.IES
TYPE II	A2	Asymmetric Narrow/Auto (AN)	2900	3000	21	23	B1-U0-G1	B1-U0-G1	EACL01_A2AN730_-120-277V.IES EACL01_A2AN730_-347-480V.IES	EACL01_A2AN740_-120-277V.IES EACL01_A2AN740_-347-480V.IES	EACL01_A2AN750_-120-277V.IES EACL01_A2AN750_-347-480V.IES
	B2		4900	5000	36	38	B1-U0-G1	B1-U0-G1	EACL01_B2AN730_-120-277V.IES EACL01_B2AN730_-347-480V.IES	EACL01_B2AN740_-120-277V.IES EACL01_B2AN740_-347-480V.IES	EACL01_B2AN750_-120-277V.IES EACL01_B2AN750_-347-480V.IES
	C2		7300	7500	55		B2-U0-G1	B2-U0-G2	EACL01_C2AN730_.IES	EACL01_C2AN740_.IES	EACL01_C2AN750_.IES
	D2		9800	10100	73		B2-U0-G2	B2-U0-G2	EACL01_D2AN730_.IES	EACL01_D2AN740_.IES	EACL01_D2AN750_.IES
	E2		12300	12600	95		B2-U0-G2	B2-U0-G2	EACL01_E2AN730_.IES	EACL01_E2AN740_.IES	EACL01_E2AN750_.IES
	F2		14700	15100	122		B3-U0-G2	B3-U0-G3	EACL01_F2AN730_.IES	EACL01_F2AN740_.IES	EACL01_F2AN750_.IES
	H2		19100	20200	153		B3-U0-G3	B3-U0-G3	EACL01_H2AN730_.IES	EACL01_H2AN740_.IES	EACL01_H2AN750_.IES

Photometrics

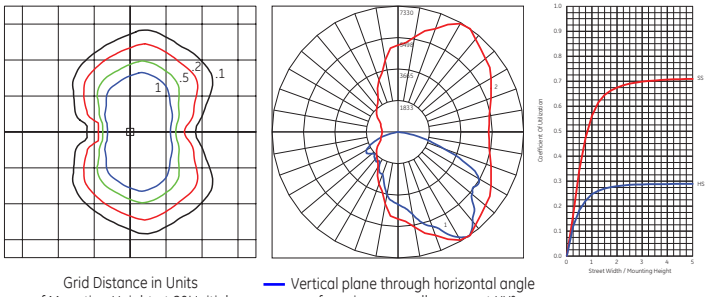
Evolve® Compact Low Wattage Area Light (EACL)

Project name _____

Date _____

Type _____

EACL Type II - Very Short
15,100 Lumens (EACL01_F2AN750___.IES)

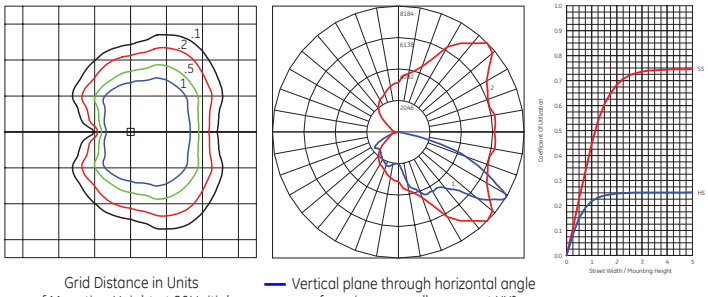


Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

— Vertical plane through horizontal angle of XX°

EACL Type III - Short
15,300 Lumens (EACL01_F3AW750___.IES)

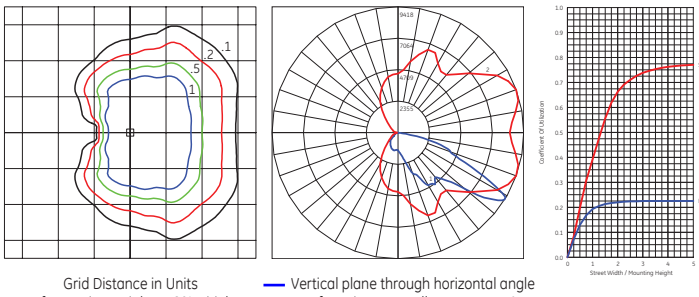


Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

— Vertical plane through horizontal angle of XX°

EACL Type III - Very Short
15,000 Lumens (EACL01_F4AF750___.IES)

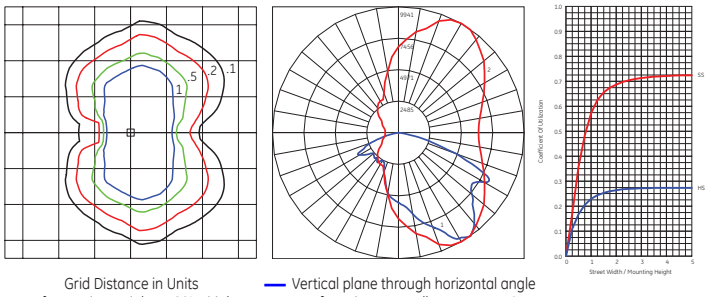


Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

— Vertical plane through horizontal angle of XX°

EACL Type II - Very Short
20,200 Lumens (EACL01_H2AN750___.IES)

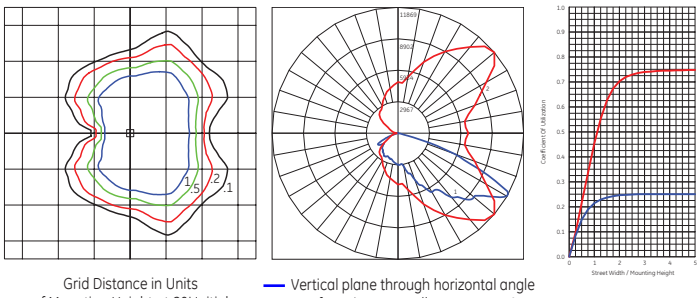


Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

— Vertical plane through horizontal angle of XX°

EACL Type III - Short
20,400 Lumens (EACL01_H3AW750___.IES)

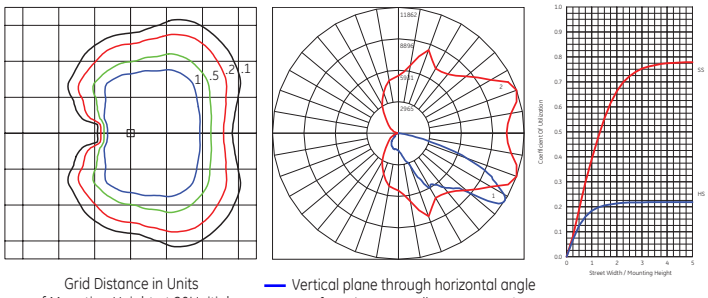


Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

— Vertical plane through horizontal angle of XX°

EACL Type IV - Very Short
20,000 Lumens (EACL01_H4AF750___.IES)



Grid Distance in Units of Mounting Height at 20' Initial Footcandle Values at Grade

— Vertical plane through horizontal angle of maximum candlepower at XX°

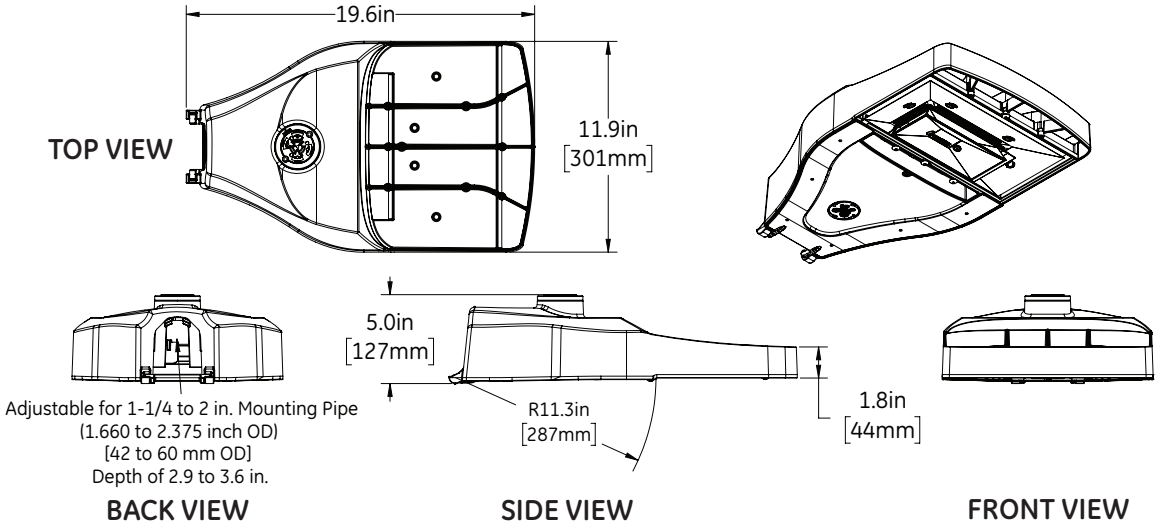
— Vertical plane through horizontal angle of XX°

Product Dimensions

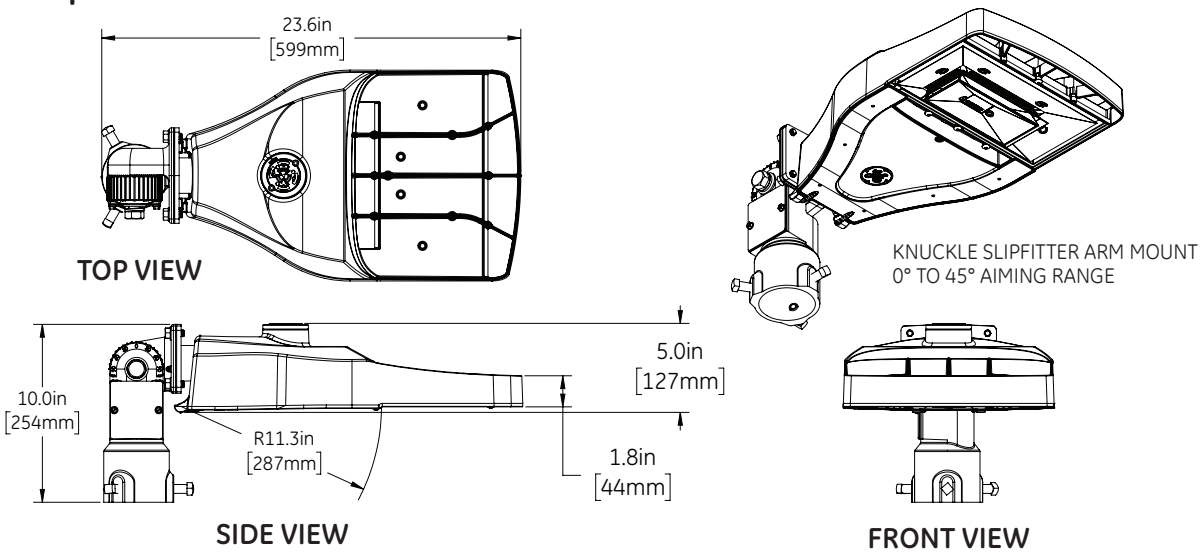
Evolve® Compact Low Wattage Area Light (EACL)

Project name _____
Date _____
Type _____

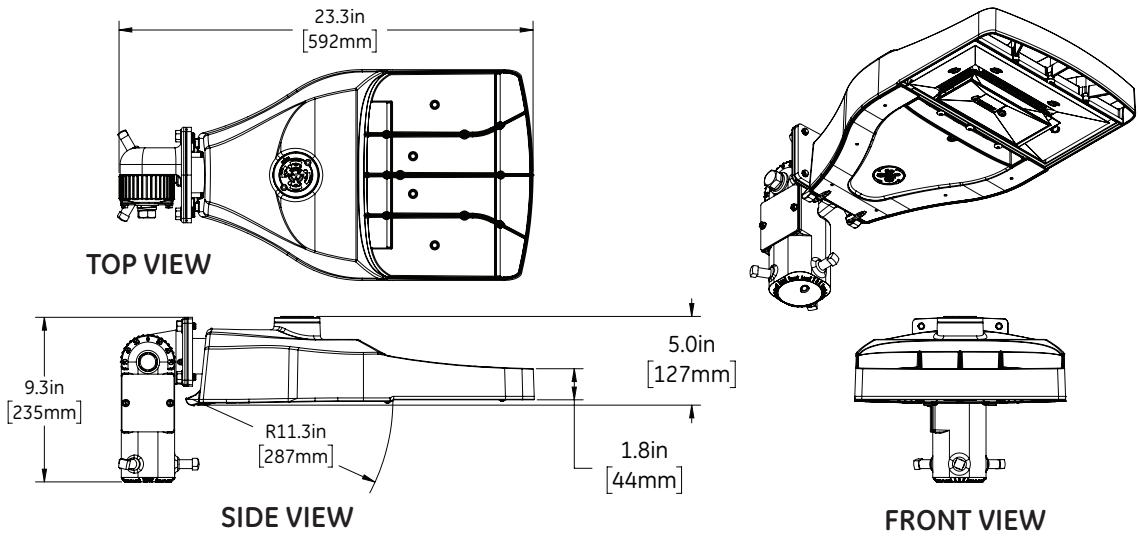
Integral Slipfitter: C1



Knuckle Slipfitter: S1



Knuckle Slipfitter: K1



Product Dimensions

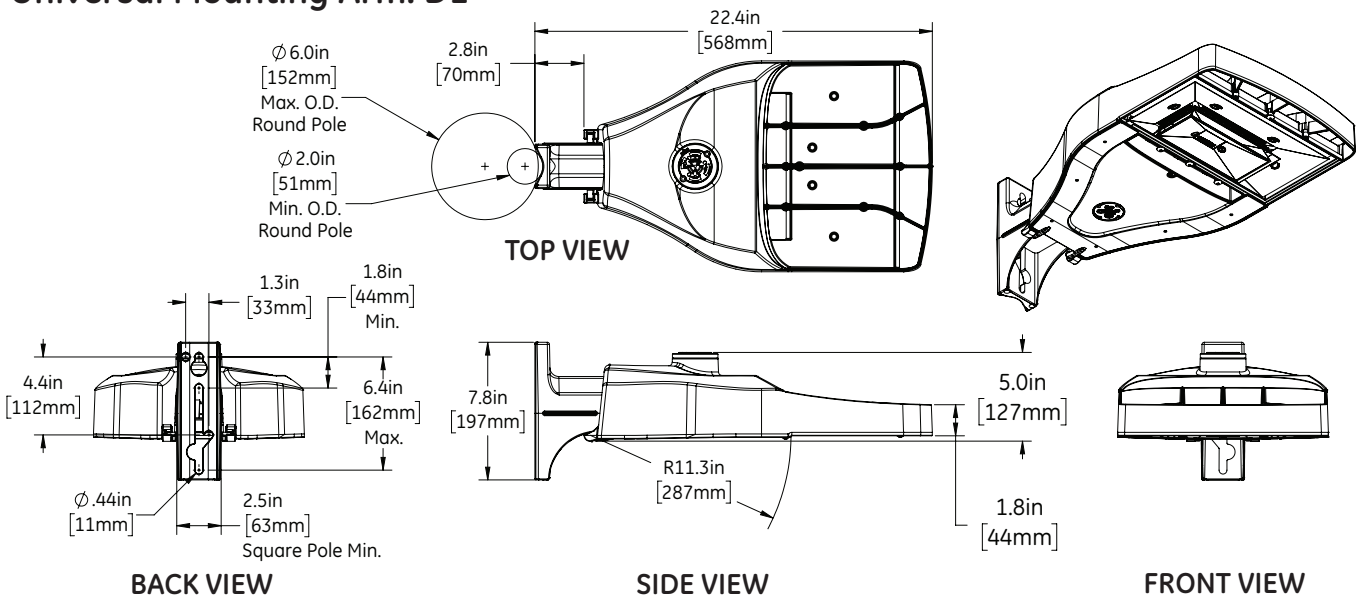
Evolve® Compact Low Wattage Area Light (EACL)

Project name _____

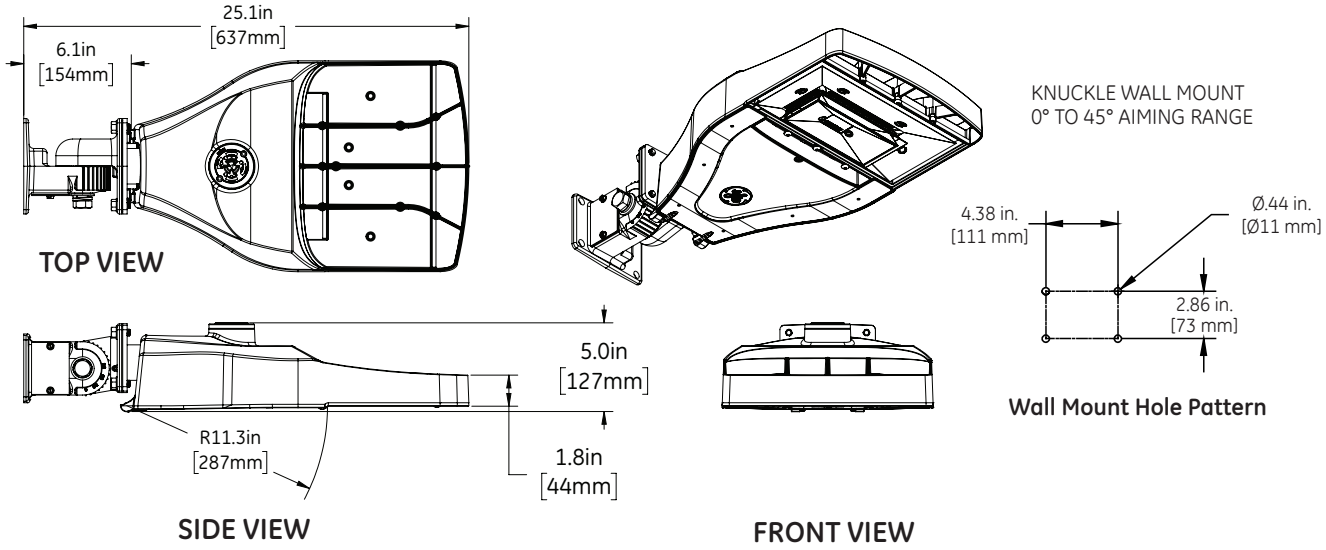
Date _____

Type _____

Universal Mounting Arm: D1



Knuckle Wall Mount: V1



DATA

- Net Weight: 18 lbs (8.16 kg) Max depending on configuration
- Effective Projected Area (EPA):
  - Integral Slipfitter C1, EPA = 0.31 Min/0.37 Max
  - Universal Arm Mount D1, EPA = 0.31 Min / 0.52 Max
  - Knuckle Slipfitter S1, K1 downward aim, EPA = 0.46 Min / 0.56 Max
  - Knuckle Slipfitter S1, K1 45° aim, EPA = 0.56 Min / 1.03 Max

Accessories

Evolve® Compact Low Wattage Area Light (EACL)

Project name _____
Date _____
Type _____

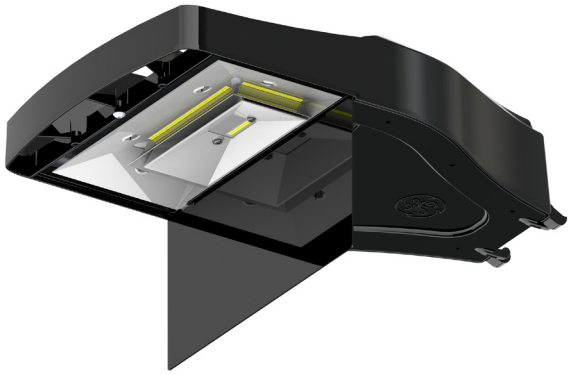
PE Accessories (to be ordered separately)

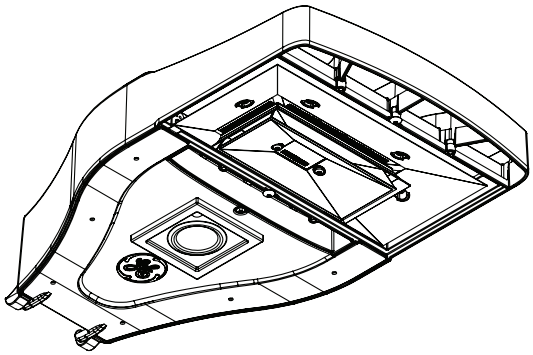
SAP Number	Part Number	Description
93029237	PED-MV-LED-7	ANSI C136.41 Dimming PE, 120-277V
93029238	PED-347-LED-7	ANSI C136.41 Dimming PE, 347V
93029239	PED-480-LED-7	ANSI C136.41 Dimming PE, 480V

SAP Number	Part Number	Description
28299	PEC0TL	STANDARD 120-277V
28294	PEC5TL	STANDARD 480V
80436	PECDTL	STANDARD 347V
73251	SCCL-PECTL	Shorting cap

Back Light Shield

Shield Orientation	Cutoff Distance	Shield Order Logic
Back	Long	ELS-EAC-RBL-BLCK



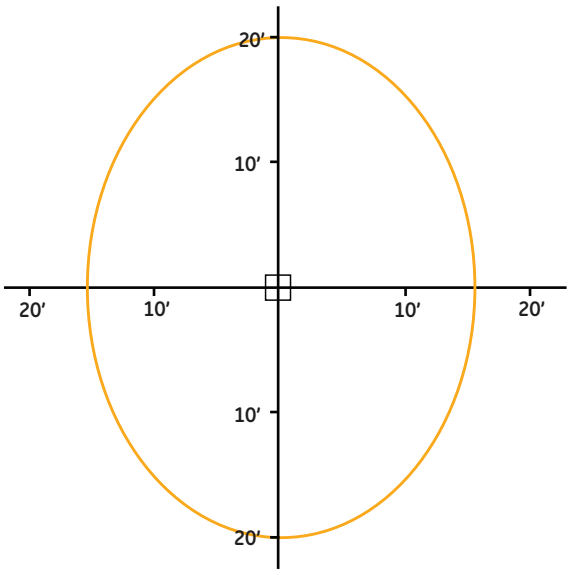


H-Motion Sensing Option

- Intended for applications, between 15-30 ft. mounting height. (4.57-9.14m). For mounting heights exceeding 30 ft., pole mounted sensors are recommended.
- Provides a coverage area radius for walking motion of 15-20 ft. (4.57-6.10m).
- Provides 270° of coverage (~90° is blocked by the pole).
- Standard factory settings:
  - 50% output when unoccupied, 100% output occupied.
  - Integral PE Sensor.
  - 5 minute post-occupancy time delay, 5 minute dimming ramp-down.
- Fixture power increase of 1W expected with sensor use.

Note: Standard options may be reprogrammed in the field. Reprogramming instructions included in product shipment.

Sensor Pattern



Sensing Pattern Area Fixture
Up to 30 ft. Mounting Height

Mounting Information

Evolve® Compact Low Wattage Area Light (EACL)

Project name _____

Date _____

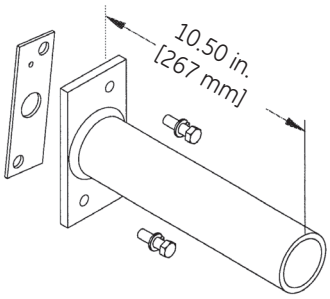
Type _____

Mounting Arms for Slipfitter

Order separately with Mounting Option C1 (Slipfitter)

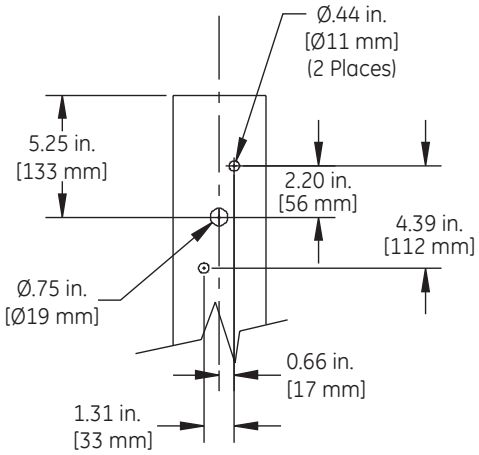
SQUARE POLE MOUNTING ARM

3.5 TO 4.5-inch (89 to 114mm) SQUARE
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



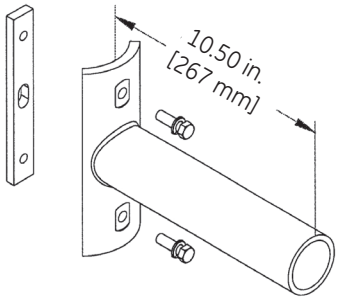
ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
SPA-EAMT10BLCK "Black"
SPA-EAMT10DKBZ "Dark Bronze"
SPA-EAMT10WHTE "White"
SPA-EAMT10GRAY "Gray"

SQUARE POLE MOUNTING DRILLING TEMPLATE



ROUND POLE MOUNTING ARM

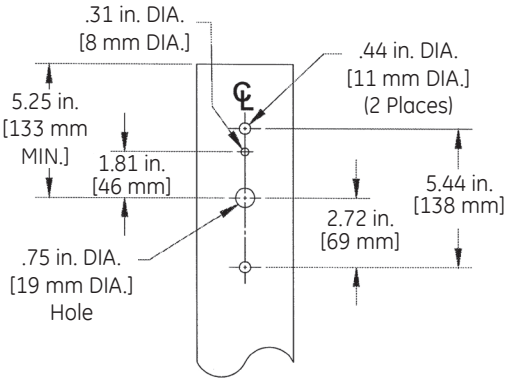
3.5 TO 4.5-inch (89 to 114mm) OD
(WILL ALLOW 4 FIXTURES PER POLE @ 90 DEGREES.)



ORDER SEPARATELY FROM FIXTURE AS CATALOG NUMBER
RPA-EAMT10BLCK "Black"
RPA-EAMT10DKBZ "Dark Bronze"
RPA-EAMT10WHTE "White"
RPA-EAMT10GRAY "Gray"

ROUND POLE MOUNTING DRILLING TEMPLATE

3.5 TO 4.5-inch (89 to 114mm) OD
round pole mounting arm

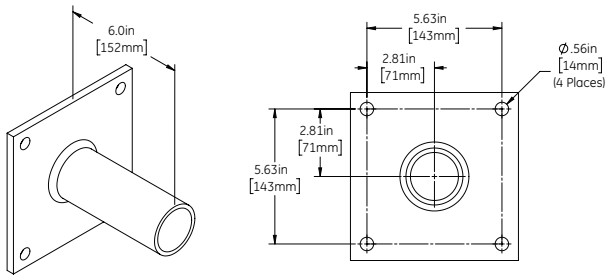


Wall Mounting Bracket Adapter Plate

ORDER SEPERATELY FROM FIXTURE AS CATALOG NUMBER
WMB-EAMT06
NOTE: For Wall Mounting, order luminaire with mounting arm: C1 = Slipfitter 2" Pipe (2.378 in. OD) supplied with leads.

Other mounting patterns are available for retrofit installations. Contact manufacturing for other available mounting patterns.

WALL MOUNTING BRACKET HOLE PATTERN



GE current
a Daintree company

www.gecurrent.com

OLP3157 (Rev 06/22/20)

Streetworks

DESCRIPTION

The Caretaker™ LED area and road luminaire combines high performance, low maintenance and easy installation in a simple, extremely economical package. Designed for years of worry-free operation, the Caretaker luminaire is the perfect area lighting solution for both full-cutoff needs or landmark applications where a highly visible light source is desired. The Caretaker luminaire is also ideal for municipal street lighting retrofits requiring superior optical performance and fast payback on capital.

Catalog #		**Type**
Project		
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

Construction
Single heavy-duty die-cast aluminum housing. Access to stamped aluminum door via a single captive screw (tool-less access option available) for easy maintenance and installation. Corrosion resistant hardware.

Optical
Precision molded optics are designed to shape the distribution, maximize efficiency, and application coverage in each T2, T3 and T5R distributions. Available in six lumen packages at 4000K CCT and minimum 70CRI standard. Optional 3000K / 70CRI, 5000K / 70CRI, and 2700K / 80CRI also available. Fully compatible with SR Acrylic refractor and ANSI/NEMA Standard refractor assembly. For spill light control, an optional house side shield can be installed over the T2 or T3 optic or the drop shield house side shield can be used in conjunction with the T5R or SR options. For zero uplight compliant luminaires, the U0 option provides full cutoff with a spun aluminum shield.

Electrical
LED driver is standard universal voltage and 0-10V dimming with integrated 6kV surge protection. DALI compatible driver available. 10kV or 20kV additional surge protection available. Three position tunnel type compression terminal block standard. Luminaire is designed for efficient thermal management; heat is transferred away from the LEDs for optimal efficiency, light output, and life. Lumen maintenance of 92% at 50,000 hours.

Mounting
Two-bolt slipfitter for mounting on 1-1/4" to 2" standard pipe (1-5/8" to 2-3/8" O.D.). Also available with a bracket for mounting to wood poles, square poles, or walls without a pipe.

Controls
NEMA 3-PIN photocontrol receptacle standard. 7-PIN option available. An integrated dimming and occupancy sensor is a standalone control option available in bi-level dimming (MSP/DIM) operation.

Finish
Unfinished raw aluminum standard. Optional five-stage super TGIC polyester powder coat paint, 2.5-mil nominal thickness for superior protection against fade and wear. Consult your lighting representative at Cooper Lighting Solutions for a complete selection of standard colors. Coastal Construction option available.

Warranty
Standard five-year warranty. Optional ten-year warranty, please see your Cooper Lighting Solutions Streetworks sales representative for more information.

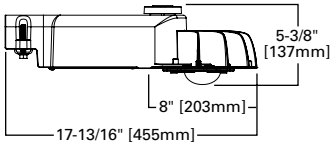
CRTK2
CARETAKER LED

Solid State LED

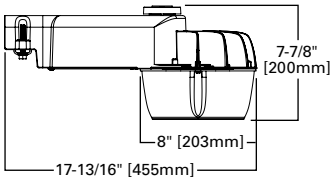
DUSK-TO-DAWN
AREA/ROADWAY LUMINAIRE

DIMENSIONS

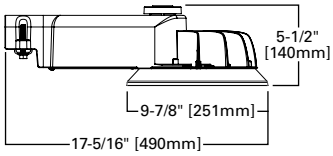
Standard



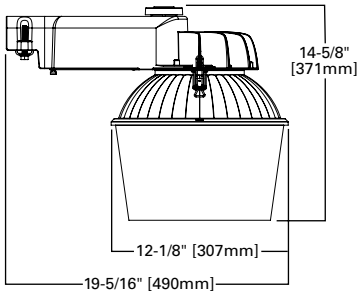
Small arcylic refractor (order separately)



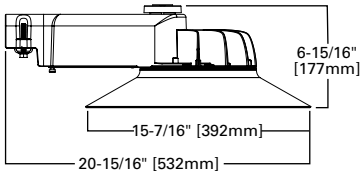
Zero uplight shield (order separately)



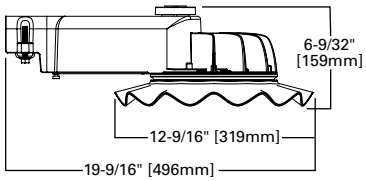
ANSI / NEMA refractor (order separately)



Hillbrook Decorative Shield (order separately)



Fluted Decorative Shield (order separately)



CERTIFICATION DATA
UL/cUL Wet Location Listed
ISO 9001
IP66 Rated (Optic)
3G Vibration Rated
LM79/LM80 Compliant
RoHS Compliant

ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V, 50/60Hz
-40°C Minimum Ambient Temperature Rating
+40°C Maximum Ambient Temperature Rating

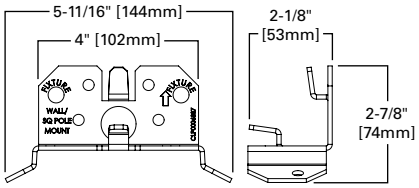
EPA
Effective Projected Area (Sq. Ft.)
Standard: 0.49
Full Cutoff: 0.52
Small Acrylic Refractor: 0.58
ANSI/NEMA Refractor: 1.01

SHIPPING DATA
Approximate Net Weight:
7 - 8 lbs. (3.2 - 3.6 kgs.)

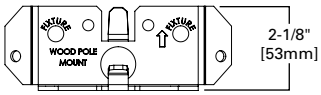
COOPER Lighting Solutions

OPTIONAL WALL/POLE MOUNTING BRACKET

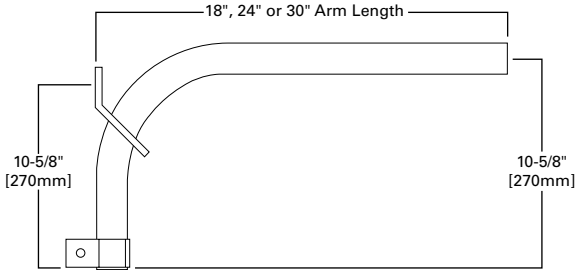
Wall Mount / Square Pole Mount



Pole Mount



OPTIONAL WOOD POLE PIPE ARM



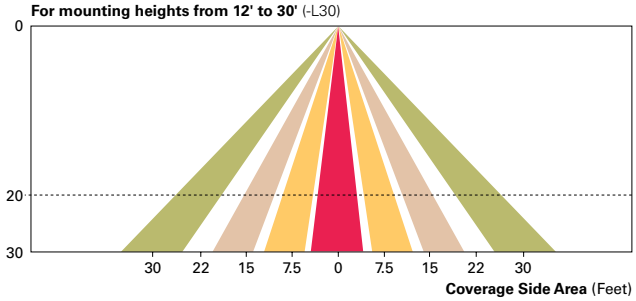
CONTROL OPTIONS

0-10V (D)
This fixture is offered standard with 0-10V dimming driver(s). The dimming option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (4N7)
Photocontrol receptacles provide a flexible solution to enable dusk-to-dawn lighting by sensing light levels. Advanced control systems compatible with NEMA 7-PIN standards can be utilized with the 4N7 receptacle.

Dimming Occupancy Sensor (MSP/DIM-L30)
These sensors are factory installed in the luminaire housing. When the MSP/DIM-L30 sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MSP/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes.

These occupancy sensors includes an integral photocell that can be activated with the ISHH-01 accessory for dusk-to-dawn control or daylight harvesting — the factory preset is OFF. The ISHH-01 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters. A variety of sensor lens are available to optimize the coverage pattern for mounting heights from 12'-30'.



POWER AND LUMENS (UNV)

Light Engine		C013	C015	C016	C018	C01	C01H
Power (Watts)		20	29	41	50	60	71
Wattage Label		20	30	40	50	60	70
Input Current @ 120V (A)		0.17	0.25	0.35	0.42	0.50	0.59
Input Current @ 277V (A)		0.08	0.11	0.16	0.17	0.22	0.26
Optics							
T2	4000K Lumens	2,940	4,247	5,615	6,687	7,996	9,161
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G2	B2-G3-U2	B2-G3-U2	B2-G3-B2
	3000K Lumens	2,862	4,133	5,464	6,507	7,781	8,915
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G2	B2-G3-U2	B2-G3-U2	B2-G3-U2
T2-U0	4000K Lumens	2,940	4,246	5,614	6,685	7,994	9,159
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2
	3000K Lumens	2,861	4,132	5,463	6,506	7,779	8,913
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2
T3	4000K Lumens	2,851	4,118	5,445	6,485	7,554	8,884
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G1	B1-U3-G2	B1-U3-G2	B2-U3-G2
	3000K Lumens	2,775	4,008	5,299	6,311	7,546	8,645
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G1	B1-U3-G1	B1-U3-G2	B2-U3-G2
T3-U0	4000K Lumens	2,854	4,122	5,450	6,490	7,761	8,892
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2
	3000K Lumens	2,777	4,011	5,304	6,316	7,552	8,653
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2
T5R	4000K Lumens	3,103	4,481	5,925	7,056	8,438	9,667
	BUG Rating	B2-U2-G1	B3-U2-G1	B3-U2-G1	B3-U3-G2	B3-U3-G2	B4-U3-G2
	3000K Lumens	3,020	4,361	5,766	6,867	8,211	9,408
	BUG Rating	B2-U2-G1	B3-U2-G1	B3-U2-G1	B3-U2-G1	B3-U3-G2	B3-U3-G2
T5R-U0	4000K Lumens	3,127	4,515	5,971	7,110	8,502	9,741
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B4-U0-G2
	3000K Lumens	3,043	4,394	5,810	6,919	8,274	9,479
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B3-U0-G2
T5R-SR	4000K Lumens	3,071	4,435	5,864	6,983	8,350	9,567
	BUG Rating	B2-U3-G1	B3-U3-G2	B3-U3-G2	B3-U3-G2	B3-U3-G3	B4-U3-G3
	3000K Lumens	2,988	4,316	5,706	6,795	8,126	9,310
	BUG Rating	B2-U3-G1	B3-U3-G2	B3-U3-G2	B3-U3-G2	B3-U3-G2	B4-U3-G3

POWER AND LUMENS (DALI)

Light Engine		C013	C015	C016	C018	C01	C01H
Power (Watts)		23	33	43	53	60	75
Wattage Label		20	30	40	50	60	80
Input Current @ 120V (A)		0.20	0.28	0.36	0.45	0.50	0.63
Input Current @ 277V (A)		0.09	0.13	0.16	0.19	0.22	0.27
Optics							
T2	4000K Lumens	3,341	4,606	5,790	7,325	8,066	9,523
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G2	B2-G3-U2	B2-G3-U2	B2-G3-U2
	3000K Lumens	3,212	4,428	5,564	7,128	7,850	9,267
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G2	B2-G3-U2	B2-U3-G2	B2-G3-U2
T2-U0	4000K Lumens	3,341	4,605	5,788	7,323	8,065	9,521
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2
	3000K Lumens	3,211	4,427	5,564	7,126	7,848	9,265
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2
T3	4000K Lumens	3,240	4,467	5,614	7,103	7,822	9,235
	BUG Rating	B1-U2-G1	B1-U3-G1	B1-U3-G1	B1-U3-G2	B1-U3-G2	B2-U3-G2
	3000K Lumens	3,115	4,294	5,397	6,912	7,612	8,987
	BUG Rating	B1-U2-G1	B1-U2-G1	B1-U3-G1	B1-U3-G2	B1-U3-G2	B2-U3-G2
T3-U0	4000K Lumens	3,243	4,471	5,619	7,109	7,829	9,243
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2
	3000K Lumens	3,118	4,298	5,402	6,918	7,619	8,994
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2
T5R	4000K Lumens	3,526	4,861	6,109	7,730	8,512	10,049
	BUG Rating	B2-U2-G1	B3-U2-G1	B3-U2-G1	B3-U3-G2	B3-U3-G2	B4-U3-G2
	3000K Lumens	3,390	4,673	5,873	7,522	8,283	9,779
	BUG Rating	B2-U2-G1	B3-U2-G1	B3-U2-G1	B3-U3-G2	B3-U3-G2	B4-U3-G2
T5R-U0	4000K Lumens	3,553	4,898	6,156	7,789	8,577	10,126
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B4-U0-G2
	3000K Lumens	3,415	4,708	5,918	7,579	8,347	9,854
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B4-U0-G2
T5R-SR	4000K Lumens	3,489	4,810	6,046	7,649	8,424	9,945
	BUG Rating	B2-U3-G1	B3-U3-G2	B3-U3-G2	B3-U3-G2	B3-U3-G3	B4-U3-G3
	3000K Lumens	3,354	4,624	5,812	7,443	8,197	9,677
	BUG Rating	B2-U3-G1	B3-U3-G2	B3-U3-G2	B3-U3-G2	B3-U3-G3	B4-U3-G3

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (50,000 Hours)	Theoretical L70 (Hours)
Up to 40°C	92.30%	>306,000

ORDERING INFORMATION

Product Family	Light Engine	Driver	Voltage	Distribution
CRTK2=Caretaker	**C013**=1 LED, Approximately 30% Output **C015**=1 LED, Approximately 50% Output **C016**=1 LED, Approximately 60% Output **C018**=1 LED, Approximately 80% Output **C01**=1 LED, Full Output **C01H**=1 LED, High Lumen Output	**D**=Dimming (0-10V) **5LTD**=DALI	**U**=Universal (120-277V)	**T2**=Type II **T3**=Type III **T5R**=Type V Round

Options (Add as Suffix)	**Color**	**Accessories** (Order Separately)
7030=70 CRI / 3000K **7050**=70 CRI / 5000K **8027**=80 CRI / 2700K **SR**=Small Acrylic Refractor (Factory Installed) **TSR**=Tool-less Small Acrylic Refractor (Factory Installed) **U0**=Zero Uplight Shield [1] **TH**=Tool-less Door Hardware **4N7**= NEMA 7-PIN Photocontrol Receptacle **S**=Shorting Cap **MSP/DIM-L30**=Integrated Sensor for Dimming Operation, 12' - 30' Mounting Height [2,3] **10K**=10kV UL 1449 Surge Protection Device **10MSP**=10kV MOV Surge Protection Device **20K**=20kV UL 1449 Surge Protection Device **20MSP**=20kV MOV Surge Protection Device **CC**=Coastal Construction [4] **V**=(3) 5' #14 External Leads **B18**=18" Wood Pole Pipe Arm **B24**=24" Wood Pole Pipe Arm **B30**=30" Wood Pole Pipe Arm **WPBKT**=Wall or Pole Mounting Bracket **5**=120V NEMA Photocontrol Included [8]	**A**=Raw Aluminum **AP**=Grey	**RMARROA5**=ANSI/NEMA Standard Refractor Assembly **SR-CARETAKER**=Small Acrylic Refractor **U0-XX**=Zero Uplight Shield [5] **LLPC**=Long-life Photocontrol **LLPC-FO**=Long-life Photocontrol (Fail Off) **HSS-CRTK2**=Field Install House Side Shield [6] **DS-HSS-CRTK2**=Drop Shield House Side Shield **OA1226**=10kV Surge Module Replacement **OA/RA1013**=Shorting Cap **ISHH-01**=Integrated Sensor Programming Remote [7] **HS-VERD**=Verdeon House Side Shield [6] **VGS-F/B**=Vertical Glare Shield, Front/Back **VGS-SIDE**=Vertical Glare Shield, Side **FS-XX**=Fluted Decorative Shield [5] **HB-XX**=Hillbrook Bell Decorative Shield [5] **TSR-CARETAKER**=Tool-less Small Acrylic Refractor

NOTE:

1. U0 option not offered with SR option.
2. Integrated Sensor not available with 10K or 20K options or 5LTD driver.
3. MSP option in conjunction with C01H or C01 Light Engine only suitable up to 30°C ambient. All other Light Engines only suitable up to 35°C ambient.
4. Anti-corrosion treatment on external components, external screws/mounting bolts, and standard pipe clamp.
5. Replace XX with color.
6. Not for use on T5R optical distribution.
7. This tool enables adjustment to parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Cooper Lighting Solutions for more information.
8. 120V input voltage only required.

HADCO
by signify

Urban

Refractive globe with Lumilock LED engine GX4

RL32/RL52 Post top

Project:

Location:

Cat.No:

Type:

Lamps: Qty:

Notes:

Whether you are looking to beautify or add a sense of security and well-being to your outdoor space, the highly configurable Hadco LED refractive post tops paired with the latest LumiLock light engine GX4 will definitely help you achieve your goals. A multitude of exterior luminaire styles allow you to create promenades and areas exuding timeless, historical charm both day and night. The configurable LED light engine GX4 is an ideal alternative to HID sources, providing you with significant energy savings, and more choices for light levels, optics and controls. Includes Service Tag, the innovative way to provide assistance throughout the life of the product.

Ordering guide

example: RL32 B A A B 1 H W N R5 N A 5 N N N N SP2

Series	Pod	Roof	Cage	Finial	Fastener	Finish	Optic	Pod Photo Control *(location inside of pod)*
RL32 Narrow Body Type 3 **RL52** Narrow Body Type 5	**A** Octagonal style **B** Round fitter with scalloped petals **C** Fluted tapered hourglass **D** Smooth tapered hourglass **G** Tall round fluted **H** Round contemporary **L** Round fluted long **T** Decorative leaf w/scalloped petals	**A** Victorian **B** Acorn **C** Tall **D** Short	**A** Cage for narrow body globe (8 legs) **B** Cage for narrow body globe **E** Band for narrow body globe **F** Band for narrow body globe **H** Cage for narrow body globe (4 legs) **N** None	**A** **B** **C**[1] **D**[1] **E** **F** **G** **H** **N** None	**1** Hex head **2** Allen head	**A** Black **B** White **G** Verde **H** Bronze **J** Green	**S** Short **W** Wide	**E** 120 VAC Button Eye **H** 208/240/277 Button Eye **R**[2,3] 3-Pin Receptacle **N** None

Optional programs

Future Proof Photo Control	Color Temp	Voltage	Drive Current	Integral Control Options	Option 1	Option 2	Option 3	Surge Protection
R5[3,4] 5-pin receptacle on the engine **R7**[3,4] 7-pin receptacle on the engine **N** None	**W** 3000K **N** 4000K	**A** 120-277 VAC **B** 347-480 VAC	**2**[7] 200mA **3** 350mA **4**[7] 450mA **5** 530mA	*Dynadimmer*[5,8] **DA** 4 Hrs 25% Reduction **DB** 4 Hrs 50% Reduction **DC** 4 Hrs 75% Reduction **DD** 6 Hrs 25% Reduction **DE** 6 Hrs 50% Reduction **DF** 6 Hrs 75% Reduction **DG** 8 Hrs 25% Reduction **DH** 8 Hrs 50% Reduction **DJ** 8 Hrs 75% Reduction **DL**[5] DALI **S**[9] FAWS Switch **N** None	**AST**[5] Adjustable start up time **N** None	**CLO**[5] Constant light output **N** None	**OTL**[5] Over the life **N** None	**SP1** 10kV/10kA Surge Protector **SP2**[6] 20kV/20kA Surge Protector

1 Cannot be used with B roof.
2 Twistlock photocell receptacle (R) only available in A, B, G, H, L and T pods.
3 Use of photoelectric cell (pod photo control (R) only) or shorting cap is required to ensure proper illumination. When R, R5, R7 options are selected, product will ship with shorting cap(s) installed.
4 Only available with A or B Clear Roof options. Not available with drive currents 4 or 5.
5 Optional Dynadimer dimming schedules, DALI, AST, CLO, and OTL not available with 347-480 VAC.
6 When SP2 option is selected, luminaire will be fitted with SP2 instead of SP1.
7 Not available with B 347-480 voltage.
8 Not available with R5 or R7.
9 FAWS not available with CLO.

RL32/RL52 Refractive globe with Lumilock LED engine GX4

Post top

LED Wattage and Lumen Values: 4000K

				Short			Wide		
Ordering Code	Total LEDs	LED current (mA)	Average system watts[1] (W)	Delivered lumens[2]	Efficacy (LPW)	BUG rating	Delivered lumens[2]	Efficacy (LPW)	BUG rating
RL32, Acrylic Roof									
RL32xAxxxxxxxNx2xxxxx	64	200	39	5170	131.6	B1-U5-G3	5105	129.9	B1-U5-G3
RL32xAxxxxxxxNx3xxxxx	64	350	69	8729	126.5	B2-U5-G4	8619	124.9	B2-U5-G5
RL32xAxxxxxxxNx4xxxxx	64	450	88	10663	121.7	B2-U5-G4	10529	120.2	B2-U5-G5
RL32xAxxxxxxxNx5xxxxx	64	530	104	12399	118.9	B3-U5-G4	12243	117.4	B2-U5-G5
RL32, Metal Roof									
RL32xDxxxxxxxNx2xxxxx	64	200	39	4383	111.5	B1-U3-G3	4111	104.6	B1-U3-G3
RL32xDxxxxxxxNx3xxxxx	64	350	69	7399	107.2	B2-U4-G3	6940	100.6	B2-U3-G5
RL32xDxxxxxxxNx4xxxxx	64	450	88	9039	103.3	B2-U4-G4	8478	96.9	B2-U4-G5
RL32xDxxxxxxxNx5xxxxx	64	530	104	10510	100.9	B3-U5-G4	9859	94.6	B2-U4-G5
RL52, Acrylic Roof									
RL52xAxxxxxxxNx2xxxxx	64	200	39	5149	132.0	B2-U5-G2	5038	129.2	B2-U5-G3
RL52xAxxxxxxxNx3xxxxx	64	350	69	8653	126.3	B3-U5-G3	8499	124.1	B3-U5-G4
RL52xAxxxxxxxNx4xxxxx	64	450	87	10543	121.3	B3-U5-G3	10524	121.1	B3-U5-G4
RL52xAxxxxxxxNx5xxxxx	64	530	104	12268	118.1	B3-U5-G4	12192	117.3	B3-U5-G5
RL52, Metal Roof									
RL52xDxxxxxxxNx2xxxxx	64	200	39	4339	111.0	B2-U3-G2	4035	103.2	B2-U3-G3
RL52xDxxxxxxxNx3xxxxx	64	350	69	7325	106.8	B3-U4-G3	6811	99.3	B3-U3-G4
RL52xDxxxxxxxNx4xxxxx	64	450	87	8948	102.9	B3-U4-G3	8321	95.6	B3-U3-G4
RL52xDxxxxxxxNx5xxxxx	64	530	104	10405	100.4	B3-U4-G3	9675	93.4	B3-U4-G4

LED Wattage and Lumen Values: 3000K

				Short			Wide		
Ordering Code	Total LEDs	LED current (mA)	Average system watts[1] (W)	Delivered lumens[2]	Efficacy (LPW)	BUG rating	Delivered lumens[2]	Efficacy (LPW)	BUG rating
RL32, Acrylic Roof									
RL32xAxxxxxxxWx2xxxxx	64	200	39	4563	116.1	B1-U4-G3	4505	114.6	B1-U4-G3
RL32xAxxxxxxxWx3xxxxx	64	350	69	7700	111.6	B2-U5-G3	7603	110.2	B2-U5-G4
RL32xAxxxxxxxWx4xxxxx	64	450	88	9411	107.4	B2-U5-G4	9292	106.1	B2-U5-G5
RL32xAxxxxxxxWx5xxxxx	64	530	104	10936	104.9	B2-U5-G4	10798	103.5	B2-U5-G5
RL32, Metal Roof									
RL32xDxxxxxxxWx2xxxxx	64	200	39	3868	98.4	B1-U3-G3	3628	92.3	B1-U3-G3
RL32xDxxxxxxxWx3xxxxx	64	350	69	6527	94.6	B2-U4-G3	6122	88.7	B2-U3-G4
RL32xDxxxxxxxWx4xxxxx	64	450	88	7977	91.1	B2-U4-G4	7483	85.4	B2-U3-G5
RL32xDxxxxxxxWx5xxxxx	64	530	104	9270	88.9	B2-U4-G4	8695	83.4	B2-U4-G5
RL52, Acrylic Roof									
RL52xAxxxxxxxWx2xxxxx	64	200	39	4541	132.0	B2-U4-G2	4444	113.9	B2-U4-G3
RL52xAxxxxxxxWx3xxxxx	64	350	69	7632	126.3	B3-U5-G3	7496	109.4	B3-U5-G3
RL52xAxxxxxxxWx4xxxxx	64	450	87	9299	121.3	B3-U5-G3	9283	106.8	B3-U5-G4
RL52xAxxxxxxxWx5xxxxx	64	530	104	10820	118.1	B3-U5-G3	10753	103.5	B3-U5-G4
RL52, Metal Roof									
RL52xDxxxxxxxWx2xxxxx	64	200	39	3829	97.9	B2-U3-G2	3560	91.0	B2-U3-G3
RL52xDxxxxxxxWx3xxxxx	64	350	69	6462	94.2	B3-U4-G3	6008	87.6	B3-U3-G3
RL52xDxxxxxxxWx4xxxxx	64	450	87	7897	90.8	B3-U4-G3	7343	84.4	B3-U3-G4
RL52xDxxxxxxxWx5xxxxx	64	530	104	9177	88.6	B3-U4-G3	8533	82.4	B3-U4-G4

Due to rapid and continuous advances in LED technology, LED luminaire data is subject to change without notice and at the discretion of Hadco.

Lumen output by optic type will vary slightly. See IES files and specification sheets when available. All technical data is subject to change.

Lumen values based on photometric tests performed in compliance with IESNA LM-79.

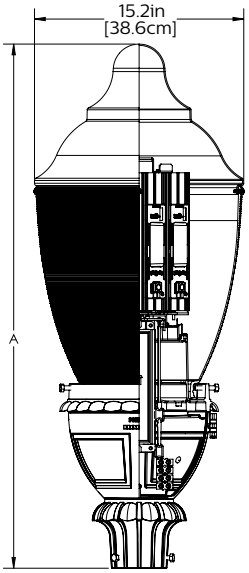
Note: Some data may be scaled based on tests of similar, but not identical, luminaires.

RL32/RL52 Refractive globe with Lumilock LED engine GX4

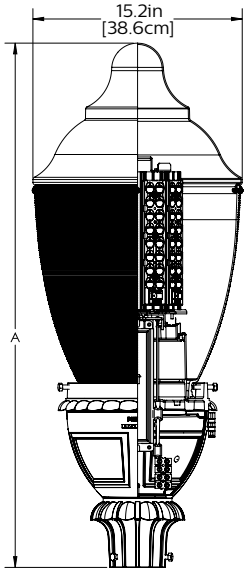
Post top

Dimensions

RL32 - Type 3

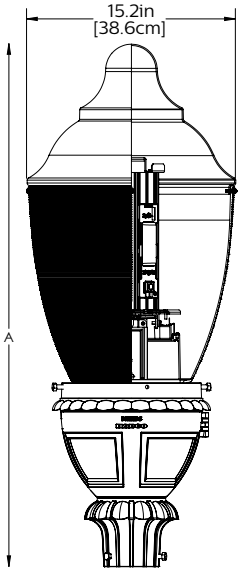


RL32BCNNxxW configuration shown

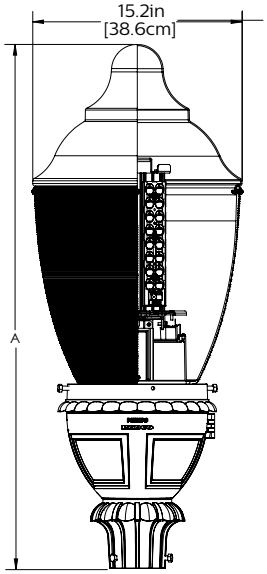


RL32BCNNxxS configuration shown

RL52 - Type 5



RL52BCNNxxW configuration shown



RL52BCNNxxS configuration shown

Roof	Dimension "A"	
	(in)	(cm)
A Victorian	38.0	96.6
B Acorn	35.4	89.8
C Tall	38.0	96.6
D Short	34.1	86.7

EPA: 2.08 sq. ft. (Varies depending on options selected)
Weight: 55lbs (maximum)

Dimensions will vary when other pod, cage and brim options are specified.
See specification text on pages 5 and 6 for option dimensions.

Housing Options

Fitter/Pod Options

A Octagonal

B Round with Scalloped Petals

C Fluted Tapered Hourglass

D Smooth Tapered Hourglass

G Tall Round Fluted

H Round Contemporary

L Round Fluted Long

T Decorative Leaf w/Scalloped Petals

Roof Options

A Victorian

B Acorn

C Tall

D Short

Cage/Band Options

A Cage for Narrow Body Globe

B Cage for Narrow Body Globe

F Band for Narrow Body Globe

E Band for Narrow Body Globe

H Cage for Narrow Body Globe

Finial Options

A **B** **C**

D **E** **F**

G **H**

RL32/RL52 Refractive globe with Lumilock LED engine GX4

Post top

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L_{70} is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L_{70} hours limited to 6 times actual LED test hours.

Driver mA	Optic	Ambient Temperature °C	Calculated L_{70} Hours	L_{70} per TM-21 (Hours)	Lumen Maintenance % at 60,000 hrs
530	Wide	25	>85,000	>60,000 hours	>88%
530	Short	25	>100,000	>54,000 hours	>98%
450	Wide	25	>100,000	>60,000 hours	>93%
450	Short	25	>100,000	>54,000 hours	>98%
350	Wide	25	>100,000	>60,000 hours	>94%
350	Short	25	>100,000	>54,000 hours	>98%
200	Wide	25	>100,000	>60,000 hours	>94%
200	Short	25	>100,000	>54,000 hours	>98%

Field Adjustable Wattage (FAWS) Multiplier Chart

All 350, 450, and 530 mA Configurations

FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage and typical current
1	0.30	0.28
2	0.53	0.48
3	0.62	0.56
4	0.73	0.67
5	0.78	0.73
6	0.83	0.78
7	0.87	0.85
8	0.91	0.89
9	0.95	0.93
10	1.00	1.00

All 200mA Configurations

FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage and typical current
1	0.30	0.35
2	0.50	0.55
3	0.59	0.62
4	0.69	0.72
5	0.77	0.80
6	0.83	0.85
7	0.88	0.90
8	0.93	0.92
9	0.96	0.97
10	1.00	1.00

RL32/RL52 Refractive globe with Lumilock LED engine GX4

Post top

Specifications

Housing

Optional Pods:

A: Octagonal style fitter is constructed of die-cast 360 aluminum alloy with bottom-hinged door providing 135° entry into the fitter assembly for easy access to the electrical components. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal twist-lock photo eye receptacle or optional button eye photocell. Easy access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 10-3/4" and width is 10-1/4".

B: Round fitter with scalloped petals is constructed of die-cast 360 aluminum alloy with side-hinged door providing 180° entry into the fitter assembly for easy access to the electrical components. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal twist-lock photo eye receptacle or optional button eye photocell. Easy access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 12-1/4" and width is 11-1/2".

C: Fluted tapered hourglass fitter is constructed of 356 HM High-Strength, Low-Copper cast aluminum. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal button eye photocell. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 8" and width is 8-3/4".

D: Smooth tapered hourglass fitter is constructed of 356 HM High-Strength, Low-Copper cast aluminum. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal button eye photocell. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 8" and width is 9-1/4".

G: Tall Round fluted fitter is constructed of die-cast 360 aluminum alloy with removable door providing entry into the fitter assembly for easy access to the electrical components. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal button eye photocell. Easy access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 9" and width is 9".

H: Round contemporary fitter is constructed of 356 HM High-Strength, Low-Copper cast aluminum. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal twist-lock photo eye receptacle or optional internal button eye photocell. Easy access to photocell through tool-less door on pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 10" and width is 10".

L: Round fluted long fitter is constructed of 356 HM High- Strength, Low-Copper cast aluminum with a side-hinged door providing entry into the fitter assembly for easy access to the electrical components. Accepts standard Hadco Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal twist-lock photo eye receptacle or button eye photocell. Tool-less access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes three 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering the ballast compartment. Globe is attached using four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). Pod height is 12-1/2" and width is 10-3/4".

T: Decorative Leaf fitter with scalloped petals is constructed of 356 HM High-Strength, Low-Copper cast aluminum with side-hinged door providing 180o entry into the fitter assembly for easy access to the electrical components. Accepts standard HADCO Twistlock ballast assemblies. Wiring block to accept three #8 solid or stranded wires. Optional internal twist-lock photo eye receptacle or optional button eye photocell. Easy access to photo eye through the door on the pod. Heavy cast aluminum post fitter utilizes four 5/16-18 black cadmium stainless steel set screws (Hex head or Allen head as specified) for mounting to 3" O.D. post tenon. Globe holder has an internal water trap to prevent water from entering ballast compartment. Globe is held by utilizing four 5/16-18 black cadmium stainless steel fasteners (Hex head or Allen head as specified). All hardware to be stainless steel and captive. Pod height is 15-1/4" and width is 11-1/2".

Roof

A: Victorian style roof is clear injection molded U.V. stabilized acrylic with 79 horizontal prisms for a soft, even glow. 10-1/4" height and 14-15/16" width. The roof and bottom globe sections are secured in a slip-fit, 1/2" overlap design and use four #10-24 stainless steel pan head screws with four aluminum nutserts providing a mechanical lock and enabling easy future replacement of either the roof or bottom globe section if required.

B: Acorn style roof is clear injection molded U.V. stabilized acrylic with 59 horizontal prisms for a soft, even glow. 7-3/4" height and 15" width. The roof and bottom globe sections are secured in a slip-fit, 1/2" overlap design and use four #10-24 stainless steel pan head screws with four aluminum nutserts providing a mechanical lock and enabling easy future replacement of either the roof or bottom globe section if required.

C: Roof is 0.090" thick spun aluminum. 10" height and 15-3/16" width. The roof and bottom globe sections are secured in a slip-fit, 1/2" overlap design and use four #10-24 stainless steel pan head screws with four aluminum nutserts providing a mechanical lock and enabling easy future replacement of either the roof or bottom globe section if required.

D: Roof is 0.090" thick spun aluminum. 6-1/2" height and 15-3/16" width. The roof and bottom globe sections are secured in a slip-fit, 1/2" overlap design and use four #10-24 stainless steel pan head screws with four aluminum nutserts providing a mechanical lock and enabling easy future replacement of either the roof or bottom globe section if required.

RL32/RL52 Refractive globe with Lumilock LED engine GX4

Post top

Specification (continued)

Cages and Bands

A: Cage for narrow body globes (15" dia.) is constructed of die-cast 360 aluminum alloy. Cage has 4 legs each with round cast aluminum flower block. Open rectangular band around top of cage. Height of cage is 16" and width of cage is 17-1/2". Finish is polyester thermoset powdercoat.

B: Cage for narrow body globes (15" dia.) is constructed of die-cast 360 aluminum alloy. Cage has 4 legs each with square decorative flower block. Solid rectangular band around top of cage. Height of cage is 17" and width of cage is 17". Finish is polyester thermoset powdercoat.

E: Band for narrow body globes (15" dia.) is architectural slotted aluminum. Supported at 4 points by cast aluminum square flower blocks. Finish is polyester thermoset powdercoat.

F: Band for narrow body globes (15" dia.) is architectural slotted aluminum supported at 4 points by cast aluminum round flower blocks. Finish is polyester thermoset powdercoat.

H: Cage for narrow style globes (15" dia.) is constructed of 356 HM High-Strength, Low-Copper cast aluminum. Cage has 4 curved legs. Solid rectangular band around the top of cage. Height of cage is 15" and width of cage is 16-1/2".

Finials

All finials are cast aluminum mounted with 1/4-20 stainless steel threaded studs. Standard finial finish will match fixture finish as specified. Finish is thermoset powdercoat. (NOTE : C, D, and E finials are not available with "B" Roof.)

Fasteners

Used to secure post fitter to post tenon and globe to globe holder.

1: Hex Head Bolts: Black cadmium stainless steel.

2: Allen Head Bolts: Black cadmium stainless steel.

Light engine

GX4 is composed of four main components: Heat Sink, LED, Optical System, and Driver. Electrical components are RoHS compliant.

Entire luminaire is rated for operation in ambient temperature of -40˚C / -40˚F up to +40˚C / +104˚F. B Voltage configurations rated for operation in ambient temperature of -40˚C / -40˚F up to +35˚C / +95˚F.

LED & Optics

Composed of 64 high power LEDs. LED board substrate is MCPCB (Metal Core Printed Circuit Board), designed to minimize thermal resistance from LED junction to heat sinks. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K+/ 275K or 3710K to 4260K) or Warm White, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), CRI 70 Min. 75 Typical.

(W) Wide and (S) Short Optic choices are available. Both optics are made of optical grade PC and have been optimized to achieve maximum spacing, target lumens, and a superior lighting uniformity.

Wide Optics – Superior performance and light level uniformity for applications where typical pole spacing is approximately six times mounting height of luminaire.

Short Optics – Superior performance and light level uniformity for applications where typical pole spacing is approximately five times mounting height of luminaire. Provides higher illumination levels under pole area, ideal for increased security and applications requiring superior facial recognition.

Type 3 and Type 5 distribution choices are available.

LEDs and optics (S) Short or (W) Wide form an IP66 light engine to ensure complete environmental protection against water and dust ingress and corrosion, critical to long term LED reliability. All wiring is full copper, with 105C rated insulation. LED modules are secured to heatsinks using #8 stainless steel hardware, guaranteeing construction rigidity and vibration resistance.

Heat sinks

LED Engine construction consists of four 6063-T5 aluminum heat sinks, clear anodized to MIL-A-8625 specifications for excellent corrosion resistance and surface finish. Fin spacing has been optimized for maximum convective heat transfer under natural convection conditions, maximizing LED life and efficiency. Heat sinks provide greater than 700 sq. in. of convective surface area total, ensuring proper junction temperature control, lumen maintenance, and system reliability. Extruded heatsinks meet or exceed tolerances as specified by AEC (Aluminum Extruders Council) standards and have been designed to provide superior surface flatness, ensuring excellent contact between heatsinks and LEDs. Product does not use any cooling device with moving parts (passive cooling only).

Heat sinks are secured using galvanized steel brackets and stainless steel hardware to provide additional corrosion resistance.

Globe Assembly

Narrow globe is constructed of clear injection molded U.V. stabilized acrylic. A two-piece (Globe and Roof) slip-fit, 1/2" overlap, design utilizes nutserts and stainless steel fasteners, which eliminates a seam appearance.

The optical section of the globe has a neck opening of 7-3/8" and an outside neck diameter of 8". Globe (less the roof) has a 15-1/2" height and 15" width at the top with 114 horizontal prisms and 360 highly polished vertical prisms.

Driver

Driver comes standard with 0-10V dimming capability. High power factor of 95%. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max. Driver operating ambient temperature range is -40F (-40C) to +130F (+55C). Certified in compliance to UL1310 cULus requirement (dry and damp location). Assembled on a LumiLock twistlock removable cover with Tyco quick disconnect plug resisting to 221˚F (105˚C). The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

Driver Options

AST: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

OTL: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

Dimming Options

DA: 4 Hrs 25% Reduction
DB: 4 Hrs 50% Reduction
DC: 4 Hrs 75% Reduction
DD: 6 Hrs 25% Reduction
DE: 6 Hrs 50% Reduction
DF: 6 Hrs 75% Reduction
DG: 8 Hrs 25% Reduction
DH: 8 Hrs 50% Reduction
DJ: 8 Hrs 75% Reduction
DALI: Pre-set driver compatible with DALI logarithmic control system.

FAWS

Field Adjustable Wattage Selector, pre set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details.

Note: It is not recommended to use FAWS with other dimming or controls; if you do, set the switch to position 10 (maximum output) to enable the other dimming or controls. Switching FAWS to any position other than 10 will disable the other dimming or controls.

RL32/RL52 Refractive globe with Lumilock LED engine GX4

Post top

Specification (continued)

Scenarios	Pod Photo Control Options	Future Proof Photo Control Options
Scenario 1: Basic Level of Controls only	Choose E, H or R options	Choose None
Scenario 2 – Network Control Solutions are being used immediately on this project	Choose None	Choose R5 or R7 (will ship with a shorting cap for you to remove and replace with your node)
Scenario 3 – You would like the product to be future proof because one day you will use a networked lighting controls system. You also require the use of a basic photo control system now to turn your lights on and off	Choose E, H or R depending on your requirements	Choose R5 or R7 (will ship with a shorting cap for you to remove and replace with your node, then move the shorting cap to the pod receptacle). If you used a button eye, disconnect the button eye.

Future Proof Photo Control Options

R5 – Receptacle with 5 pins enabling dimming. Can be used with a twist lock node or a shorting cap. Will ship with a shorting cap installed for this product. Remove shorting cap when you are ready to install your node.

R7 – Receptacle with 7 pins enabling dimming and additional functionality (to be determined). Can be used with a twist lock node or a shorting cap. Will ship with a shorting cap installed for this product. Remove shorting cap when you are ready to install your node.

Surge Protection

Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA. Option for SP2 20kV/20kA.

Finish

Color in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with ± 1 mils / 24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard. The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, using LM-80 data from LED manufacturers and engineering prediction methods, the luminaire useful life is expected to reach 100,000+ hours with >L70 lumen maintenance @ 25˚C. 530mA configurations with short optics expected to reach 95,000+ hours with >L70 lumen maintenance @ 25C. 530mA configurations with wide optics expected to reach >75,000 hours with >L70 lumen maintenance @ 25C. Luminaire useful life accounts for LED lumen maintenance and additional factors, including LED life, driver life, PCB substrate, solder joints on/off cycles and burning hours for nominal applications. Lifetime statements do not include the use of controls, including networked controllers.

LED products manufacturing standard

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340 5 1 and ANSI/ ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Quality Control

The manufacturer must provide a written confirmation of its ISO 9001 2008 and ISO 14001 2004 International Quality Standards Certification.

Vibration Resistance

Meets the ANSI C136.31 2001, American National Standard for Roadway Luminaire Vibration specifications for Normal Applications.

Service Tag

Each individual luminaire is uniquely identifiable, thanks to the Service tag application. With a simple scan of a QR code, placed inside the luminaire, you gain instant access to the luminaire configuration, making installation and maintenance operations faster and easier, no matter what stage of the luminaire's lifetime.
Just download the APP and register your product right away.

For more details visit: **philips.com/servicetag**

Certifications and Compliance

cETL listed to Canadian safety standards for wet locations. Manufactured to ISO 9001:2008 Standards. UL8750 and UL1598 compliant. ETL listed to U.S. safety standards for wet locations. LM80 & LM79 tested. IP Rating: IP66 sealed light engine. The LED driver is IP66 rated. LED luminaires are Design Lights Consortium qualified.

Warranty

5 year extended warranty.

See **philips.com/warranties** for details and restrictions.

Signify North America Corporation
200 Franklin Square Drive,
Somerset, NJ 08873
Telephone 855-486-2216

Signify Canada Ltd.
281 Hillmount Road,
Markham, ON, Canada L6C 2S3
Telephone 800-668-9008

HADCO
by signify

Urban

New London

VX8911 Post top

Project:

Location:

Cat.No:

Type:

Lamps: Qty:

Notes:

The Hadco New London LED post top has an elegance that accentuates the majesty and style of many urban architectural designs. It offers the style of traditional lanterns with today's cutting edge LEDgine technology. The optional cast aluminum spikes provide additional detailing to create the look you need.

Ordering guide

Example: VX8911-48-A-C-2-N-W-A-3-N-N-N-N-SP1-S-N

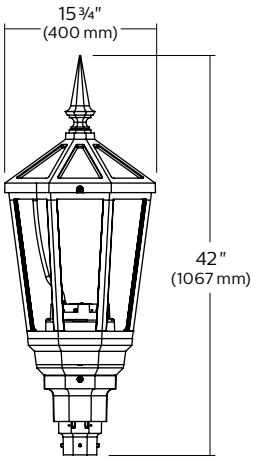
Series	LED count	Gen	Finish	Panels	Optics	Photo Control	Color Temp	Voltage	Drive Current	Integral Controls[2]	Options #1[2]	Options #2[2]	Options #3[2]	Surge Protect	Spikes	House Side Shield
VX8911	**32**[1,3] 32 LEDs **48** 48 LEDs **64** 64 LEDs	**G2** Gen 2	**A** Black **B** White **G** Verde **H** Bronze **J** Green	**C** Clear **F** Frosted	**2** Type 2 **3** Type 3 **3W** Type 3 Wide **4** Type 4 **5** Type 5	**E** 120 VAC button eye **H** 208/240/277 VAC button eye **R** 3-Pin Twist Lock Receptacle **N** None	**N** Neutral 4000K **W** Warm 3000K	**A** 120-277 **B**[2,3] 347-480	**3** 350mA **5** 530mA **7**[1] 700mA	Dynadimmer **DA** 4 Hrs, 25% reduction **DB** 4 Hrs, 50% reduction **DC** 4 Hrs, 75% reduction **DD** 6 Hrs, 25% reduction **DE** 6 Hrs, 50% reduction **DF** 6 Hrs, 75% reduction **DG** 8 Hrs, 25% reduction **DH** 8 Hrs, 50% reduction **DJ** 8 Hrs, 75% reduction **DL** DALI **N** None	**AST** Adjustable Start Up Time **N** None	**CLO** Constant Light Output **N** None	**OTL** Over The Life **N** None	**SP1** 10kV/10kA Surge Protector **SP2** 20kV/20kA Surge Protector	**S** Spikes **N** None	**H** House Side Shield **N** None

1. The 700mA (7) current is only compatible for 32 LEDs (32) configurations.
2. Configurations with 347-480VAC (B) voltage are not compatible with optional dimming or optional programming.
3. Configurations with 32 LEDs (32) at 350mA (3) and 530mA (5) currents are not compatible with 347-480 VAC (B) voltage.

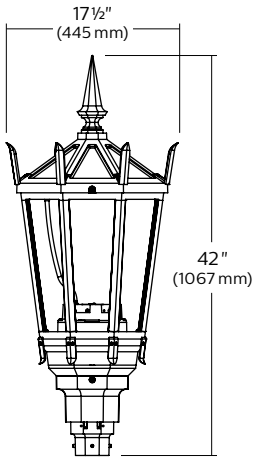
VX8911 New London

Post top

Dimensions



VX8911
Height: Without Spikes 42" (107cm)
Width: Without Spikes 15 3/4" (40cm)
Max. EPA: 2.7 sq. ft.
Max. Weight 38.5 lbs.



VX8911
Height: With Spikes 42" (107cm)
Width: With Spikes 17 1/2" (44.5cm)
Max. EPA: 2.7 sq. ft.
Max. Weight 38.5 lbs.

LED Wattage and Lumen Values for 3000K fixtures

Ordering Code: (3000K)	Total LEDs	System current (mA)	Average System Watts[1] (W)	Type 2			Type 3			Type 3W			Type 4			Type 5		
				Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating
Clear Panel VX8911 3000K																		
32-G2-C-x-W3	32	350	38	2499	65.8	B1-U2-G1	2450	64.5	B1-U2-G1	2583	68.0	B1-U2-G1	2495	65.7	B1-U2-G1	2665	70.1	B2-U2-G1
32-G2-C-x-W5	32	530	53	3585	67.6	B1-U2-G1	3514	66.3	B1-U2-G1	3705	69.9	B1-U2-G1	3579	67.5	B1-U2-G1	3823	72.1	B3-U2-G1
32-G2-C-x-W7	32	700	71	4521	63.7	B1-U2-G1	4432	62.4	B1-U2-G1	4673	65.8	B1-U2-G1	4514	63.6	B1-U2-G1	4821	67.9	B3-U2-G1
48-G2-C-x-W3	48	350	51	3749	73.5	B1-U2-G1	3675	72.1	B1-U2-G1	3875	76.0	B1-U2-G1	3743	73.4	B1-U2-G1	3998	78.4	B3-U2-G1
48-G2-C-x-W5	48	530	79	5377	68.1	B1-U3-G1	5271	66.7	B1-U3-G1	5557	70.3	B1-U2-G2	5368	67.9	B1-U2-G1	5734	72.6	B3-U2-G1
64-G2-C-x-W3	64	350	68	4931	72.5	B1-U3-G1	4942	72.7	B1-U2-G1	5027	73.9	B1-U2-G1	4927	72.5	B1-U2-G1	5137	75.5	B3-U2-G1
64-G2-C-x-W5	64	530	103	7073	68.9	B1-U3-G1	7088	69.1	B1-U3-G2	7210	70.2	B2-U3-G2	7067	68.8	B1-U3-G2	7368	71.8	B3-U3-G2
Frosted Panel VX8911 3000K																		
32-G2-F-x-W3	32	350	38	2191	57.7	B1-U3-G2	2165	57.0	B1-U3-G2	2296	60.4	B1-U3-G2	2216	58.3	B1-U3-G2	2371	62.4	B1-U3-G2
32-G2-F-x-W5	32	530	53	3143	59.3	B1-U3-G2	3105	58.6	B1-U3-G2	3293	62.1	B1-U3-G3	3179	60.0	B1-U3-G3	3401	64.2	B2-U3-G2
32-G2-F-x-W7	32	700	71	3964	55.8	B1-U3-G3	3917	55.2	B1-U3-G3	4154	58.5	B1-U3-G3	4009	56.5	B1-U3-G3	4289	60.4	B2-U3-G3
48-G2-F-x-W3	48	350	51	3287	64.5	B1-U3-G2	3248	63.7	B1-U3-G2	3444	67.5	B1-U3-G3	3324	65.2	B1-U3-G3	3557	69.7	B2-U3-G2
48-G2-F-x-W5	48	530	79	4714	59.7	B1-U3-G3	4658	59.0	B1-U3-G3	4940	62.5	B1-U3-G3	4768	60.4	B1-U3-G3	5101	64.6	B2-U3-G3
64-G2-F-x-W3	64	350	68	4392	64.6	B1-U3-G3	4343	63.9	B1-U3-G3	4501	66.2	B1-U3-G3	4401	64.7	B1-U3-G3	4687	68.9	B2-U3-G3
64-G2-F-x-W5	64	530	103	6300	61.4	B2-U3-G3	6230	60.7	B2-U3-G3	6456	62.9	B2-U3-G3	6312	61.5	B1-U3-G3	6723	65.5	B3-U3-G3

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at outdoorlighting.applications@philips.com.

Note: Some data may be scaled based on tests of similar. But not identical luminaires.

VX8911 New London

Post top

LED Wattage and Lumen Values for 4000K fixtures

Ordering Code: (4000K)	Total LEDs	System current (mA)	Average System Watts[1] (W)	Type 2			Type 3			Type 3W			Type 4			Type 5		
				Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating	Lumen Output[2]	Efficacy (LPW)	BUG Rating
Clear Panel VX8911 4000K																		
32-G2-C-x-N3	32	350	38	2836	74.6	B1-U2-G1	2781	73.2	B1-U2-G1	2932	77.2	B1-U2-G1	2832	74.5	B1-U2-G1	3025	79.6	B2-U2-G1
32-G2-C-x-N5	32	530	53	4068	76.8	B1-U2-G1	3988	75.2	B1-U2-G1	4205	79.3	B1-U2-G1	4062	76.6	B1-U2-G1	4338	81.8	B3-U2-G1
32-G2-C-x-N7	32	700	71	5131	72.3	B1-U3-G1	5030	70.8	B1-U3-G1	5303	74.7	B1-U2-G2	5123	72.2	B1-U2-G1	5472	77.1	B3-U3-G1
48-G2-C-x-N3	48	350	51	4254	83.4	B1-U2-G1	4171	81.8	B1-U2-G1	4397	86.2	B1-U2-G1	4247	83.3	B1-U2-G1	4537	89.0	B3-U2-G1
48-G2-C-x-N5	48	530	79	6102	77.2	B1-U3-G1	5983	75.7	B1-U3-G1	6307	79.8	B1-U2-G2	6092	77.1	B1-U3-G2	6508	82.4	B3-U2-G2
64-G2-C-x-N3	64	350	68	5596	82.3	B1-U3-G1	5608	82.5	B1-U3-G1	5705	83.9	B1-U2-G2	5592	82.2	B1-U3-G1	5830	85.7	B3-U2-G1
64-G2-C-x-N5	64	530	103	8027	78.2	B2-U3-G2	8044	78.4	B2-U3-G2	8183	79.7	B2-U3-G2	8021	78.1	B2-U3-G2	8362	81.5	B3-U3-G2
Frosted Panel VX8911 4000K																		
32-G2-F-x-N3	32	350	38	2487	65.4	B1-U3-G2	2457	64.7	B1-U3-G2	2606	68.6	B1-U3-G2	2515	66.2	B1-U3-G2	2691	70.8	B1-U3-G2
32-G2-F-x-N5	32	530	53	3567	67.3	B1-U3-G2	3524	66.5	B1-U3-G2	3738	70.5	B1-U3-G3	3607	68.1	B1-U3-G3	3860	72.8	B2-U3-G2
32-G2-F-x-N7	32	700	71	4498	63.4	B1-U3-G3	4445	62.6	B1-U3-G3	4714	66.4	B2-U3-G3	4550	64.1	B1-U3-G3	4868	68.6	B2-U3-G3
48-G2-F-x-N3	48	350	51	3730	73.1	B1-U3-G2	3686	72.3	B1-U3-G3	3909	76.6	B1-U3-G3	3772	74.0	B1-U3-G3	4036	79.1	B2-U3-G3
48-G2-F-x-N5	48	530	79	5350	67.7	B1-U3-G3	5287	66.9	B1-U3-G3	5607	71.0	B1-U3-G3	5411	68.5	B1-U3-G3	5790	73.3	B2-U3-G3
64-G2-F-x-N3	64	350	68	4985	73.3	B1-U3-G3	4929	72.5	B1-U3-G3	5108	75.1	B1-U3-G3	4994	73.4	B1-U3-G3	5319	78.2	B2-U3-G3
64-G2-F-x-N5	64	530	103	7150	69.7	B2-U3-G3	7071	68.9	B2-U3-G3	7327	71.4	B2-U3-G4	7164	69.8	B2-U3-G3	7630	74.3	B3-U3-G3

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at outdoorlighting.applications@philips.com.

Note: Some data may be scaled based on tests of similar. But not identical luminaires.

Specifications

Housing

Roof: Hinged roof with stainless steel thumb screw. 356HM low-copper cast.

Panels: Two panel options. Clear panels are made of an U.V Stabilized sheet material. Frosted Panels are U.V. Stabilized sheet material. All panels are attached with a clip and can easily be removed for cleaning.

Fitter: Slip Fitter Dimensions: 3" I.D. x 3" deep. Hinged door to access photocontrol components.

Light Engine

LEDgine is composed of five main components: Heat Sink, Lens, LED lamp, Optical System, and Driver. Electrical components are RoHS compliant.

LED Module

Composed of high-performance white LEDs. Color temperature as per ANSI/NEMA bin - Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K) or Warm White, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), CRI 70 Min. 75 Typical.

Heat Sink

Made of cast aluminum optimizing the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Optical System

Type 2, 3, 3W, 4 and Type 5 composed of high performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM 63, LM 79 and TM 15 (IESNA) certifying its photometric performance. Street side indicated.

Driver

Driver comes standard with 0-10V dimming capability. High power factor of 95%. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max. Maximum ambient operating temperature from 40˚F (4˚C) to 130˚F (55˚C). Certified in compliance to UL1310 cULus requirement (dry and damp location). Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221˚F (105˚C). The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

VX8911 New London

Post top

Specifications (continued)

Driver Options

AST: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

OTL: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

Dimming Options

DA: 4 Hrs 25% reduction
DB: 4 Hrs 50% reduction
DC: 4 Hrs 75% reduction
DD: 6 Hrs 25% reduction
DE: 6 Hrs 50% reduction
DF: 6 Hrs 75% reduction
DG: 8 Hrs 25% reduction
DH: 8 Hrs 50% reduction
DJ: 8 Hrs 75% reduction

Surge Protection

Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA. Option for SP2 20kV/20kA.

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, using LM-80 data from LED manufacturers and engineering prediction methods, the luminaire useful life is expected to reach 100,000+ hours with >L70 lumen maintenance @ 25°C (48 LED and 64LED at 530mA is 68,000). Luminaire useful life accounts for LED lumen maintenance and additional factors, including LED life, driver life, PCB substrate, solder joints on/off cycles and burning hours for nominal applications.

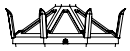
Hardware

All non-ferrous fasteners prevent corrosion and ensure longer life.

Wiring

18 AWG wire, 6" (152mm) minimum exceeding from luminaire.

Options



S
Spikes

HS
House side shield

SP2
20kV/20kA integral surge protector (optional)

Finish

Color in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with ± 1 mils / 24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard. The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

LED products manufacturing standard

electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340 5 1 and ANSI/ ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Quality Control

The manufacturer must provide a written confirmation of its ISO 9001 2008 and ISO 14001 2004 International Quality Standards Certification.

Meets the ANSI C136.31 2010, American national Standard for Roadway Luminaire Vibration specifications for Normal Applications.

Certifications and Compliance

cETL listed to Canadian safety standards for wet locations. Manufactured to ISO 9001:2008 Standards. UL8750 and UL1598 compliant. ETL listed to U.S. safety standards for wet locations. cETL listed to Canadian safety standards for wet locations. LM80 & LM79 tested. Listed on the DesignLightsTM Consortium (DLC) Qualified Products List (QPL).

IP Rating

The LED optics chamber is IP66 rated.

Warranty

5 year extended warranty.

LED Performance

Predicted lumen depreciation data[1]				
Ambient Temperature (°C)	Driver mA	Calculated L_{70} hours[1,2]	L_{70} per TM-21[2,3]	Lumen Maintenance % @ 60,000 hours
25°C	up to 700 mA	>100,000	>60,000	90%

1. Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.
2. L_{70} is the predicted time when LED performance depreciates to 70% of initial lumen output.
3. Calculated per IESNA TM21-11. Published L_{70} hours limited to 6 times actual LED test hours.

Signify North America Corporation
200 Franklin Square Drive,
Somerset, NJ 08873
Telephone 855-486-2216

Signify Canada Ltd.
281 Hillmount Road,
Markham, ON, Canada L6C 2S3
Telephone 800-668-9008

LED OUTDOOR LIGHTING CONVERSION PROJECT

LKE, in cooperation with Louisville Metro Government and Lexington-Fayette Urban County Government, conducted an outdoor lighting project to convert HID fixtures to LED. The goal is to understand the true cost of a proactive LED conversion in order to compare against the current maintenance replacement plan, in which existing HID fixtures are replaced only when they fail. A total of 1,347 LED fixtures have replaced existing HID streetlights in LG&E and KU as part of this project.

LG&E enlisted input from Louisville Metro to identify target areas. The project targets areas considered to be hot zones for recurring criminal activity and where the city is pursuing economic investment. Metro believes better lighting will enhance safety in these areas helping bring in new investments. A total of 666 LED fixtures have been installed along roadways at 18th & Broadway, 26th & Broadway, Goss Avenue, Shelby Street, Beechmont, Brownsboro Road, Taylor & Berry, West Market and the Baxter & Bardstown corridors.

KU suggested 6 potential target areas in Fayette County to the LFUCG Public Works department. LFUCG ultimately agreed to allow KU to pursue this conversion project in two of those areas. 681 LEDs have replaced the HID streetlights in the Elm Tree neighborhood and along Man 'O War Boulevard between Versailles Road and Clays Mill Road.

The targeted areas consist of major thoroughfares, urban corridors, and residential neighborhoods. They also include a mix of fixtures types on both wood distribution poles and decorative non-wood poles. This make-up simulated a proactive conversion using a variety of work settings and materials, which allows the companies to better understand the cost of a proactive systematic conversion when deployed system wide.

Today, LKE replaces HID fixtures upon failure with a comparable LED fixture on a one-off basis. In LG&E and Lexington this work is performed by line technician business partners on a per unit basis using a one-man crew with a bucket truck. The proactive conversion project utilizes a two man-crew, one bucket truck and a pickup truck to carry materials and aid in traffic control. For major thoroughfares, an arrow board is required for traffic control, and in some situations a full traffic control unit. In KU, the labor cost per light for a proactive conversion was $102.20 compared to the average contractor unit cost per light of $92.10 for a failed fixture replacement ($10.10 increase per light). In LG&E, the labor cost per light for a proactive conversion was $112.36 compared to the to the average contractor unit cost per light of $94.33 for a failed fixture replacement ($18.03 increase per light).

On average, LG&E's contractor was able to replace one fixture every 40 minutes during the project while KU's contractor was able to replace one fixture every 33 minutes. LKE believes it has secured LED fixtures for the lowest cost possible even considering potential bulk orders to support a system-wide conversion. Therefore, for LKE the primary cost savings opportunity in a proactive conversion is labor costs. Strictly speaking from a labor cost perspective, it appears that the difference between the current maintenance-based conversion and a proactive conversion strategy is negligible.

The below lessons learned, and labor costs snapshot provides an understanding of what improvements need to be made operationally and what costs could be incurred for proactive conversions using actual labor costs per light versus labor unit costs. LKE can use these results to effectively negotiate unit rates for proactive conversion (for example, if a customer request conversion of 5 or more adjacent lights), however, that unit will likely be in line with existing unit rates for LKE's lighting contractors.

LKE is continuing to explore potential efficiencies that can be gained through a proactive conversion of LEDs and is in the beginning stages of planning a second phase of this proactive conversion project for early 2021. LKE will continue to evaluate the benefits of a proactive conversion against the current strategy of a maintenance-based conversion (e.g. less maintenance on LEDs and energy savings).

LABOR COSTS

KU

			Proactive Conversion				Maintence Conversion Comparison		
Area	Fixture Type	# of Fixtures Replaced	Total Hours	Mins. Per Fixture	Total Labor Cost	Labor Cost Per Light	Unit Rate Per Light	Total Labor Unit Cost	Labor Variance
Elm Tree	Cobra	283	147	31	$29,130.72	$102.94	$116.00	$32,828.00	
	Contemporary	103	72	42	$10,602.35	$102.94	$75.00	$7,725.00	
	Open Bottom	1	1	53	$102.94	$102.94	$116.00	$116.00	
Total		**387**	**220**	**34**	**$39,836.00**	**$102.94**		**$40,669.00**	**-$833.00**
Man 'O War	Cobra	294	156	32	$29,760.00	$101.22	$75.00	**$22,050.00**	**$7,710.00**
KU Totals		**681**	**376**	**33**	**$69,596.00**	**$102.20**	**$92.10**	**$62,719.00**	**$6,877.00**

LG&E

			Proactive Conversion				Maintence Conversion Comparison		
Area	Fixture Type	# of Fixtures Replaced	Total Hours	Mins. Per Fixture	Total Labor Cost	Labor Cost Per Light	Unit Rate Per Light	Total Labor Unit Cost	Labor Variance
18th & Broadway	Cobra (OH)	39					$97.36	$3,797.04	
	Cobra (UG)	13					$71.74	$932.62	
Total		**52**	**36**	**42**	**$5,816.52**	$111.86		**$4,729.66**	**$1,086.86**
Shelby Street	Cobra (OH)	132	85	39			97.36	$12,851.52	
	Flood	3	2	39			97.36	$292.08	
Total		**135**	**86**	**38**	**$14,138.32**	$104.73		**$13,143.60**	**$994.72**
Goss Avenue	Cobra (OH)	52					97.36	$5,062.72	
	Cobra (UG)	1					71.74	$71.74	
Total		**53**	**31**	**35**	**$5,010.65**	$94.54		**$5,134.46**	**-$123.81**
26th & Broadway	Cobra (OH)	**29**	**18**	**37**	**$3,823.56**	$131.85	97.36	**$2,823.44**	**$1,000.12**
Beechmont	Cobra (OH)	60	40	40	$6,867.77	$114.46	97.36	$5,841.60	
	Colonial	17	8	28	$1,943.20	$114.31	58.73	$998.41	
	Acorn	14	8	34	$971.60	$69.40	58.73	$822.22	
	Contemporary	18	12	40	$1,938.84	$107.71	71.74	$1,291.32	
Total		**109**	**68**	**37**	**$11,721.41**	$107.54		**$8,953.55**	**$2,767.86**
Brownsboro Road	Cobra (OH)	**43**	**29**	**40**	**$5,172.33**	$120.29	97.36	**$4,186.48**	**$985.85**
Taylor & Berry	Cobra (OH)	**101**	**64**	**38**	**$10,110.48**	$100.10	97.36	**$9,833.36**	**$277.12**
West Market	Cobra (OH)	**81**	**57**	**42**	**$9,039.49**	$111.60	97.36	**$7,886.16**	**$1,153.33**
Baxter & Bardstown	Cobra (OH)	**63**	**60**	**57**	**$10,000.11**	$158.73	97.36	**$6,133.68**	**$3,866.43**
LG&E Total		**666**	**449**	**40**	**$74,832.87**	**$112.36**	**$94.33**	**$62,824.39**	**$12,008.48**

KEY LESSONS LEARNED

OPERATIONS

- Projects should to be broken down into smaller areas to make it easier to manage during construction and on the backend for billing and GIS reconciliation. Exploring making each project 50 or less lights and targeting by street instead of the full target area
- Mapping inaccuracies
    - There is no real way to solve this without doing a full audit beforehand (billing data is accurate, but location is not sufficiently specific to use in place of GIS data)
    - Creating maps for construction months in advance allows for a time lag and lights get changed out on repairs before the actual conversion
    - Ensure delivery of as-built maps from contractor to LKE as work is completed. A GIS technician with CCS/SAP experience participating throughout the duration of the project would help smooth out any issues with timely map creation and billing reconciliation
- LED fixtures should be ordered and stored in smaller amounts to avoid issues with storage and tracking of inventory.
    - Job trailers should be arranged if additional capacity is needed or to help reduce travel times to work locations far from operations centers and storerooms.
- Enhanced communication between contractor and LKE when a project area is completed, and a new area is starting. Recommend a project manager to oversee project if done system wide, communicate schedule and milestone completion with business partners, and be a conduit for information between Asset Info, Billing, Contractors and Customers.

CONTRACTORS:

- Parked cars in city setting created delays on installs
    - Work with city to have cars moved from streets during workdays.
- No issues on main thoroughfares though most work performed when traffic was at a minimum due to COVID-19
    - Arrow board required
    - 9-3pm time constraint in Lexington (explore adjusting timeframe with LFUCG on LED conversion jobs)
- The current setup appears to be as efficient as practical – two-man teams, one bucket truck, one pickup truck carrying materials and arrow board for traffic control.

LED Lighting Replacement Program (Bradley Hayes-Lead)

A. Key Points

a. Customers are demanding LED lighting and have a mindset that LED's should be less expensive than traditional lighting because of lower energy consumption costs, reduced O&M, and the fact that the cost of the technology continues to decline.
b. LKE has 271k lights in the field which generate approximately $51m in revenue per year.
c. Customers do not want to see the Utility replace traditional lighting with old technology. Customer satisfaction is a factor.
d. Company has been under-collecting for various street lighting for many years as a result of rate case settlements.
e. Strategy will target customers currently served by traditional lighting technologies, where rate schedule would not negatively impact customers.

B. Triggers to Timeline

a. To be included in the 2020 Rate Cases.
b. Emerging and increased expectations of customers for additional and more efficient lighting offerings.
c. Obsolescence of traditional lighting technology offerings will necessitate future systematic replacement.
d. LED lighting rates in proposed 2018 rate cases are generally less expensive than rates for traditional lights.

C. Interdependencies

a. LKE is proposing to offer 16 new LED offerings in the 2018 Rate Cases, totaling 24 LED offerings
b. LKE proposes to no longer install new non-LED lights following approval of the 2018 Rate Cases
c. LKE proposes to replace failed non-LED lighting fixtures with a comparable LED.
d. LKE proposes to continue to maintain non-LED lighting fixtures by replacing bulbs and photoelectric controls
e. LKE proposes that proactive conversion to LEDs will be completed in response to customer demand. Customers will pay a monthly fee to convert a working HID light to an LED. The conversion fee is designed to recover the undepreciated net book value of fixtures that are in good working order, but are prematurely removed from service in response to a customer's request for an LED.
    i. The proposed KU monthly conversion fee is $6.12 for 5 years
    ii. The proposed LG&E monthly conversion fee is $7.49 for 5 years
f. When the conversion fee is removed from the cost, 76% of LKE's HID fixtures have a comparable LED fixture that is lower in cost.
g. Under the existing rate structure and due to the ongoing availability of traditional lighting fixtures, LKE anticipates that it cannot require customers to convert to a more expensive LED fixture. Currently, LKE's only ability to address any rate change associated to LED's or traditional lighting offerings is through a rate case.
h. A future triggering event is the anticipated phasing out of traditional lighting technologies by regulators, manufacturers, and/or market forces - reinforcing this opportunity and recommendation to be proactive in converting existing lights to LED's.

D. Alternatives

a. Do nothing or partial LED conversion (all Post-Top fixtures, all MV and MH fixtures, etc.).
b. A website landing page and handout materials to increase customer awareness and education around the Companies' lighting offerings is currently under development.

E. Recommendations

a. Maintenance based conversion of all 270k lights across the service territory – whenever LG&E or KU touches a fixture that fixture is replaced with a comparable LED - customers will continue to pay the same rate they pay today.
b. Traditional lighting can be replaced with compatible LED's at the same cost to the customer and any savings to the company will serve to recover undepreciated costs (assets that are removed and replaced).

F. Resources

a. Street Lighting is a core competency of the Company – a maintenance based conversion of HID lights to LEDs will allow the companies to largely use existing resources and complete a system-wide conversion in 6 to 8 years. Company will utilize both contract and employee workforce to complete this work. Additional contracts may be needed.
b. Project manager.

G. Financial

a. Costs are $125m over six to eight years beginning upon approval of 2020 rate cases.
b. This initiative is not currently in any BP plans though we are exploring whether there is room in EDO Capital Budgets for 2020 for a conversion pilot opportunity.

Hayes, Bradley

From: Hayes, Bradley
Sent: Tuesday, April 16, 2019 9:07 AM
To: Wolfe, John
Cc: Simon, Denise; Blake, Thomas
Subject: RE: LEDs - additional questions
Attachments: LED DCF Free Cash Flow Analysis - Final.xlsx

Hi John,

Attached is cash flow analysis of two potential LED conversion programs. Tom Blake and I worked together to develop a DCF model using various standard assumptions applicable to LKE (WACC, effective tax rates, tax depreciation schedules, etc.). The prevailing method for performing a DCF analysis is reflected in the Free Cash Flow analysis sheet, showing the present value cash flows prior to any interest or dividends paid to investors for providing the funds to invest in the LED project.

Free Cash Flow	
25 Year Plan	NPV (in '000s)
NPV of LED Capital Investment	$62,374
NPV of Customer Savings	$59,727
NPV Benefit (Cost)	($2,648)
6 Year Plan	
NPV of LED Capital Investment	$83,932
NPV of Customer Savings	$82,928
NPV Benefit (Cost)	($1,004)

The model is used to evaluate two scenarios: 1) 25 year plan - the plan proposed in the 2018 rate cases (i.e. replacing HID fixtures upon failure with LEDs and full conversion within 25 years). 2) 6 year plan – A 6 year system-wide maintenance based conversion (i.e. replacing HIDs with LEDs when the bulb/PEC fail). Both scenarios look at the cash flow impacts directly tied to the initial LED investment, do not include future expenses for LEDs to replace failed LEDs, and presume a 25 year life of LEDs. Those impacts are fuel savings (base fuel rates per the KPSC tariffs) and capital maintenance savings. There are no significant EDO O&M savings realized from a conversion to LEDs. I believe looking at conversion programs in this manner provides a favorable view of LEDs and that putting this into practice would reveal an even greater NPV cost of an LED conversion. In order to appropriately escalate expenses and savings, 3% annual increase was used for labor and materials and a 2% escalation was used for fuel costs.

I used the 6 year maintenance based conversion plan, rather than a systematic approach because it allows us to complete the conversion with existing resources and relatively known labor costs. Potential reduced labor costs may be realized through a systematic conversion but I have been unable to get comfortable with assumptions to realize those costs and as labor represents roughly 23% of the project cost, potential savings are discounted.

Best Regards,

Bradley Hayes
Group Leader Distribution Analytics and Special Contracts | LG&E and KU
820 West Broadway, Louisville, KY 40202

LKE Combined ($000s)

Scenario 1 - 2018 Rate Cases Plan - 25 years to complete

Free Cash Flow Needed to Convert to LED	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital Investment	$4,406	$4,538	$4,674	$4,814	$4,959	$5,107	$5,261	$5,418	$5,581	$5,748
Property Taxes	$68	$136	$203	$269	$335	$399	$463	$526	$587	$648
Income Taxes on Property Taxes	($17)	($34)	($51)	($67)	($83)	($100)	($115)	($131)	($147)	($162)
Income Taxes on Tax Depreciation	($157)	($431)	($636)	($793)	($914)	($1,040)	($1,169)	($1,253)	($1,291)	($1,330)
Cash Flow Needed to Convert to LED	$4,300	$4,209	$4,190	$4,224	$4,295	$4,367	$4,439	$4,559	$4,731	$4,905

Free Cash Flow Savings from Converting to LED	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital Maintenance Savings (net)	$0	$176	$363	$560	$770	$991	$1,225	$1,472	$1,732	$2,007
Fuel Savings	$0	$136	$278	$425	$578	$736	$901	$1,073	$1,250	$1,435
Property Taxes	$0	$3	$8	$17	$28	$42	$59	$79	$103	$129
Income Taxes on Property Taxes & Fuel Savings	$0	($35)	($71)	($110)	($151)	($194)	($240)	($287)	($338)	($390)
Income Taxes on Tax Depreciation	$0	($6)	($24)	($50)	($83)	($122)	($167)	($219)	($276)	($335)
Total Savings from converting to LED	$0	$274	$553	$842	$1,141	$1,453	$1,778	$2,117	$2,472	$2,845

Summary

NPV of LED Capital Investment	$62,374
NPV of Customer Savings	$59,727
NPV Benefit (Cost)	($2,648)

Scenario 2 - Bulb Maintenance Based LED Conversion plan - 6 years to complete

Free Cash Flow Needed to Convert to LED	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital Investment	$18,357	$18,908	$19,475	$20,059	$20,661	$21,281	$0	$0	$0	$0
Property Taxes	$285	$567	$846	$1,122	$1,394	$1,663	$1,588	$1,512	$1,437	$1,362
Income Taxes on Property Taxes	($71)	($142)	($211)	($280)	($348)	($415)	($396)	($377)	($359)	($340)
Income Taxes on Tax Depreciation	($654)	($1,796)	($2,651)	($3,302)	($3,810)	($4,333)	($4,091)	($3,078)	($2,214)	($1,598)
Cash Flow Needed to Convert to LED	$17,916	$17,538	$17,459	$17,599	$17,897	$18,196	($2,899)	($1,943)	($1,136)	($576)

Free Cash Flow Savings from Converting to LED	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital Maintenance Savings (net)	$0	$734	$1,511	$2,335	$3,206	$4,128	$5,102	$5,255	$5,413	$5,575
Fuel Savings	$0	$567	$1,157	$1,770	$2,407	$3,068	$3,756	$3,831	$3,907	$3,986
Property Taxes	($0)	$11	$34	$69	$116	$175	$246	$317	$387	$455
Income Taxes on Property Taxes & Fuel Savings	$0	($144)	($297)	($459)	($629)	($809)	($998)	($1,035)	($1,071)	($1,108)
Income Taxes on Tax Depreciation	$0	($26)	($99)	($208)	($346)	($508)	($697)	($881)	($1,031)	($1,150)
Total Savings from converting to LED	$0	$1,141	$2,306	$3,507	$4,754	$6,054	$7,409	$7,487	$7,605	$7,758

Summary

NPV of LED Capital Investment	$83,932
NPV of Customer Savings	$82,928
NPV Benefit (Cost)	($1,004)

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24
$5,921	$6,098	$6,281	$6,470	$6,664	$6,864	$7,070	$7,282	$7,500	$7,725	$7,957	$8,196	$8,442	$8,695
$708	$767	$825	$882	$938	$992	$1,046	$1,098	$1,149	$1,199	$1,248	$1,295	$1,341	$1,385
($177)	($191)	($206)	($220)	($234)	($248)	($261)	($274)	($287)	($299)	($311)	($323)	($335)	($346)
($1,370)	($1,411)	($1,453)	($1,497)	($1,542)	($1,588)	($1,635)	($1,685)	($1,735)	($1,787)	($1,841)	($1,896)	($1,953)	($2,011)
$5,083	$5,264	$5,448	$5,635	$5,826	$6,021	$6,219	$6,422	$6,628	$6,838	$7,053	$7,272	$7,495	$7,723

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24
$2,297	$2,603	$2,924	$3,263	$3,620	$3,994	$4,389	$4,803	$5,238	$5,695	$6,174	$6,677	$7,205	$7,759
$1,626	$1,825	$2,030	$2,243	$2,464	$2,693	$2,930	$3,175	$3,430	$3,692	$3,965	$4,246	$4,537	$4,838
$159	$192	$228	$268	$311	$358	$408	$462	$519	$581	$646	$715	$788	$865
($445)	($503)	($563)	($627)	($692)	($761)	($833)	($907)	($985)	($1,066)	($1,150)	($1,238)	($1,329)	($1,423)
($399)	($465)	($536)	($610)	($688)	($770)	($857)	($948)	($1,044)	($1,144)	($1,250)	($1,361)	($1,478)	($1,600)
$3,238	$3,650	$4,083	$4,538	$5,014	$5,514	$6,037	$6,585	$7,158	$7,757	$8,384	$9,040	$9,724	$10,439

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,286	$1,211	$1,136	$1,061	$985	$910	$835	$759	$684	$609	$534	$458	$383	$308
($321)	($302)	($283)	($265)	($246)	($227)	($208)	($189)	($171)	($152)	($133)	($114)	($96)	($77)
($1,157)	($704)	($237)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
($192)	$205	$616	$796	$739	$683	$626	$570	$513	$457	$400	$344	$287	$231

Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24
$5,743	$5,915	$6,092	$6,275	$6,463	$6,657	$6,857	$7,063	$7,275	$7,493	$7,718	$7,949	$8,188	$8,433
$4,065	$4,147	$4,230	$4,314	$4,400	$4,488	$4,578	$4,670	$4,763	$4,858	$4,956	$5,055	$5,156	$5,259
$523	$590	$656	$721	$785	$848	$909	$970	$1,029	$1,087	$1,144	$1,200	$1,254	$1,307
($1,145)	($1,182)	($1,219)	($1,256)	($1,294)	($1,331)	($1,369)	($1,407)	($1,445)	($1,483)	($1,522)	($1,561)	($1,599)	($1,638)
($1,248)	($1,332)	($1,400)	($1,452)	($1,495)	($1,540)	($1,586)	($1,634)	($1,683)	($1,733)	($1,785)	($1,839)	($1,894)	($1,951)
$7,938	$8,138	$8,359	$8,603	$8,860	$9,122	$9,389	$9,662	$9,939	$10,222	$10,510	$10,804	$11,104	$11,410

Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38
$8,956	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,428	$1,328	$1,230	$1,136	$1,044	$955	$870	$788	$709	$634	$562	$494	$430	$370
($356)	($331)	($307)	($283)	($260)	($238)	($217)	($197)	($177)	($158)	($140)	($123)	($107)	($92)
($2,072)	($1,805)	($1,296)	($932)	($672)	($487)	($296)	($100)	$0	$0	$0	$0	$0	$0
$7,956	($808)	($372)	($80)	$111	$230	$357	$492	$532	$476	$422	$371	$323	$278

Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38
$8,339	$8,589	$8,478	$8,353	$8,212	$8,056	$7,883	$7,692	$7,482	$7,254	$7,004	$6,733	$6,440	$6,123
$5,150	$5,042	$4,929	$4,809	$4,682	$4,548	$4,407	$4,259	$4,103	$3,939	$3,766	$3,586	$3,396	$3,198
$946	$1,026	$1,098	$1,164	$1,222	$1,273	$1,317	$1,354	$1,384	$1,406	$1,421	$1,428	$1,429	$1,422
($1,521)	($1,514)	($1,504)	($1,490)	($1,473)	($1,453)	($1,428)	($1,400)	($1,369)	($1,333)	($1,294)	($1,251)	($1,204)	($1,153)
($1,728)	($1,850)	($1,943)	($2,001)	($2,034)	($2,048)	($2,044)	($2,022)	($1,985)	($1,940)	($1,890)	($1,835)	($1,776)	($1,711)
$11,185	$11,293	$11,059	$10,834	$10,610	$10,378	$10,135	$9,882	$9,615	$9,325	$9,007	$8,661	$8,285	$7,879

Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$232	$163	$105	$60	$27	$7	$0	$0	$0	$0	$0	$0	$0	$0
($58)	($41)	($26)	($15)	($7)	($2)	($0)	($0)	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$174	$122	$79	$45	$20	$5	$0	$0	$0	$0	$0	$0	$0	$0

Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38
$8,686	$7,456	$6,144	$4,746	$3,259	$1,678	$0	$0	$0	$0	$0	$0	$0	$0
$5,364	$4,560	$3,721	$2,846	$1,935	$987	$0	$0	$0	$0	$0	$0	$0	$0
$1,358	$1,385	$1,387	$1,365	$1,317	$1,245	$1,148	$1,054	$963	$876	$792	$711	$635	$562
($1,677)	($1,483)	($1,274)	($1,051)	($812)	($557)	($286)	($263)	($240)	($218)	($198)	($177)	($158)	($140)
($2,009)	($2,017)	($1,931)	($1,774)	($1,559)	($1,296)	($983)	($680)	($450)	($284)	($163)	($74)	($19)	$0
$11,722	$9,901	$8,046	$6,133	$4,141	$2,058	($121)	$111	$272	$373	$431	$460	$458	$422

Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$314	$262	$214	$171	$132	$98	$69	$44	$25	$11	$3	($0)	$0	$0
($78)	($65)	($53)	($43)	($33)	($24)	($17)	($11)	($6)	($3)	($1)	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$235	$196	$161	$128	$99	$73	$51	$33	$19	$8	$2	($0)	$0	$0

Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52
$5,781	$5,413	$5,018	$4,594	$4,141	$3,656	$3,138	$2,585	$1,997	$1,371	$706	$0	$0	$0
$2,990	$2,772	$2,545	$2,307	$2,059	$1,800	$1,530	$1,249	$955	$650	$331	$0	$0	$0
$1,408	$1,387	$1,358	$1,323	$1,281	$1,231	$1,175	$1,112	$1,042	$966	$883	$794	$710	$632
($1,097)	($1,038)	($974)	($906)	($833)	($756)	($675)	($589)	($498)	($403)	($303)	($198)	($177)	($158)
($1,641)	($1,565)	($1,483)	($1,395)	($1,300)	($1,198)	($1,088)	($971)	($847)	($713)	($571)	($420)	($286)	($190)
$7,441	$6,970	$6,465	$5,924	$5,348	$4,733	$4,080	$3,386	$2,650	$1,871	$1,046	$176	$247	$285

Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$493	$428	$367	$310	$258	$210	$167	$129	$96	$68	$45	$28	$0	$0
($123)	($107)	($92)	($77)	($64)	($53)	($42)	($32)	($24)	($17)	($11)	($7)	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$370	$321	$275	$233	$194	$158	$126	$97	$72	$51	$34	$21	$0	$0

Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60	Year 61	Year 62	Year 63	Year 64	Year 65	Year 66	Year 67	Year 68	Year 69
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60	Year 61	Year 62	Year 63	Year 64	Year 65	Year 66	Year 67	Year 68	Year 69
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$559	$491	$429	$371	$319	$271	$228	$189	$155	$125	$98	$76	$57	$41	$29	$19	$12
($140)	($123)	($107)	($93)	($80)	($68)	($57)	($47)	($39)	($31)	($25)	($19)	($14)	($10)	($7)	($5)	($3)
($120)	($69)	($31)	($8)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$300	$300	$291	$271	$239	$203	$171	$142	$116	$93	$74	$57	$43	$31	$22	$14	$9

Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60	Year 61	Year 62	Year 63	Year 64	Year 65	Year 66	Year 67	Year 68	Year 69
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60	Year 61	Year 62	Year 63	Year 64	Year 65	Year 66	Year 67	Year 68	Year 69
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Year 70	Year 71	Year 72	Year 73	Year 74	Year 75	Total
$0	$0	$0	$0	$0	$0	$160,627
$0	$0	$0	$0	$0	$0	$31,828
$0	$0	$0	$0	$0	$0	($7,941)
$0	$0	$0	$0	$0	$0	($40,077)
$0	$0	$0	$0	$0	$0	$144,438

Year 70	Year 71	Year 72	Year 73	Year 74	Year 75	Total
$0	$0	$0	$0	$0	$0	$220,975
$0	$0	$0	$0	$0	$0	$129,511
$6	$3	$1	$0	($0)	$0	$43,638
($2)	($1)	($0)	($0)	$0	$0	($43,201)
$0	$0	$0	$0	$0	$0	($55,133)
$5	$2	$1	$0	$0	$0	$295,790

Year 70	Year 71	Year 72	Year 73	Year 74	Year 75	Total
$0	$0	$0	$0	$0	$0	$118,740
$0	$0	$0	$0	$0	$0	$23,528
$0	$0	$0	$0	$0	$0	($5,870)
$0	$0	$0	$0	$0	$0	($29,626)
$0	$0	$0	$0	$0	$0	$106,773

Year 70	Year 71	Year 72	Year 73	Year 74	Year 75	Total
$0	$0	$0	$0	$0	$0	$163,351
$0	$0	$0	$0	$0	$0	$108,801
$0	$0	$0	$0	$0	$0	$32,233
$0	$0	$0	$0	$0	$0	($35,188)
$0	$0	$0	$0	$0	$0	($40,756)
$0	$0	$0	$0	$0	$0	$228,440

let there be lights

Adding or enhancing outdoor lighting can improve visibility and make an area more welcoming.

We're proud to empower new, more efficient lighting options for our customers and the communities we serve.

empowering
evening walks
parallel parkers
early risers
commuters
businesses
downtown districts
neighborhoods
our community

Learn more at lge-ku.com/lighting or call 800-981-0600.

a PPL company

Outdoor LED Lighting Service

empowering more efficient lighting options

a PPL company

About This Service

KU offers a variety of outdoor LED lighting options for residential, business and industrial customers, as well as local governments within our service territory.

By partnering with KU, we will install and maintain your outdoor lighting for you. Customers who use this service pay a monthly fee, per installed light, that appears on their bill and covers the costs of the lighting installation, maintenance and electricity used.

If your lighting fixture goes out or requires maintenance, simply let us know and we'll respond within two business days at no additional cost to make the necessary repairs.

How It Works

1. Review our list of available energy-efficient LED lighting fixtures and poles. Please see the pricing insert for available options and associated costs. A contract may be required for installations.
2. Contact KU to schedule an appointment. We will help you make your selection and discuss what's needed for your LED lighting installation. This is a customizable service, so you decide what, where, and how many lighting fixtures you'd like to install.
3. Our trained service professionals will then install your new or replace your existing lighting fixtures and poles.

What are the benefits of LED lighting?

Compared to conventional lighting, LEDs offer the following benefits:

- More energy efficient by using 40-80% less energy
- Lifespan is 4x longer
- More environmentally-friendly
- Improved visibility by offering better field depth and peripheral vision

What is the cost to convert to LEDs?

If you are installing new lighting fixtures or your existing lighting fixture is broken or no longer working, you simply pay a monthly fee that appears on your bill.

If you proactively convert your current, working lighting fixtures to LEDs, there is an additional five-year, monthly conversion fee added to your service fee that appears on your monthly bill. This conversion fee represents the replacement costs of your current, working non-LED lighting fixture.

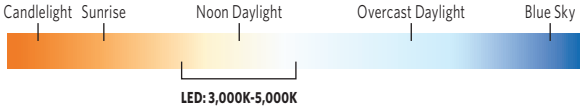
Can I choose to keep my existing non-LED lighting?

In 2019, we transitioned exclusively to LED lighting options through this service and will continue to maintain our existing non-LED lighting for a short time while supplies last. We will only replace your existing lighting fixture with a comparable LED fixture if it fails and cannot be fixed by simply replacing the bulb and photocontrol.

What lighting color options are available in LEDs?

We primarily offer LED lighting fixtures at 3,000 Kelvin, which most closely resembles "daylight at noon" and appears whiter in color compared to conventional lighting. We have several high-powered flood and contemporary lighting fixtures at 4,000 Kelvin, making them a brighter white and ideal for commercial parking lots.

Conventional lighting is considered "omni-directional," which means light emits from all directions, making it less effective at reaching your desired target. LEDs distribute light at sharper, more defined angles to illuminate directly in the intended direction. This helps cut down the loss of lumen, or lighting, making it much more efficient.



Outdoor LED Lighting Service
Underground Electric

a PPL company

Below pricing does not reflect the **$6.03 conversion fee per light** that applies when proactively exchanging existing lighting in working order with LEDs. Additional charges may apply where excess facilities are required.

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Cobra 	Type D	70w	Brushed Aluminum Pole	$4.00	KC2	$12.12	PK1	$16.12
	Type A	100w		$5.24	396	$12.12	PK1	$17.36
	Type B	200w		$7.30	397	$12.12	PK1	$19.42
	Type C*	400w		$10.54	398	$12.12	PK1	$22.66

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Contemporary 	Type N	70w	Black Aluminum Pole	$6.87	KN1	$11.64	PK2	$18.51
	Type P	100w		$8.00	KN2	$11.64	PK2	$19.64
	Type R^	200w		$9.74	KN3	$11.64	PK2	$21.38
	Type S^*	400w		$14.13	KN4	$11.64	PK2	$25.77
	Type T^*	1000w		$21.32	KN5	$11.64	PK2	$32.96

^Two contemporary fixtures may be mounted on one pole.

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Directional Flood 	Type U	100w	$8.17	KF5
	Type V	200w	$10.00	KF6
	Type W*	400w	$12.38	KF7
	Type X*	1000w	$19.09	KF8

Typically installed on existing poles.

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Colonial 	Type H	100w	Decorative Smooth	$7.41	399	$8.01	PK3	$15.42
Acorn 	Type K	70w or 100w	Decorative Smooth	$8.83	KA1	$8.01	PK3	$16.84
			Historic Fluted	$8.83	KA1	$15.02	PK4	$23.85

*Not available in residential areas unless requested by a government authority.

See reverse for more >

Outdoor LED Lighting Service
Overhead Electric

a PPL company

Below pricing does not reflect the **$6.03 conversion fee per light** that applies when proactively exchanging existing lighting in working order with LEDs. Additional charges may apply where new wood poles or other excess facilities are required.

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Cobra 	Type D	70w	$8.67	KC1
	Type A	100w	$9.92	390
	Type B	200w	$11.98	391
	Type C*	400w	$15.22	392

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Open Bottom 	Type M	100w	$8.57	393

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Directional Flood 	Type U	100w	$11.28	KF1
	Type V	200w	$13.10	KF2
	Type W*	400w	$15.49	KF3
	Type X*	1000w	$22.20	KF4

*Not available in residential areas unless requested by a government authority.

See reverse for more

let there be lights

Adding or enhancing outdoor lighting can improve visibility and make an area more welcoming.

We're proud to empower new, more efficient lighting options for our customers and the communities we serve.

empowering
- evening walks
- parallel parkers
- early risers
- commuters
- businesses
- downtown districts
- neighborhoods
- our community

Learn more at lge-ku.com/lighting or call 502-589-1444 (local) or 800-331-7370 (outside Louisville).

LG&E a PPL company

Outdoor LED Lighting Service

empowering more efficient lighting options

LG&E a PPL company

About This Service

LG&E offers a variety of outdoor LED lighting options for residential, business and industrial customers, as well as local governments within our service territory.

By partnering with LG&E, we will install and maintain your outdoor lighting for you. Customers who use this service pay a monthly fee, per installed light, that appears on their bill and covers the costs of the lighting installation, maintenance and electricity used.

If your lighting fixture goes out or requires maintenance, simply let us know and we'll respond within two business days at no additional cost to make the necessary repairs.

How It Works

1. Review our list of available energy-efficient LED lighting fixtures and poles. Please see the pricing insert for available options and associated costs. A contract may be required for installations.
2. Contact LG&E to schedule an appointment. We will help you make your selection and discuss what's needed for your LED lighting installation. This is a customizable service, so you decide what, where, and how many lighting fixtures you'd like to install.
3. Our trained service professionals will then install your new or replace your existing lighting fixtures and poles.

What are the benefits of LED lighting?

Compared to conventional lighting, LEDs offer the following benefits:

- More energy efficient by using 40-80% less energy
- Lifespan is 4x longer
- More environmentally-friendly
- Improved visibility by offering better field depth and peripheral vision

What is the cost to convert to LEDs?

If you are installing new lighting fixtures or your existing lighting fixture is broken or no longer working, you simply pay a monthly fee that appears on your bill.

If you proactively convert your current, working lighting fixtures to LEDs, there is an additional five-year, monthly conversion fee added to your service fee that appears on your monthly bill. This conversion fee represents the replacement costs of your current, working non-LED lighting fixtures.

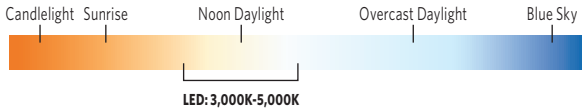
Can I choose to keep my existing non-LED lighting?

In 2019, we transitioned exclusively to LED lighting options through this service and will continue to maintain our existing non-LED lighting for a short time while supplies last. We will only replace your existing lighting fixture with a comparable LED fixture if it fails and cannot be fixed by simply replacing the bulb and photocontrol.

What lighting color options are available in LEDs?

We primarily offer LED lighting fixtures at 3,000 Kelvin, which most closely resembles "daylight at noon" and appears whiter in color compared to conventional lighting. We have several high-powered flood and contemporary lighting fixtures at 4,000 Kelvin, making them a brighter white and ideal for commercial parking lots.

Conventional lighting is considered "omni-directional," which means light emits from all directions, making it less effective at reaching your desired target. LEDs distribute light at sharper, more defined angles to illuminate directly in the intended direction. This helps cut down the loss of lumen, or lighting, making it much more efficient.



Outdoor LED Lighting Service
Underground Electric

LG&E a PPL company

Below pricing does not reflect the **$7.37 conversion fee per light** that applies when proactively exchanging existing lighting in working order with LEDs. Additional charges may apply where excess facilities are required.

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Cobra 	Type D	70w	Black Aluminum Pole or Aluminum Davit Pole (Downtown Metro)	$3.82	LC2	$30.04	PL1	$33.86
	Type A	150w		$5.05	496	$30.04	PL1	$35.09
	Type B	250w		$7.04	497	$30.04	PL1	$37.08
	Type C*	400w		$10.16	498	$30.04	PL1	$40.20

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Contemporary 	Type N	85w	16′ Bronze Aluminum Pole	$6.55	LN1	$14.49	PL2	$21.04
	Type P	150w		$7.65	LN2	$14.49	PL2	$22.14
	Type R^	225w	30′ Bronze Aluminum Pole	$9.34	LN3	$21.26	PL3	$30.60
	Type S^*	400w		$13.55	LN4	$21.26	PL3	$34.81
	Type T^*	1000w		$20.49	LN5	$21.26	PL3	$41.75

^Two contemporary may be mounted on one pole.

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Directional Flood 	Type U	85w	$7.61	LF5
	Type V	175w	$9.40	LF6
	Type W*	400w	$11.73	LF7
	Type X*	1000w	$18.17	LF8

Typically installed on existing poles.

Fixture	Label	Wattage Equivalence	Pole Type	Fixture Price	Fixture Rate Code	Pole Price	Pole Rate Code	Fixture + Pole Total
Colonial 	Type H	100w	Smooth Black Aluminum Pole	$7.04	499	$14.29	PL4	$21.33
Acorn 	Type K	100w	Smooth Black Aluminum Pole	$6.54	LA1	$14.29	PL4	$20.83

*Not available in residential areas unless requested by a government authority.

See reverse for more >

Outdoor LED Lighting Service
Overhead Electric

LG&E a PPL company

Below pricing does not reflect the **$7.37 conversion fee per light** that applies when proactively exchanging existing lighting in working order with LEDs. Additional charges may apply where new wood poles or other excess facilities are required.

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Cobra 	Type D	70w	$8.13	LC1
	Type A	150w	$9.37	490
	Type B	250w	$11.36	491
	Type C*	400w	$13.30	492

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Open Bottom 	Type M	100w	$8.52	493

Fixture	Label	Wattage Equivalence	Fixture Price	Fixture Rate Code
Directional Flood 	Type U	85w	$10.86	LF1
	Type V	175w	$12.65	LF2
	Type W*	400w	$14.98	LF3
	Type X*	1000w	$21.42	LF4

*Not available in residential areas unless requested by a government authority.

See reverse for more

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 6

Responding Witness: John K. Wolfe

Q-6. Identify the useful life for each type of fixture within the proposed Restricted Lighting Service tariff.

A-6. The estimated useful life for each RLS fixture is 25 years.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 7

Responding Witness: John K. Wolfe

Q-7. LED fixtures service lives typically range from 50,000 to 100,000, and may extend as high as 250,000 hours or 12.5, 25, or 62 years respectively. As such these extended life spans, should lead to projections of lower annual O&M costs as a component of rate construction. Yet the projected LED LS rates remain at, near, or even higher than the RLS they are replacing.

a. Is there a projected timeframe or LED saturation level where the Company expects these O&M levels to begin to go down to reflect the reduced O&M costs of LED fixtures?

b. If the Company does not believe increased deployment of LED fixtures will reduce the O&M costs for leased lighting please elaborate why?

c. Additionally, public entities have seen a drastic reduction in the cost of outdoor area lighting on the scale of 50% or greater in the past several years, while efficiency continues to increase. Again, the current LED LS rate constructions appear not to reflect this significant downward trend in fixture costs. Please explain the Company's experience in LED fixture costs over the past several years?

A-7. The Company uses an estimated useful life of 100,000 hours or 25 years (based on 4,000 burn hours per year). While some LED fixtures have a calculated or theoretical lumen maintenance (L70) of 250,000 hours, the other components of those fixtures are generally rated for no more than 100,000 hours and no vendor has offered a warranty for more than 10 years.

a. No. All O&M savings are built into the proposed LS rates and passed through to the customers.

b. LED fixtures will reduce costs to customers, primarily in the area of energy savings and overall cost of ownership. This can be seen in that 85% of existing RLS fixtures have a comparable LED with a lower monthly rate. The cost built into the Company's proposed LED rates include capital installation costs, fixed

carrying charge (rate of return, straight line depreciation, income taxes, property taxes), annual distribution energy at LE rate, and non-fixture O&M cost of $2.71-KU per fixture per year. That non-fixture O&M cost represents the Company's O&M expenses for repair efforts such as cable repairs (not cable replacement), fixing leaning poles, replacing globes/refractors/shields, etc. These O&M expenses are not expected to change as a result of LED deployment. The LED LS rates do not include the capital costs to replace the bulbs and photo controls of RLS fixtures, which represent the majority of lighting repairs and are generally thought to be an area of significant O&M savings for lighting customers and providers. Capital maintenance expenses are not expressly captured in the LS/RLS rate design, those expenses are captured through the carrying cost, specifically the depreciation schedule (which is based on the LED's expected useful life and essentially represents the typical replacement schedule). Furthermore, the Company's RLS rates do not represent the true cost of ownership for those fixtures due to downward pressure on those rates through historical rate case settlements. Additionally, the Company continues to see increases in labor costs for Line Technician resources who perform installation and maintenance of lighting assets, pushing LS LED rates higher.

c. KU and its customers have already realized most of the cost reductions attributable to increased LED fixture efficiency. LED efficiency is subject to the law of diminishing returns. Early on in LED manufacturing, LED efficiency saw massive, dramatic improvements. This meant that LED chips could be made smaller, put out more lumens, and more lumens per watt. This allowed manufacturers to reduce the size of the LED fixtures/housings, saving expenses on metals required for production. As LED technology became more ubiquitous, the LED chips/boards also became cheaper to produce and acquire. This is evidenced by the fixture prices built into proposed rates in the Company's 2016 rate case, compared to those in the 2018 rate cases. The Company, and thus its customers, did realize some savings from reduced fixture prices between the 2016 rate cases and the 2018 rate cases. The gains from more efficient LEDs and smaller fixtures has started to level off over the past 2-3 years and as a direct result, LED fixture prices have also leveled off and the Company has started to see typical year-to-year increases seen in other materials and goods. See the table below for a comparison of rates and fixture prices from the proposed rates in the Company's 2016, 2018, and 2020 rate cases.

Kentucky Utilities						
	2016		*2018*		*2020*	
Rate Code	*Proposed Rate*	*Fixture Price*	*Proposed Rate*	*Fixture Price*	*Proposed Rate*	*Fixture Price*
393	*$10.13*	*$150.25*	*$8.80*	*$125.40*	*$7.84*	*$126.07*
390	*$15.21*	*$228.50*	*$10.23*	*$148.50*	*$9.58*	*$167.23*
391	*$18.42*	*$298.50*	*$12.34*	*$203.50*	*$11.55*	*$218.06*
392	*$28.09*	*$572.50*	*$15.67*	*$302.50*	*$14.86*	*$324.39*
396	*$36.27*	*$228.50*	*$17.89*	*$148.50*	*$18.12*	*$167.23*
397	*$39.47*	*$298.50*	*$20.01*	*$203.50*	*$20.10*	*$218.06*
398	*$49.15*	*$572.50*	*$23.34*	*$302.50*	*$23.41*	*$324.37*
399	*$38.32*	*$662.50*	*$15.90*	*$330.00*	*$15.91*	*$330.40*

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 8

Responding Witness: John K. Wolfe

Q-8. What is the percentage of street lights throughout the Company's system that is an LED light?

A-8. As of November 2020, 4.74% of outdoor lights provided by the Company to customers are LED lights.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 9

Responding Witness: John K. Wolfe

Q-9. Does the Company have any systematic plans to convert restricted lighting to LED, such as geography or rate code?

A-9. No. The Company will continue to provide fixtures and poles for non-LED lights as existing fixtures and poles need to be replaced, but will do so only from the Company's existing inventory. When those inventory items are exhausted, a lighting customer whose non-LED fixture or pole needs to be replaced will need to convert to a new LED fixture, pole, or both under Rate LS. The Company has exhausted its inventory of Rate RLS fixtures in the Lexington area and all future replacements will be with a Rate LS LED fixture.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 10

Responding Witness: John K. Wolfe

Q-10. In a prior rate case, the Company defined the end of service life for an LED fixture when the fixture fails completely or lumen output is reduced below 70% (L70) of initial output rating.

a. Does the Company still use the same definition for end of service life for an LED fixture?

b. What are the Company's plans for service/maintenance for LED lights when they near or reach the end of service?

c. When sourcing or purchasing LED fixtures, does the Company have a minimum allowable/acceptable L70 rating for fixtures in hours? If so, what is that rating?

d. Please provide the L70 rating for each LS LED fixture/rate code currently in use.

A-10.

a. Yes. The Company defines end of service for an LED as when the fixture fails or when the lumens depreciate to 70% of their initial output (L70) and that depreciation becomes noticeable to the human eye.

b. LED fixtures will be replaced upon failure or when, after customer request or visual inspection, Company personnel determine the LED should be replaced because the lumen output has depreciated beyond a reasonable level.

c. L70 is not a deciding factor in fixture selection because the Company expects other components of the LED fixture (e.g., transformer/driver or surge protectors) to fail prior to the LEDs reaching L70. Nonetheless, the Company expects all of the LED fixtures to have an L70 of at least 100,000 hours. Due to the integrated design of LED fixtures, failure of these other components requires replacement of the entire LED fixture.

d. See attached.

L70 or L## Values for LS Rate Codes (LED Fixtures)

LGE Rate Code	KU Rate Code	Fixture Type	L70 rating	L## at 100,000 hours*	
490	390	Cobra	100,000+	L84	
491	391	Cobra	100,000+	L88	
492	392	Cobra	100,000+	L91	
493	393	Open Bottom	220,000		
LC1	KC1	Cobra	100,000+	L91	
LF1	KF1	Directional (Flood)	100,000+	L89	
LF2	KF2	Directional (Flood)	100,000+	L89	
LF3	KF3	Directional (Flood)	100,000+	L89	
LF4	KF4	Directional (Flood)	100,000+	L86	at 25°C
LC2	KC2	Cobra	100,000+	L91	
496	396	Cobra	100,000+	L84	
497	397	Cobra	100,000+	L88	
498	398	Cobra	100,000+	L91	
499	399	Colonial	204,000		
LA1	KA1	Acorn	139,000		
LN1	KN1	Contemporary		L88	at 60,000 hours
LN2	KN2	Contemporary		L88	at 60,000 hours
LN3	KN3	Contemporary		L88	at 60,000 hours
LN4	KN4	Contemporary	100,000+	L81	
LN5	KN5	Contemporary	100,000+	L84	
LF5	KF5	Directional (Flood)	100,000+	L89	
LF6	KF6	Directional (Flood)	100,000+	L89	
LF7	KF7	Directional (Flood)	100,000+	L89	
LF8	KF8	Directional (Flood)	100,000+	L86	at 25°C
LV1		Victorian	100,000+^		
LL1	KV1	London/Victorian	100,000+^		

*These manufacturers do not provide an L70 value. Alternatively, they provide Lumen Maintenance values (L##) at 100,000 hours (or 60,000 hours). If that L## value is greater than L70 then the L70 value exceeds 100,000 hours

^This manufacturer provides a calculated L70 value that reads ">100,000"

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 11

Responding Witness: John K. Wolfe

Q-11. The Energy Policy Act of 2005 – Section 135 H.R. 6-39 states that "Mercury vapor lamp ballasts . . . shall not be manufactured or imported after January 1, 2008."

a. What is the status of the Company's inventory for mercury vapor replacement?

b. When is conversion to from mercury vapor to LED anticipated?

c. Since lamp replacements for these MV fixtures are not consistent with the 2005 Act. Has the Company used a different projection methodology for the replacement of these fixtures? If so, when does the Company anticipate all MV fixtures will be converted?

A-11.

a. The Company does not maintain an inventory of mercury vapor fixtures.

b. See the response to Question No. 9.

c. Lamp replacements for mercury vapor fixtures are consistent with federal law; only the manufacture or importation of mercury vapor lamp ballasts is forbidden. This necessitates replacing mercury vapor lighting over time as ballasts fail and cannot be replaced. The Company continues to purchase and replace mercury vapor lamps, and does not have a different projection methodology for replacement of mercury vapor fixtures.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 12

Responding Witness: John K. Wolfe

Q-12. Please refer to the RLS Tariff. It states: "In the event restricted fixtures/poles fail and replacements are unavailable, Customer will be given the choice of having Company remove the failed fixture/pole or replacing the failed fixture/pole with other available fixture/pole." The range of lumen output in the new rates complicates a photometric study.

a. How will the Company assist municipalities in evaluating roadway illumination for the new LS rate options?

b. Please provide an updated cross-reference table (excel) that associates all existing RLS rate codes with their LS LED equivalent(s). Please ensure the cross reference table includes the RLS and LS cost, and if applicable for LS rates the pole category and charges.

A-12.

a. The Company provides a recommended comparable LED fixture to replace each RLS fixture. Upon request, the Company can provide additional details about each LED fixture, including lumen output, light pattern, and IES files.

b. See attached.

The attachment is being provided in a separate file in Excel format.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 13

Responding Witness: John K. Wolfe

Q-13. Please state how many new public street lights were installed by KU for each of the past three years, indicating the types of lights installed and the number of these lights which replaced previously existing street lights, for the following: Lexington-Fayette Urban County Government; KU's Kentucky jurisdictional operations; and KU's entire system.

A-13. KU has a long-standing practice of maintaining a database of all lighting related activities in Lexington-Fayette County. KU and LG&E do not replicate this practice anywhere else in the service territories. KU does not have a business need to track information at this level for public street lights in KU jurisdictional operations or KU's entire system.

See attached.

Summary of Work Performed for Specific Time Period - 2020

Beginning Date: 1/1/2020
Ending Date: 12/31/2020

Office: 311

LED upgrade projects Tree Lane & MOW — Elm

ACCOUNT	BILL CODE	POLE CAT	LUMENS	BULB TYPE	new NSTALLED	REMOVED	upgraded from	upgraded to	upgraded from	upgraded to	combined OOH & OUG accts per LFUCG req OOH	OUG
0000013094	474	OUG	22000	S	0	17	83		291			
0000031215	463	SOH	09500	S	0	3	14		41			
0000054279	462	SOH	05800	S	0	1	15		144			
0000077417	461	SOH	04000	S	0	6	1		9			
0000096352	458	OUG	20000	M	0	18	57					132
0000102020	473	OOH	09500	S	0	1	2				46	
0000123526	472	OUG	05800	S	0	0	122		10			137
0000144936	471	OUG	04000	S	2	1	35					24
0000168223	474	OOH	22000	S	0	13	22		10			
0000190608	472	OOH	05800	S	0	0	3				137	
0000196146	447	SOH	10000	M	1	9	43		21			
0000209113	471	OOH	04000	S	0	0	0				24	
0000236539	475	OOH	50000	S	0	0	2				53	
0000253840	473	OUG	09500	S	0	3	55		22			46
0000302281	465	SOH	50000	S	0	1	6		2			
0000320125	457	OOH	10000	M	0	1	3				4	
0000321033	464	SOH	22000	S	0	3	17		14			
0000342277	475	OUG	50000	S	0	3	19		10			53
0000426585	457	OUG	10000	M	0	1	28		2			4
0000537554	448	SOH	20000	M	0	2	18		1			
0000646942	458	OOH	20000	M	0	0	0				132	
0000667301	476	CNT	05800	S	0	0	17		102			
0000667310	478	CNT	22000	S	0	2	9					
0000667317	479	CNT	50000	S	0	3	2					
0000667317	479	CNT	50000	S	1	0	0					
0000667376	477	CNT	09500	S	0	0	5					
0001019158	468	CLN	09500	S	22	0	4					
0001455001	KN1	PK2	04000	L	51	0		18		102		
0001455002	391	SOH	13000	L	0	0		27		21		
0001455003	KC2	PK1	02000	L	12	1		130		10		
0001455004	397	PK1	13000	L	21	1		157		301		
0001455011	KN2	PK2	08000	L	31	1		3				
0001461313	396	PK1	06000	L	34	0		108		24		
0001461314	398	PK1	22000	L	3	0		36		10		
0001461315	399	CLN	04000	L	0	1		0				
0001461315	399	PK3	04000	L	0	0		4				
0001461317	KC1	SOH	02000	L	0	0		24		153		
0001461318	390	SOH	06000	L	1	0		48		56		
0001461319	392	SOH	22000	L	1	0		20		3		
0001461713	KN4	PK2	21000	L	3	0		2				
0001462502	KN3	PK2	13000	L	6	0		11				
							582	588	679	680	396	396
				TOTALS:	**188**	**92**						

diff of 1 light due to found light on Breckinridge

Summary of Work Performed for Specific Time Period - 2019

Beginning Date: 1/1/2019
Ending Date: 12/31/2019
Office: 311

ACCOUNT	BILL CODE	POLE CAT	LUMENS	BULB TYPE	INSTALLED	REMOVED	CHANGED
0000013094	474	OUG	22000	S	0	7	91
0000013094	474	OUG	22000	S	22	0	0
0000031215	463	SOH	09500	S	0	2	58
0000031215	463	SOH	09500	S	33	0	0
0000054279	462	SOH	05800	S	0	5	48
0000054279	462	SOH	05800	S	10	0	0
0000077417	461	SOH	04000	S	0	13	6
0000077417	461	SOH	04000	S	1	0	0
0000096352	458	OUG	20000	M	0	7	1
0000096352	458	OUG	20000	M	3	0	0
0000102020	473	OOH	09500	S	0	0	3
0000123526	472	OUG	05800	S	0	17	150
0000123526	472	OUG	05800	S	25	0	0
0000144936	471	OUG	04000	S	0	2	9
0000144936	471	OUG	04000	S	2	0	0
0000168223	474	OOH	22000	S	0	3	52
0000168223	474	OOH	22000	S	3	0	0
0000190608	472	OOH	05800	S	0	0	3
0000196146	447	SOH	10000	M	0	10	0
0000196146	447	SOH	10000	M	6	0	0
0000209113	471	OOH	04000	S	0	0	0
0000236539	475	OOH	50000	S	0	0	5
0000253840	473	OUG	09500	S	0	0	51
0000253840	473	OUG	09500	S	19	0	0
0000302281	465	SOH	50000	S	0	7	16
0000302281	465	SOH	50000	S	4	0	0
0000320125	457	OOH	10000	M	0	0	0
0000321033	464	SOH	22000	S	0	7	36
0000321033	464	SOH	22000	S	2	0	0
0000342277	475	OUG	50000	S	0	4	13
0000342277	475	OUG	50000	S	1	0	0
0000426585	457	OUG	10000	M	0	0	1
0000537554	448	SOH	20000	M	0	5	3
0000646942	458	OOH	20000	M	0	2	1
0000667301	476	CNT	05800	S	0	3	0
0000667301	476	CNT	05800	S	49	0	0
0000667310	478	CNT	22000	S	0	1	1
0000667310	478	CNT	22000	S	2	0	0
0000667317	479	CNT	50000	S	0	4	1
0000667376	477	CNT	09500	S	0	7	6
0001455001	KN1	PK2	04000	L	5	0	0
0001455003	KC2	PK1	02000	L	11	0	0
0001461713	KN4	PK2	21000	L	1	0	0
0001462502	KN3	PK2	13000	L	2	0	0
				TOTALS:	**201**	**106**	**555**

Summary of Work Performed for Specific Time Period - 2018

Beginning Date: 1/2/2018
Ending Date: 12/31/2018
Office: 311

ACCOUNT	BILL CODE	POLE CAT	LUMENS	BULB TYPE	INSTALLED	REMOVED	CHANGED
0000013094	474	OUG	22000	S	0	9	67
0000013094	474	OUG	22000	S	15	0	0
0000031215	463	SOH	09500	S	0	22	37
0000031215	463	SOH	09500	S	12	0	0
0000054279	462	SOH	05800	S	0	37	13
0000054279	462	SOH	05800	S	29	0	0
0000077417	461	SOH	04000	S	0	1	1
0000096352	458	OUG	20000	M	0	15	2
0000102020	473	OOH	09500	S	0	0	3
0000123526	472	OUG	05800	S	0	15	53
0000123526	472	OUG	05800	S	61	0	0
0000144936	471	OUG	04000	S	0	0	9
0000144936	471	OUG	04000	S	1	0	0
0000168223	474	OOH	22000	S	0	15	37
0000168223	474	OOH	22000	S	8	0	0
0000190608	472	OOH	05800	S	0	1	3
0000190608	472	OOH	05800	S	1	0	0
0000196146	447	SOH	10000	M	0	0	2
0000209113	471	OOH	04000	S	0	0	1
0000236539	475	OOH	50000	S	0	1	3
0000253840	473	OUG	09500	S	0	4	45
0000253840	473	OUG	09500	S	26	0	0
0000302281	465	SOH	50000	S	0	0	8
0000302281	465	SOH	50000	S	1	0	0
0000320125	457	OOH	10000	M	0	0	0
0000321033	464	SOH	22000	S	0	1	20
0000321033	464	SOH	22000	S	16	0	0
0000342277	475	OUG	50000	S	0	0	12
0000342277	475	OUG	50000	S	1	0	0
0000426585	457	OUG	10000	M	0	2	0
0000537554	448	SOH	20000	M	0	1	0
0000646942	458	OOH	20000	M	0	8	4
0000646942	458	OOH	20000	M	5	0	0
0000667301	476	CNT	05800	S	0	0	0
0000667301	476	CNT	05800	S	30	0	0
0000667310	478	CNT	22000	S	0	0	2
0000667317	479	CNT	50000	S	0	1	1
0000667376	477	CNT	09500	S	0	0	22
				TOTALS:	**206**	**133**	**345**

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 14

Responding Witness: John K. Wolfe

Q-14. For each of the past three years, please provide the number of street lights that KU had planned on replacing prior to that year, and a summary of the actual number replaced that year for the following: Lexington-Fayette Urban County Government (extrapolate if needed); KU's Kentucky jurisdictional operations; and KU's entire system.

A-14. The Company completed a planned, systematic conversion of 681 RLS fixtures paid for by LFUCG to LS LED fixtures to understand the true cost of a proactive LED conversion, in order to compare against the current cost of replacing those fixtures during routine maintenance upon failure. The Company otherwise had no planned replacements of street lights for each of the past three years. The Company replaces street lights at the request of customers, or when dictated by failure, damage, or unsatisfactory physical condition.

The Company does not track replacements by customers. The Company replaced fixtures in the approximate amounts indicated below.

	2018	2019	2020
KU Jurisdictional	1913	1848	2525
KU Entire System	2012	1994	2610

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 15

Responding Witness: John K. Wolfe

Q-15. Please explain in detail KU's current policies, procedures, practices, and/or guidelines for maintaining street lights in Fayette County and provide copies of the same.

a. Does KU regularly inspect individual street lights or the collective street lighting in Fayette County?

b. Do these inspections take place only upon the receipt by KU of a complaint regarding a particular street light?

c. What is the average response time to replace a non-working street light in Fayette County?

d. Does this information differ depending upon the type of street light? If so, please provide a detailed explanation.

e. Would AMI deployment as proposed in the Company's application provide information to the Company that would improve any of the response times or costs related to lighting?

A-15. The Company maintains its street lights and other lighting products consistent with the original Company installation standards, the Terms and Conditions of the Lighting Service and Restricted Lighting Service Schedules, and in compliance with 807 KAR 5:041. Electric: Section 2 – General Requirements, Section 3 – Acceptable Standards, and Section 5 – Maintenance or Continuity of Service. See attached for a copy of these installation standards.

a. The Company conducts proactive lighting patrols as part of its normal operations. These night-time patrols are integrated into the Company's normally scheduled operations for outage response activities. When not responding to outages, the Company's outage technicians, who are on duty 24 hours a day, 7 days a week, undertake lighting patrol and maintenance activities, among other duties that they perform daily.

STREET LIGHT PATROL/REPAIR SCHEDULE

In addition to needed street light repairs reported via the public, LFUCG, and internally, concerted patrol and repairs are performed on the following annual schedule:

MONTH	ZONE	ZIP CODE
JAN	1	40507
JAN	2	40508
FEB	3	40505
MAR	4	40502
APR	5	40511
MAY	6	40503
JUN	7	40509
JUL	8	40504
AUG	9	40517
SEPT	10	40516
SEPT	11	40513
OCT	12	40515
NOV	13	40514
DEC	14	40510

Arterials are scheduled for patrol semi-annually in February and November to identify and repair those lights along the following routes:

Man-O-War Blvd – New Circle Road
Versailles Road – Winchester Road
Harrodsburg Road – Paris Pike
Nicholasville Road – Newtown Pike
Tates Creek Road – Georgetown Road
Richmond Road – Leestown Road

b. The Company also issues repair orders in response to light outages reported by Company employees and contractors, customers, LFUCG personnel, police, fire departments, and the general public. Outages can be reported via:

1. Website: https://lge-ku.com/outages/report/streetlight

2. Residential Call Center: 1-800-981-0600

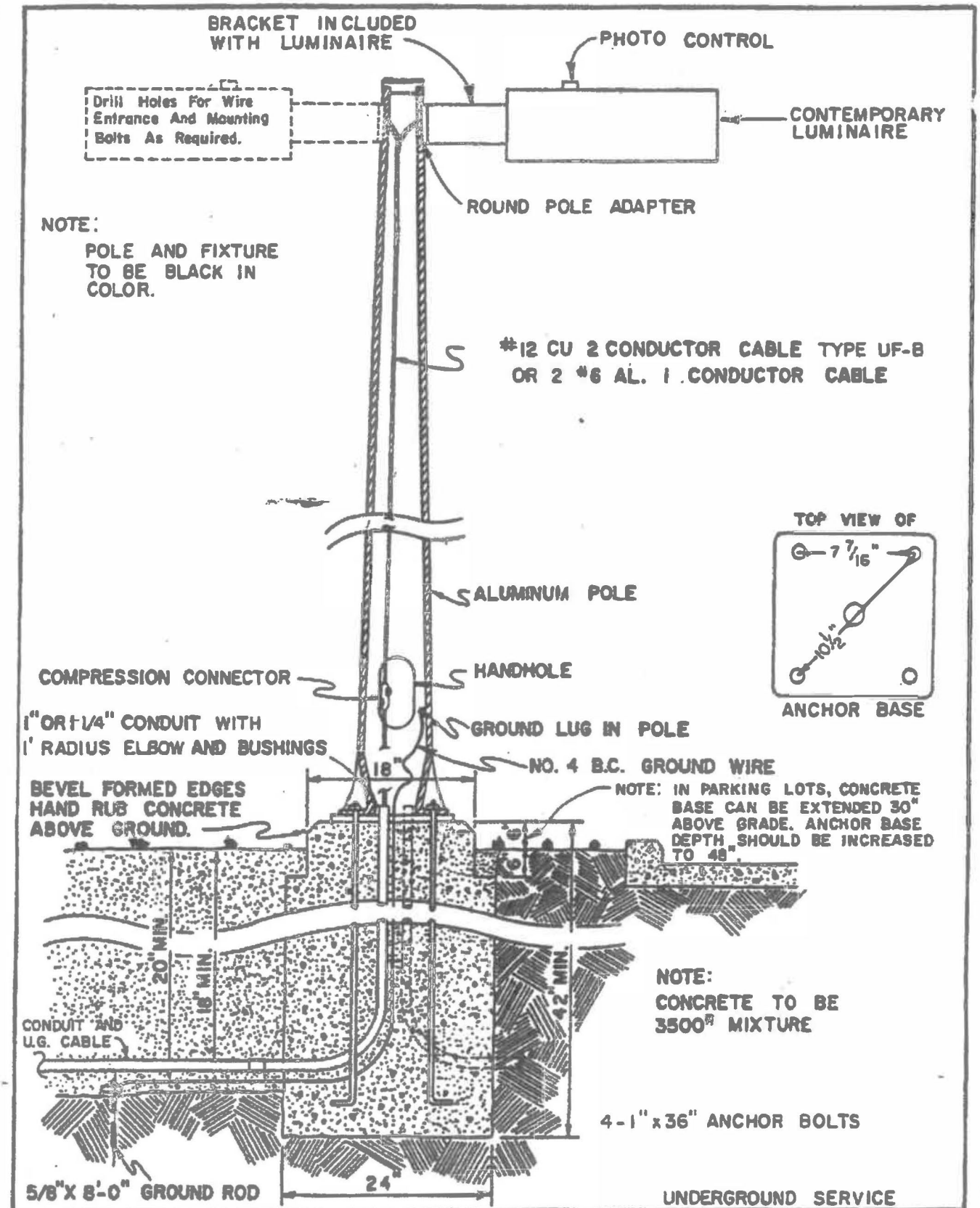
3. LexCall 311

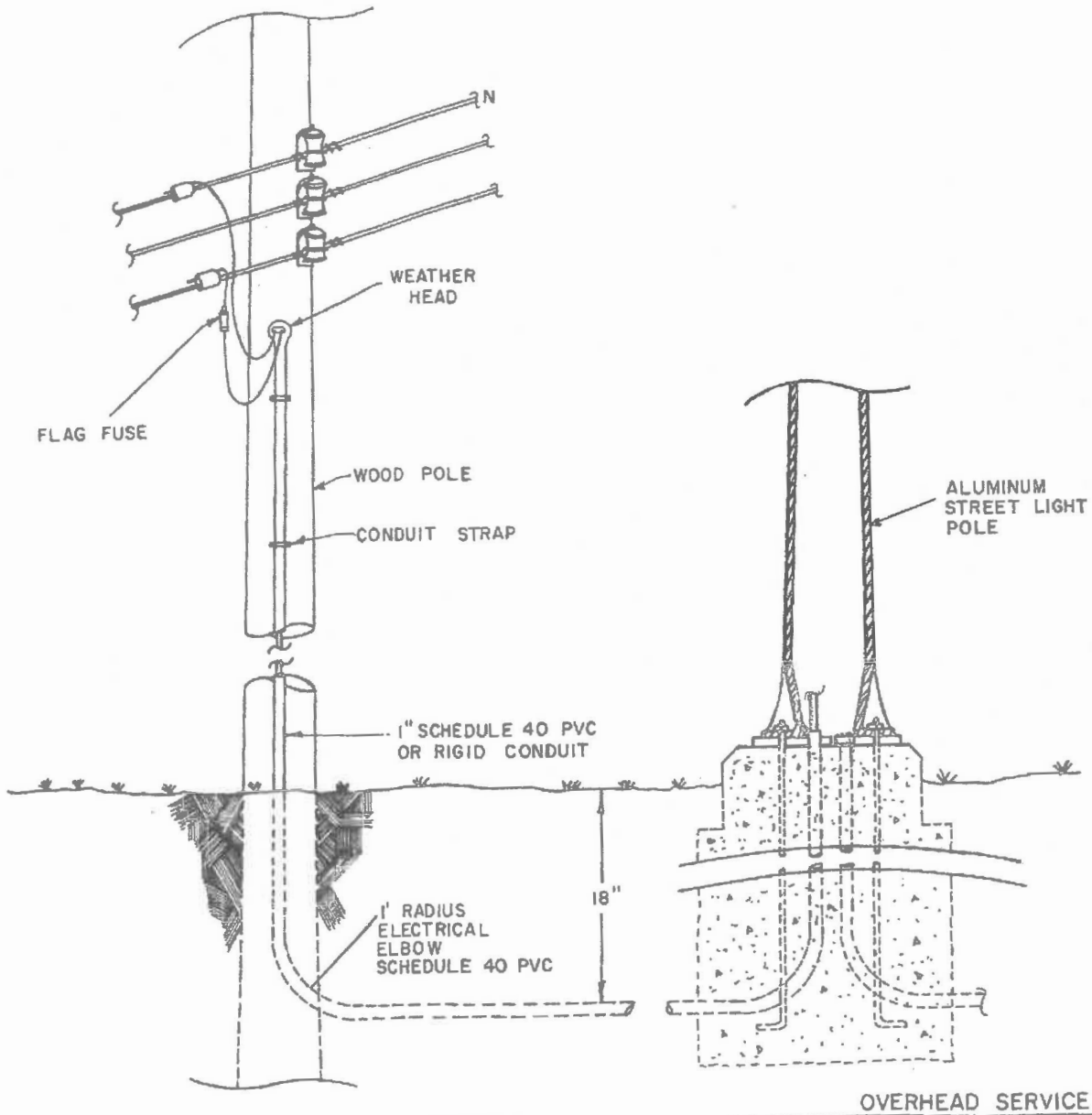
LexCall is a process for the reporting of street light outages through LFUCG's 311 call in reporting system. Daily outages are emailed to the Company and then entered into a work management system from which a repair order is generated. Relevant repair metrics are provided to LFUCG quarterly.

c. KU has a long-standing practice of tracking lighting repair activity reported by LexCall 311 that is not replicated by KU or LG&E anywhere else in the service territories. In 2020, when repairs reported by LexCall 311 could be completed by component replacement (bulb and/or photovoltaic control replacement), the Company's average street light repair took 1.10 days.

d. No.

e. No. Lighting is typically unmetered and therefore is not expected to be impacted by the proposed AMI deployment.

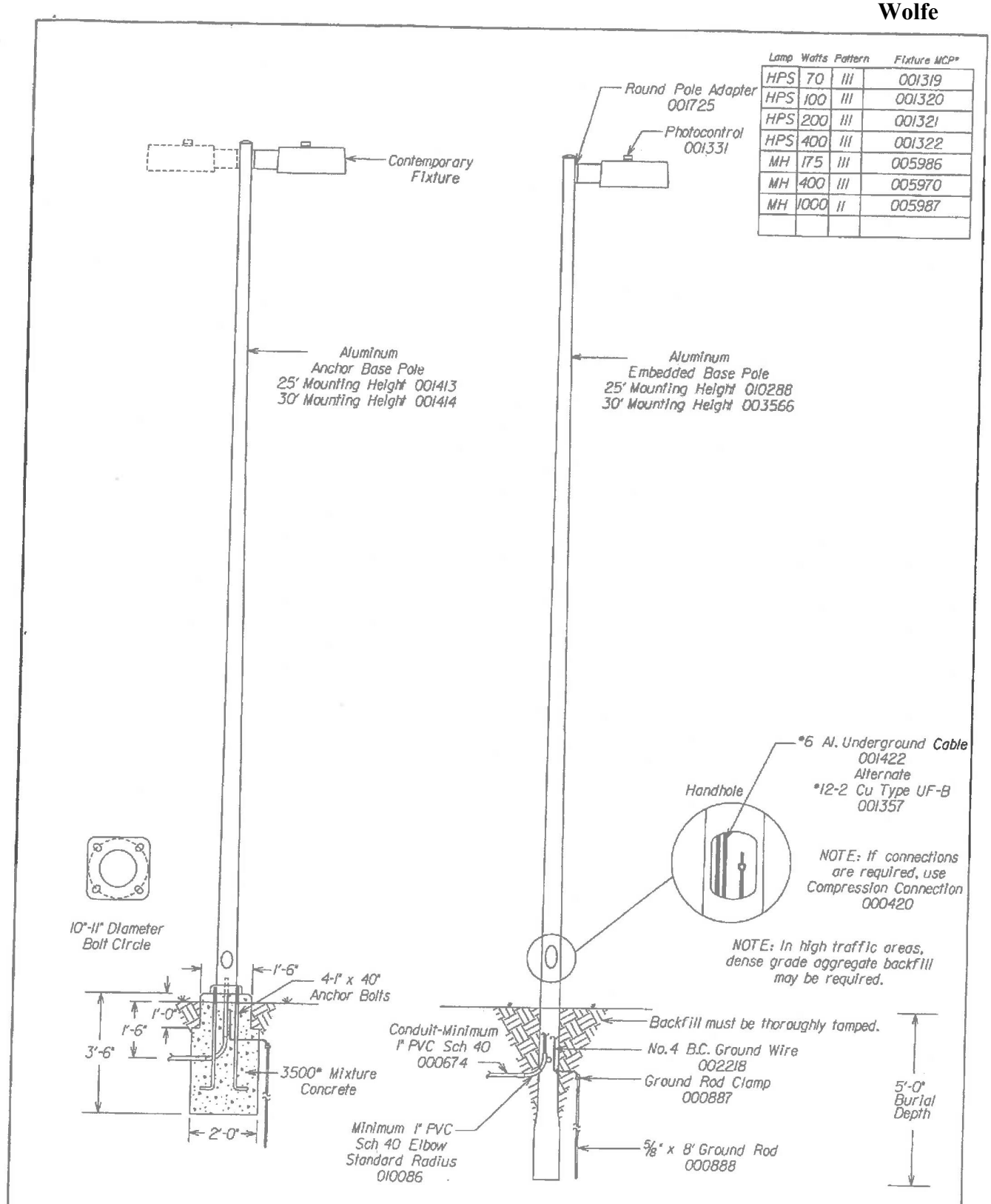

BRACKET INCLUDED WITH LUMINAIRE
PHOTO CONTROL
Drill Holes For Wire Entrance And Mounting Bolts As Required.
CONTEMPORARY LUMINAIRE
ROUND POLE ADAPTER
NOTE:
POLE AND FIXTURE TO BE BLACK IN COLOR.
#12 CU 2 CONDUCTOR CABLE TYPE UF-B OR 2 #6 AL. 1 CONDUCTOR CABLE
TOP VIEW OF
7 7/16"
10 1/2"
ANCHOR BASE
ALUMINUM POLE
COMPRESSION CONNECTOR
HANDHOLE
1" OR 1-1/4" CONDUIT WITH 1' RADIUS ELBOW AND BUSHINGS
GROUND LUG IN POLE
18"
NO. 4 B.C. GROUND WIRE
BEVEL FORMED EDGES HAND RUB CONCRETE ABOVE GROUND.
NOTE: IN PARKING LOTS, CONCRETE BASE CAN BE EXTENDED 30" ABOVE GRADE. ANCHOR BASE DEPTH SHOULD BE INCREASED TO 48".
20" MIN.
18" MIN.
42" MIN.
NOTE:
CONCRETE TO BE 3500# MIXTURE
CONDUIT AND U.G. CABLE
4-1"x36" ANCHOR BOLTS
5/8"X 8'-0" GROUND ROD
24"
UNDERGROUND SERVICE
CONSTRUCTION STANDARD - KENTUCKY UTILITIES CO. & OLD DOMINION POWER CO.
APPROVED W. E. Johnson
DATE 3-16-90
REVISED
STREET LIGHT CONSTRUCTION
ANCHOR BASE - ALUMINUM
CONTEMPORARY
SCALE
DRAWING NO.
A-9-8.02



OVERHEAD SERVICE

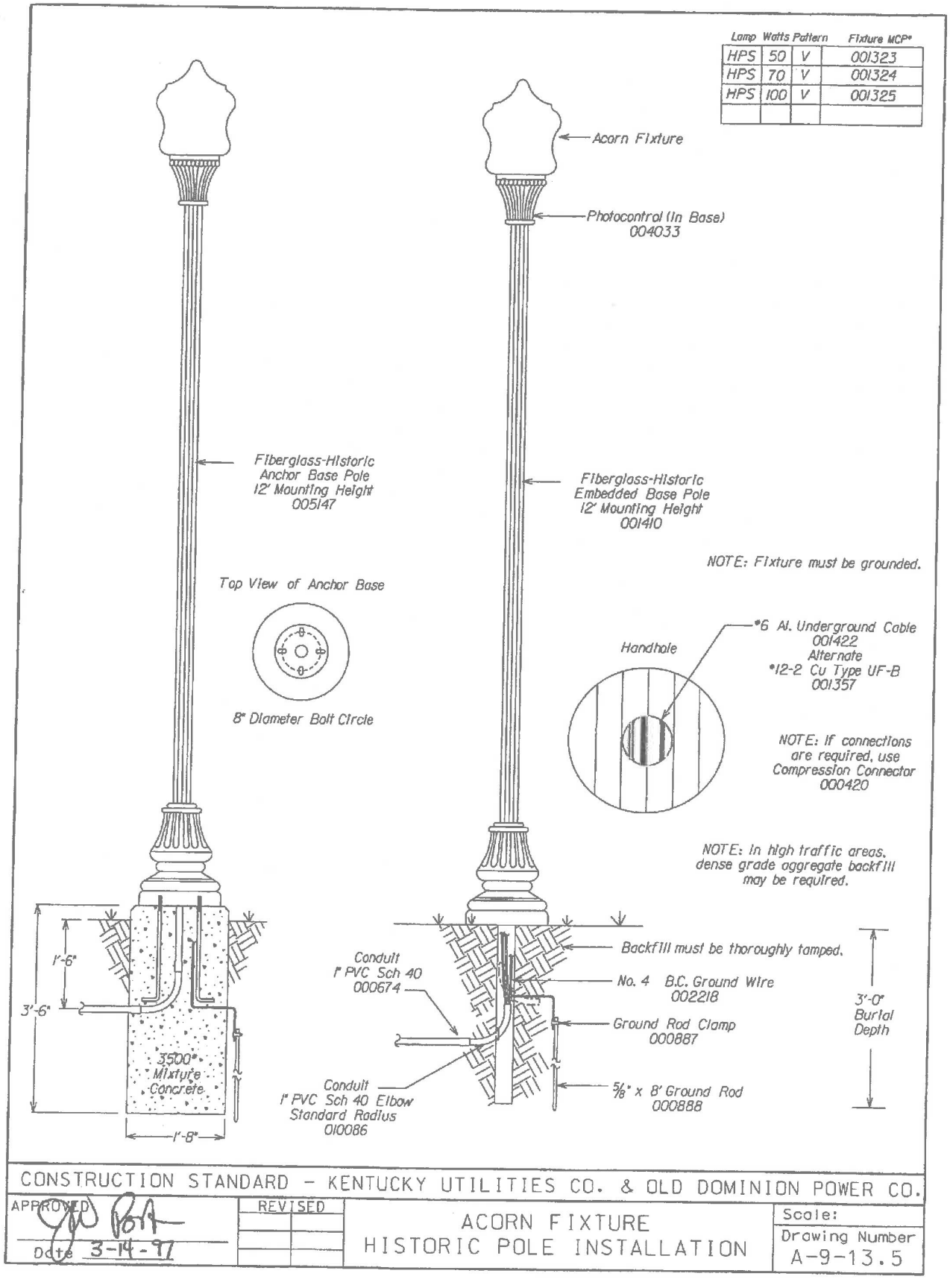
CONSTRUCTION STANDARD - KENTUCKY UTILITIES CO. & OLD DOMINION POWER CO.

APPROVED	REVISED		SCALE
W. E. Johnson		UNDERGROUND STREET/PRIVATE OUTDOOR LIGHT RISER ARRANGEMENT	
DATE 3-16-90			DRAWING NO. A-9-8.15



CONSTRUCTION STANDARD – KENTUCKY UTILITIES CO. & OLD DOMINION POWER CO.

APPROVED	REVISED		Scale:
Date 10-17-96	8/26/96	CONTEMPORARY FIXTURE ORNAMENTAL POLE INSTALLATION	Drawing Number A-9-12.0


Lamp Watts Pattern Fixture MCP*
HPS 50 V 001323
HPS 70 V 001324
HPS 100 V 001325
Acorn Fixture
Photocontrol (In Base) 004033
Fiberglass-Historic Anchor Base Pole 12' Mounting Height 005147
Fiberglass-Historic Embedded Base Pole 12' Mounting Height 001410
NOTE: Fixture must be grounded.
Top View of Anchor Base
8" Diameter Bolt Circle
Handhole
*6 Al. Underground Cable 001422 Alternate *12-2 Cu Type UF-B 001357
NOTE: If connections are required, use Compression Connector 000420
NOTE: In high traffic areas, dense grade aggregate backfill may be required.
1'-6"
3'-6"
3500* Mixture Concrete
1'-8"
Conduit 1" PVC Sch 40 000674
Conduit 1" PVC Sch 40 Elbow Standard Radius 010086
Backfill must be thoroughly tamped.
No. 4 B.C. Ground Wire 002218
Ground Rod Clamp 000887
5/8" x 8' Ground Rod 000888
3'-0" Burial Depth
CONSTRUCTION STANDARD - KENTUCKY UTILITIES CO. & OLD DOMINION POWER CO.
APPROVED
Date 3-14-97
REVISED
ACORN FIXTURE
HISTORIC POLE INSTALLATION
Scale:
Drawing Number
A-9-13.5

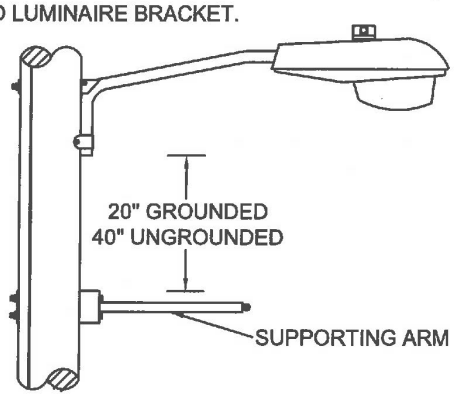
Electric System Codes & Standards

NESC MINIMUM CLEARANCE REQUIREMENTS FROM STREETLIGHTS TO COMMUNICATION FACILITIES

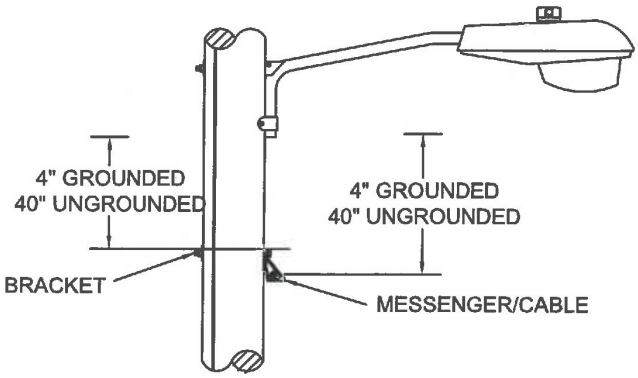
02 10 12
Rev. A

NESC SECTION 238 REQUIREMENTS (NESC 2017)

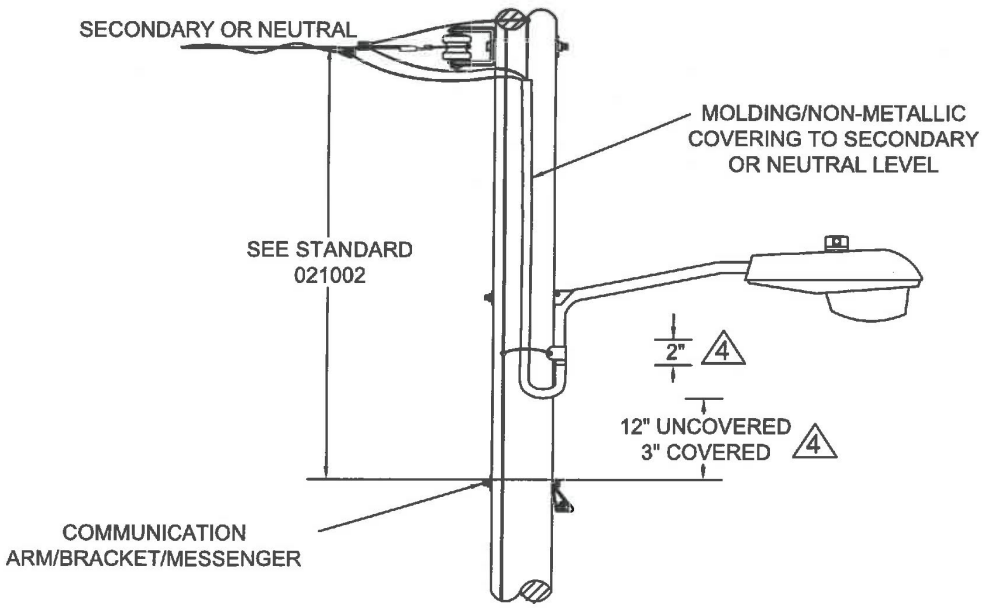
NOTE:
1. ALL NEW STREET LIGHT FIXTURES MUST BE EFFECTIVELY GROUNDED. IF UNABLE TO VERIFY GROUND, EITHER USE UNGROUNDED CLEARANCES OR FIXTURE MUST BE GROUNDED.
2. 40" MIN. CLEARANCE MUST BE MET BETWEEN NEUTRAL AND SECONDARY CABLE HARDWARE AND COMMUNICATIONS EQUIPMENT.
3. THE 12" AND 3" CLEARANCE ONLY APPLIES TO THE DRIP LOOP FEEDING THE LUMINAIRE.
4. THE REDUCED 3" CLEARANCE MAY BE USED IF NON-METALLIC COVERING IS PROVIDED AND EXTENDS 2" INTO LUMINAIRE BRACKET.



CLEARANCE FROM LUMINAIRE BRACKET TO TOP OF COMMUNICATION SUPPORTING ARM



CLEARANCE FROM LUMINAIRE BRACKET TO TOP OF COMMUNICATION BRACKET OR CABLE/MESSENGER MOUNTED TO POLE (BOTH REQUIREMENTS APPLY)



CLEARANCE FROM DRIP LOOP TO TOP OF COMMUNICATION ARM/BRACKET/MESSENGER

Electric System
Codes & Standards

FLOOD LIGHT INSTALLATION

80 04 02
Rev. C

ASSEMBLY DESCRIPTION
80 04 02 . XX

800402 . 01 SINGLE FLOOD LIGHT MOUNTING
800402 . 02 DOUBLE FLOOD LIGHT MOUNTING

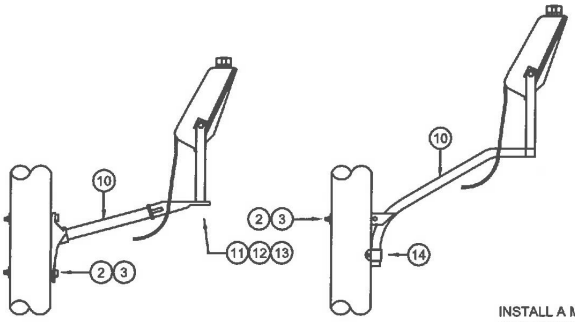
NOTE:
1. ALL COPPER CONNECTIONS ARE TO BE MADE USING SPLIT BOLT CONNECTORS.
2. ALL ALUMINUM TO ALUMINUM OR ALUMINUM TO COPPER CONNECTIONS ARE TO BE MADE USING COMPRESSION CONNECTORS.
3. HOT LEG - SPLIT BOLT CONNECTOR TO BE WRAPPED WITH 600V ELECTRICAL TAPE IN DETAIL A AND C.
4. CONNECT GREEN WIRE OF LAMP CORDS TO POLE GROUND AT END OF CORDS. DO NOT SPLICE TO #12 2/C W/GND IF USED.
5. SEE STANDARD 800000 FOR LIGHT FIXTURES, LAMPS AND PHOTO CELLS.

80 04 02 . XX – MATERIAL LIST

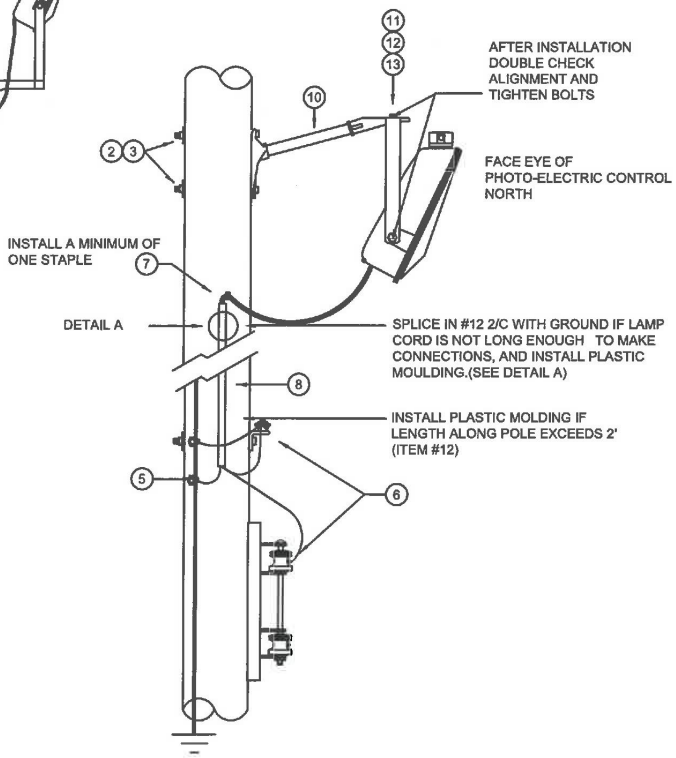
ITEM	IIN	DESCRIPTION	01	02
1	1185901	BRACKET,FLOODLIGHT,DOUBLE-UP OR DOUBLE DOWN,AL		
2	VARIES	5/8" MACHINE BOLT W/NUT		
3	7000337	WASHER,FLAT,SQUARE,2-1/4" X 2-1/4" X 3/16",FOR 5/8" BOLT		
4	7005817	CONDUCTOR,OH WIRE,4,CU,BARE,SD,SOLID		
5	1200378	CONNECTOR,SPLIT BOLT,6 SLD,CU		
6	VARIES	VARIOUS SMALL CONNECTORS		
7	7002252	STAPLE,MOULDING,ROLLED POINT,FOR 1/2" MOULDING,STL		
8	7000913	MOULDING,GROUND,1/2"X 8F,PLASTIC		
9	7001357 OR	CABLE,600V,#12,SOLID,2/C W/GROUND		
	7006487	CABLE,600V/UG,#6-#6,2/C AAC DUPLEX,XLP		
10	7001703 OR	BRACKET,INSULATOR/ARRESTER,18",SINGLE		
	7001368	BRACKET,LIGHTING,DIRECTIONAL FIXTURE,GALVANIZED OR AL		
11	7010445	BOLT,MACH,SQ HD,3/4" X 2-1/2",GALV,W/SQ NUT		
12	7000349	WASHER,SPLIT LOCK,.234 X .188 FOR 3/4" BOLT,GALV STL		
13	7010442	WASHER,FLAT,SQUARE,3" X 3" X 3/16",FOR 3/4" BOLT,GALV STL.		
14	7003001	SCREW,LAG,TWIST DRIVE, TEST POINT,1/2"X4-1/2"		

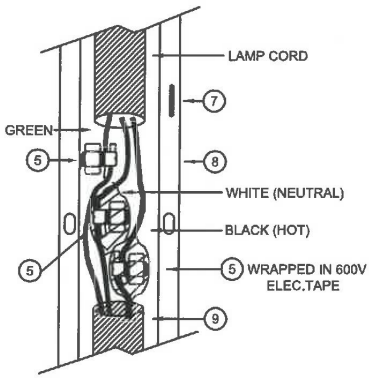
* AS REQUIRED

SINGLE UP POSITION SHOWN



SINGLE DOWN POSITION SHOWN





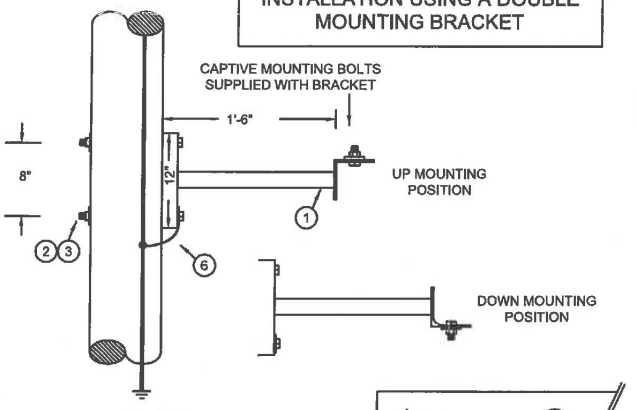
DETAIL A
(SPLICE DETAIL IF REQUIRED)

Electric System
Codes & Standards

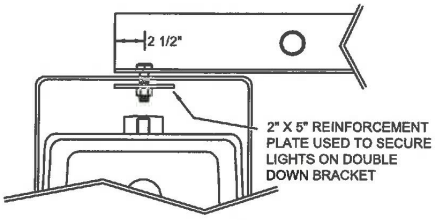
FLOOD LIGHT INSTALLATION

80 04 02
Rev. C

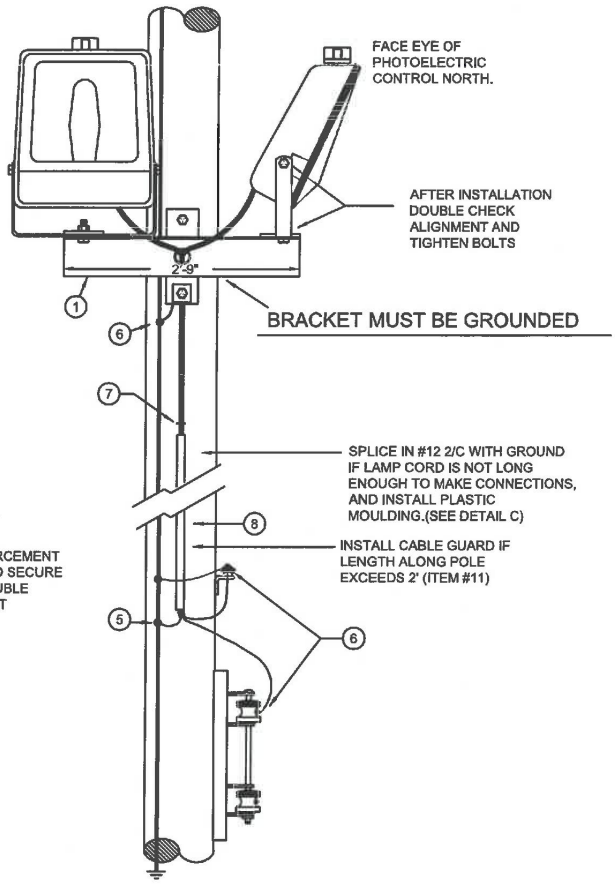
DOUBLE UP FLOOD LIGHT INSTALLATION USING A DOUBLE MOUNTING BRACKET

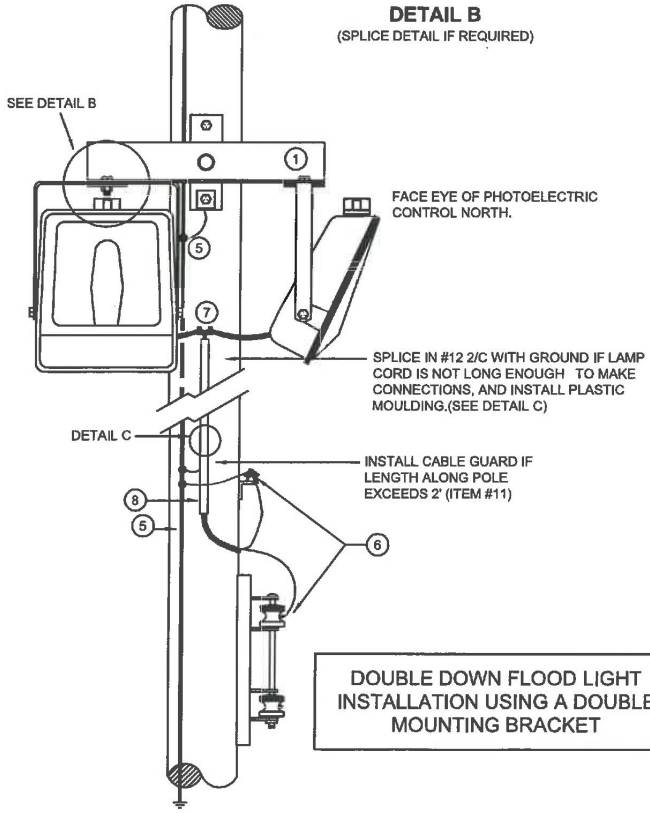


BRACKET MOUNTING DETAIL

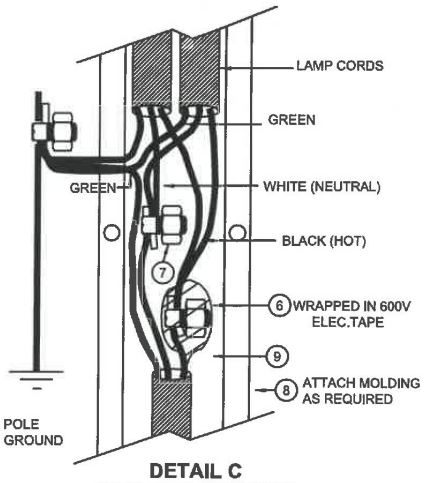


DETAIL B
(SPLICE DETAIL IF REQUIRED)





DOUBLE DOWN FLOOD LIGHT INSTALLATION USING A DOUBLE MOUNTING BRACKET



DETAIL C
(SPLICE DETAIL IF REQUIRED)
SEE NOTE #4 ON PAGE #1

Electric System
Codes & Standards

MAST ARM INSTALLATION FOR COBRA AND OPEN BOTTOMS ON WOOD POLES

80 06 20
Rev. C

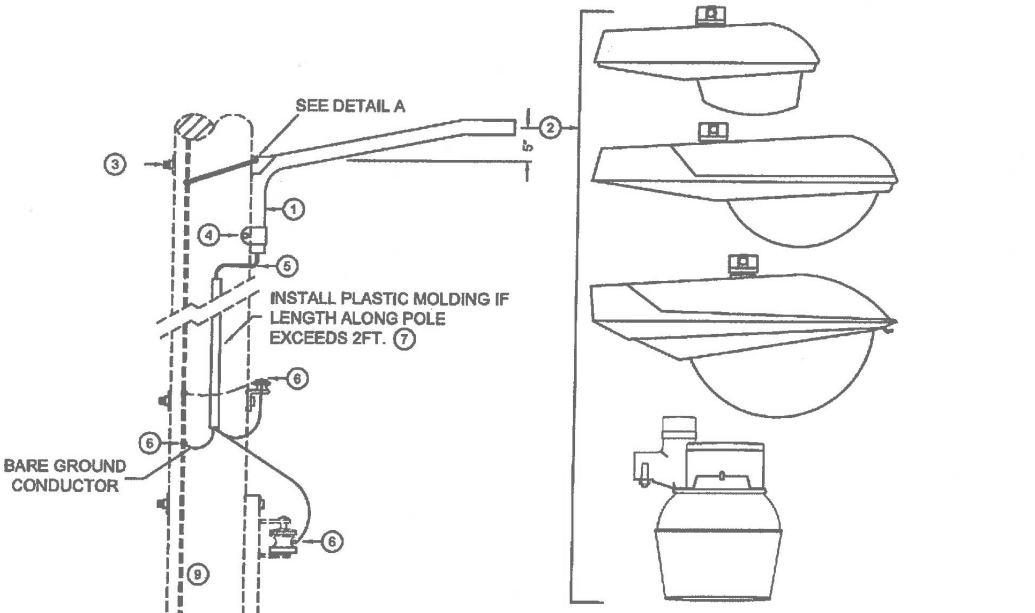
ASSEMBLY DESCRIPTION
80 06 20 . XX

ASSEMBLY DETAILING 2', 6', AND 10'
MAST ARM INSTALLATION ON WOOD POLES.
80 06 20. 01 LUMINAIRE ASSEMBLY ON 2' MAST ARM
80 06 20. 02 LUMINAIRE ASSEMBLY ON 6' MAST ARM
80 06 20. 03 LUMINAIRE ASSEMBLY ON 10' MAST ARM

NOTE:
1. SECONDARIES SHOWN FOR EXAMPLE PURPOSE ONLY. ACTUAL CONNECTIONS MAY BE 120V OR 240V DEPENDING ON JOB REQUIREMENTS.
2. REFER TO 021012 FOR PROPER SPACING REQUIREMENTS.

MATERIAL LIST

ITEM	IIN	DESCRIPTION	01	02	03
1	VARIES	MAST ARM, ALUM - SEE STD 800202	1	1	1
2	VARIES	LAMP/LUMINAIRE - SEE STD 800000	1	1	1
3	VARIES	5/8" MACHINE BOLT W/NUT	1	1	1
4	1159243	SCREW,LAG,1/2"X 4",GIMLET POINT,GALV	2	2	4
5	7001357 OR	CABLE,600V,#12,SOLID,2/C W/GROUND,TYPE UF-B,OH & UG	*	*	*
	7000414	CABLE,OH,DUPLEX,#4 AL W/#4 ACSR NEUTRAL,XLP,TERRIER,500' COIL			
6	VARIES	VARIOUS SMALL CONNECTORS	4	4	4
7	7000913	MOULDING,GROUND,1/2"X 8F,PLASTIC	*	*	*
8	7000337	WASHER,FLAT,SQUARE,2-1/4" X 2-1/4" X 3/16",FOR 5/8" BOLT,GALV STL	1	1	1
9	7005817	CONDUCTOR,OH WIRE,4,CU,BARE,SD,SOLID	*	*	*



DETAIL A
MAST ARM GROUNDING LUG PROVIDED WITH ARM.

DETAIL B
LUMINAIRE MOUNTING AND TERMINATION DETAIL

LG&E KU

Electric Design And Construction Standards

Replaces
LGE 80 06 20 B
KU A-9-6.0

By: Hethcox/Jordan
09/11/18
Page 1 of 1

Electric System Codes & Standards

YARD TYPE / PACKAGE LIGHT WOOD POLE INSTALLATION

80 06 22
Rev. A

Grounding notes:
All existing and new fixtures and mast arms must be grounded unless grounding negatively impacts safety or the reliability of the structure. Grounding of both the fixture and the mast arm can be accomplished by grounding either the fixture, the mast arm or both. In general a visible external ground is preferred.

Internal grounding can be accomplished by attaching a separate ground wire of a 3-wire cable (i.e. 12-2/C w/ground) between the pole ground and ground lug in the fixture.

For external grounding, the pole ground wire is fastened to mast arm with 3/8" x 1-1/4" carriage bolt, nut and lock washer (IIN #3003808) using a minimum of #6 bare SD Cu. Older installations with no grounding provisions can be grounded by drilling the support and using a self tapping screw and washer.

MATERIAL LIST

ITEM	IIN NUMB.	DESCRIPTION	QTY.
1	VARIES	SEE STANDARD 800000 FOR LAMP	1
2	7000258	BOLT,MACHINE,SQ HD,5/8"X 10",GALV,W/SQ NUT	1
3	7000911	BRACKET,WIRE,1-INSULATOR,LESS INSULATOR,4" X 3-1/4"	1
4	7001268	INSULATOR,SECONDARY,SPOOL 3",PORCELAIN OR POLYETHYLENE	1
5	7002215	CLAMP,WEDGE,SERVICE,#2- #6 ACSR,RIGID SS BAIL	*
6	7000339	WASHER,CURVED,SQUARE,3" X3" X 1/4",GALV,FOR 5/8" BOLT	1
7	VARIES	VARIOUS SMALL CONNECTOR	*
8	7000913	MOULDING,GROUND,1/2"X 8F,PLASTIC	*
9	7001357 OR	CABLE,600V,#12,SOLID,2/C W/GROUND,TYPE UF-B,OH & UG	*
	7000414	CABLE,OH,DUPLEX,#4 AL W/#4 ACSR NEUTRAL,XLP,TERRIER,500' COIL	
10	7005817	CONDUCTOR,OH WIRE,4,CU,BARE,SD,SOLID,25 LB. SPOOL	*
11	7002252	STAPLE,MOULDING,ROLLED POINT,FOR 1/2" MOULDING,STL	*

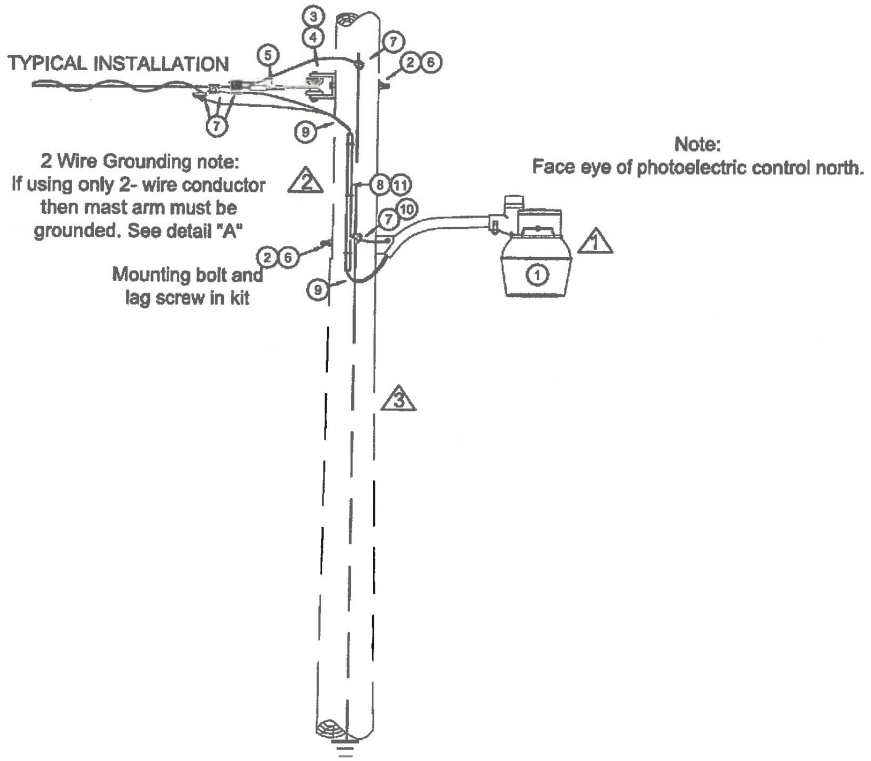
* AS REQUIRED

NOTES:

1. Package light kit includes, head, optics, lamp, photo control, 2/wire - pre-wired cable, mast arm, 5/8" mounting bolt & lag screws and grounding bolt. *LED FIXTURES CAN BE USED WITHOUT REFRACTOR.

2. Install cable guard 1/2", ground wire molding (IIN 7000913) if length along pole exceeds 2 ft. Vertical riser must be covered with cable guard even if jacketed conductor cable is used. If 3-#6al. poly is used you may use 1"x 10' cable guard U shaped PVC IIN # 1160501.

3. Pole and pole grounding not included in this standard.



Electric System
Codes & Standards

STREET LIGHT CONSTRUCTION ANCHOR BASE - OVERHEAD 80 06 24
COBRA HEAD

Rev.

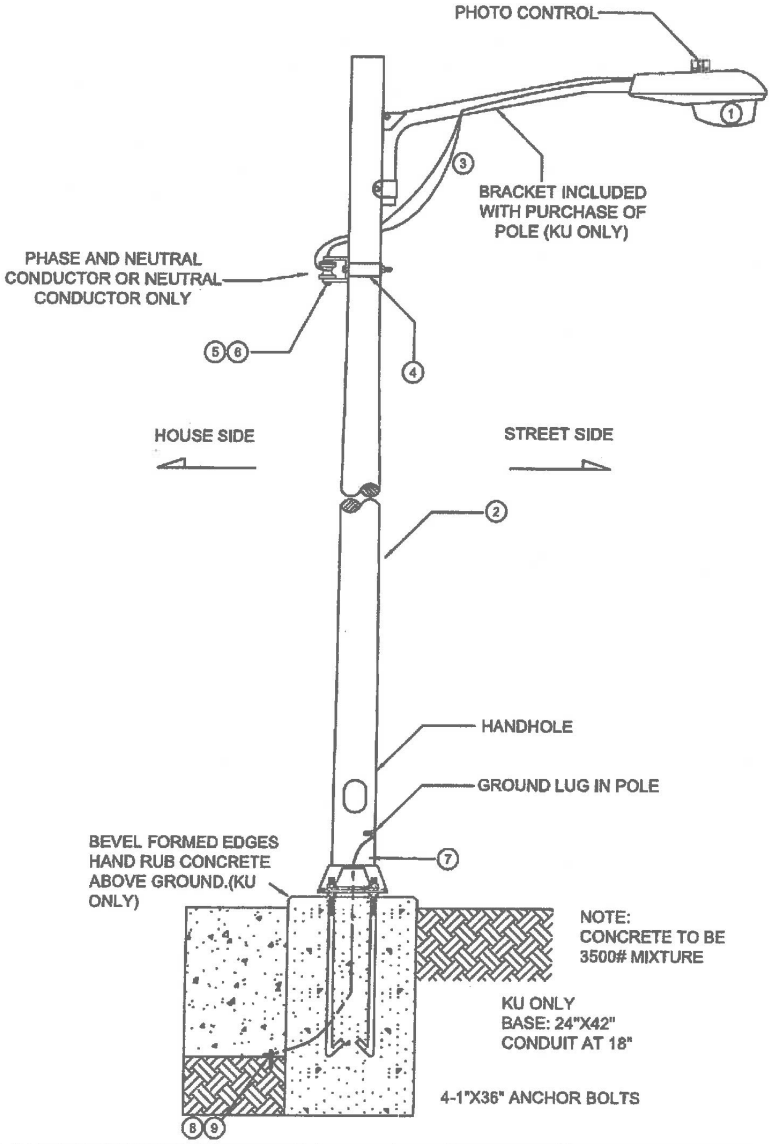
NOTE:
POLE WITH OH SERVICE - NOT CONSIDERED BREAKAWAY

MATERIAL LIST

ITEM	SN	DESCRIPTION	QT
1	VARIES	LAMP - SEE STD 800000	1
2	VARIES	POLE - SEE STD 800002	1
3	7000414	CABLE,OH,DUPLEX,#4 AL W/#4 ACSR NEUTRAL,XLP,TERRIER,500' COIL	*
4	7000836	BAND,POLE,4 WAY,SMALL,GALV STL	1
5	7000911	BRACKET,WIRE,1-INSULATOR,LESS INSULATOR,4" X 3-1/4"	1
6	7001268	INSULATOR,SECONDARY,SPOOL 3"	1
7	7005817	CONDUCTOR,OH WIRE,4,CU,BARE,SD,SOLID,25 LB. SPOOL	*
8	7000888	ROD,GROUND,5/8"X8',BONDED COPPER	1
9	7000887	CLAMP,GROUND ROD,5/8",8-1/0,HEX,CU,HEAVY DUTY	1

* AS REQUIRED

SEE 80 08 04
FOR KY DOT
COMPLIANT FOUNDATION



LG&E KU

Electric Design And Construction Standards

Replaces
LGE None
KU A-9-7.0

By: Hethcox/Jordan
09/11/2018
Page 1 of 1

Electric System
Codes & Standards

POLES USED WITH POST TOP MOUNT LUMINAIRES

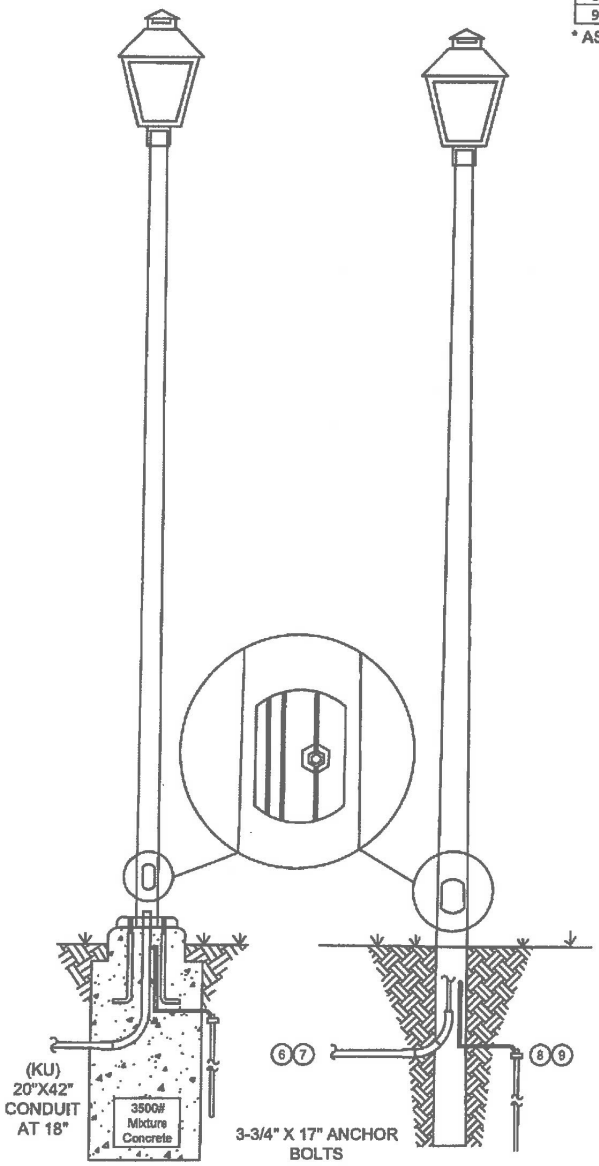
80 08 20
Rev. C

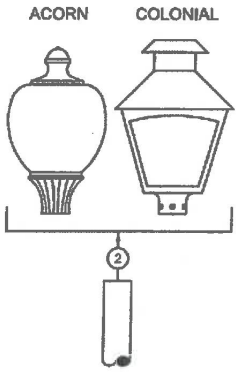
NOTE:
1. PROPER LAMP/LUMINAIRE COMBINATION AND ASSOCIATED EQUIPMENT MUST BE ADDED TO MATERIAL LIST. SEE STANDARD 800000.
2. NEUTRAL CONNECTION IS MADE WITH SPLIT BOLT CONNECTOR ONLY - NO TAPING IS REQUIRED.
3. SEE OPPOSITE PAGE FOR FOUNDATION DETAIL.
4. SPLICING MATERIAL IS INCLUDED IN THIS STANDARD IF NOT NEEDED OMIT FROM MATERIAL LIST.
5. SEE 800002 FOR SETTING OR EMBED DEPTH.

MATERIAL LIST

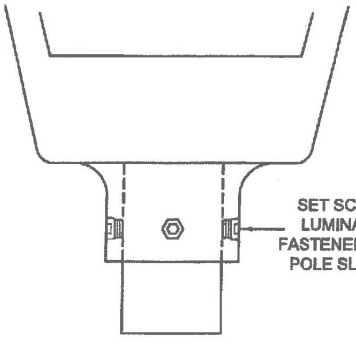
ITEM	IIN NUMB.	DESCRIPTION	QT
1	VARIES	POLE - SEE STD. 800002	1
2	7001357 OR	CABLE,600V,#12,SOLID,2/C W/GROUND,TYPE UF-B,OH & UG	20
	7000414	CABLE,OH,DUPLEX,#4 AL W/#4 ACSR NEUTRAL,XLP,TERRIER	
3	VARIES	CONNECTOR, SPLIT BOLT	2
4	1164401	TAPE,ELECTRICAL,VINYL,3/4" X 8.5 MIL X 66',BLACK,ALL WEATHER	1
5	1164435	TAPE,NON FUSING RUBBER,3/4"X 30 MIL X 30',EPR	1
6	7000674 OR	CONDUIT,PVC,1"X10',SCH 40,LONG BELL END	*
	7006682	CONDUIT,PVC,2"X20',SCH 40,LONG BELL END	
7	7010086 OR	ELBOW,CONDUIT,PVC,1"XSTD(5-3/4"),SCH 40,90 DEG,DEEP SOCKET	1
	7001206	ELBOW,CONDUIT,PVC,2"X24",SCH 40,90 DEG,DEEP SOCKET	
8	7000888	ROD,GROUND,5/8"X8',BONDED COPPER	1
9	7000887	CLAMP,GROUND ROD,5/8",8-1/0,HEX,CU,HEAVY DUTY	1

* AS REQUIRED

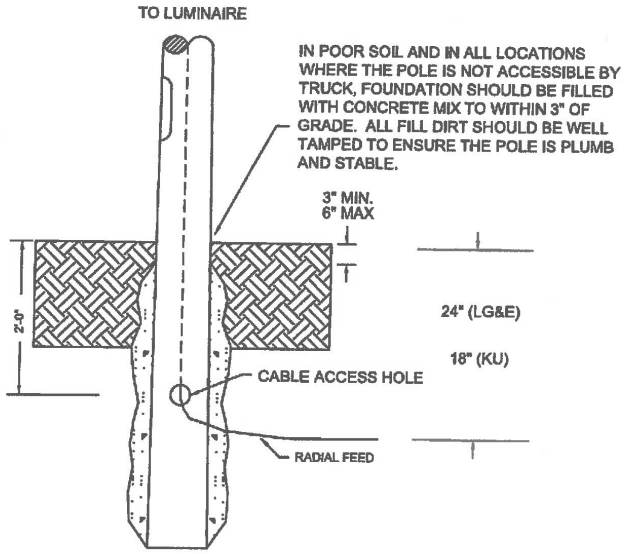




AVAILABLE POST TOP
LUMINAIRES - SEE STD 800800
ALL LUMINAIRES ARE 120V
UNLESS OTHERWISE NOTED



TYPICAL LUMINAIRE
ATTACHMENT DETAIL



FOUNDATION DETAIL FOR POOR SOIL OR NON BUCKET TRUCK ACCESSIBLE LOCATIONS

Electric System
Codes & Standards

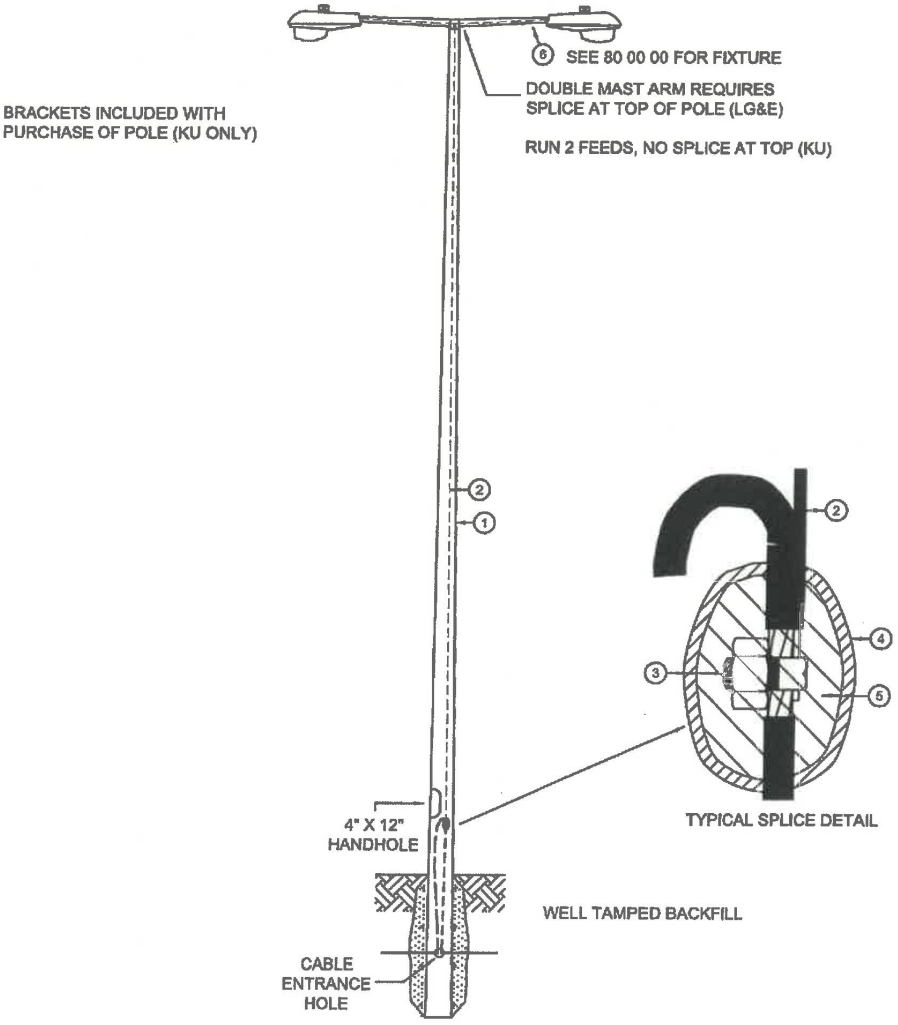
INSTALLATION OF DIRECT BURIED ALUMINUM POLES WITH MAST ARMS - UNDERGROUND SERVICE

80 08 21
Rev. E

NOTE:
1. PROPER LAMP/LUMINAIRE COMBINATION AND ASSOCIATED EQUIPMENT MUST BE ADDED TO MATERIAL LIST. SEE STANDARD 80 00 00.
2. SEE OPPOSITE PAGE FOR FOUNDATION AND ARM MOUNTING DETAILS.
3. SPLICING MATERIAL IS INCLUDED IN THIS STANDARD. IF NOT NEED OMIT FROM MATERIAL LIST.
4. MAKE SURE THAT BARE GROUND CONDUCTOR IS BONDED TO THE GROUND STUD OF EACH LUMINAIRE HEAD.

MATERIAL LIST

ITEM	UN	DESCRIPTION	01
1	VARIES	POLE - SEE STD 80 00 02	1
2	7001357	CABLE,600V,#12,SOLID,2/C W/GROUND	40
3	VARIES	SPLIT BOLT CONNECTOR	3
4	1164401	TAPE,ELECTRICAL,VINYL,3/4" X 8.5 MIL X 66',BLACK	1
5	1164435	TAPE,NON FUSING RUBBER,3/4"X 30 MIL X 30',EPR	1
6	VARIES	ARM/MAST - SEE STD 80 02 02	1
7	7010086 OR	ELBOW,CONDUIT,PVC,1"XSTD(5-3/4")	1
	7001206	ELBOW,CONDUIT,PVC,2"X24"	
8	7000674 OR	CONDUIT,PVC,1"X10',SCH 40,LONG BELL END	1
	7006682	CONDUIT,PVC,2"X20',SCH 40, LONG BELL END	
9	7000888	ROD,GROUND,5/8"X8',BONDED COPPER	1
10	7000887	CLAMP,GROUND ROD,5/8",8-1/0,HEX,CU,HEAVY DUTY	1

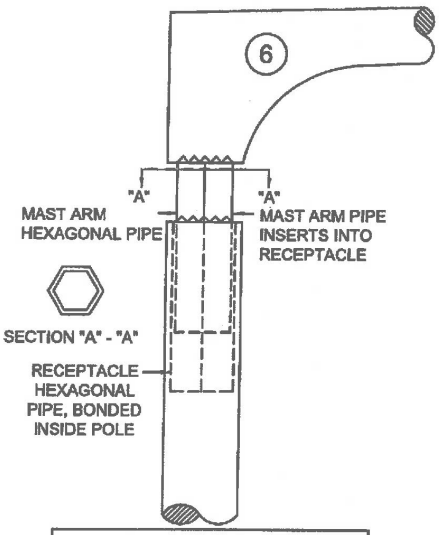


INSTALLATION FOR NORMAL SOIL CONDITIONS

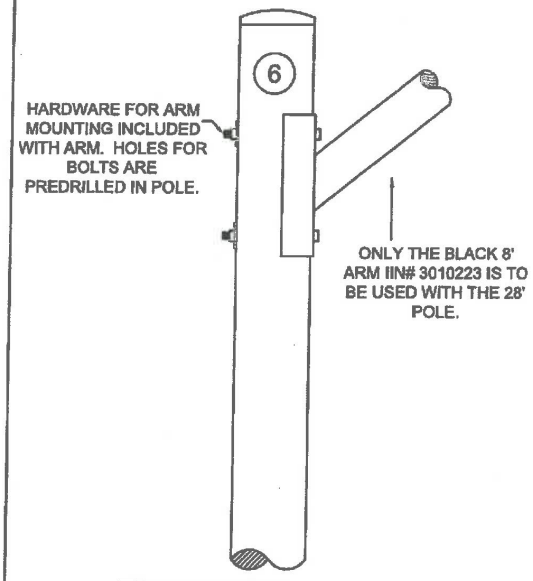
Electric System Codes & Standards

INSTALLATION OF DIRECT BURIED ALUMINUM POLES WITH MAST ARMS - UNDERGROUND SERVICE

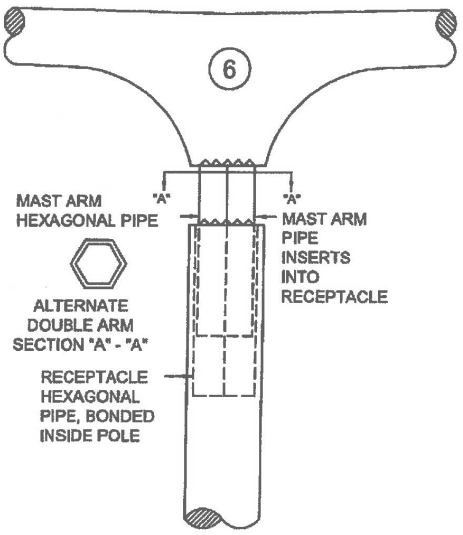
80 08 21
Rev. E



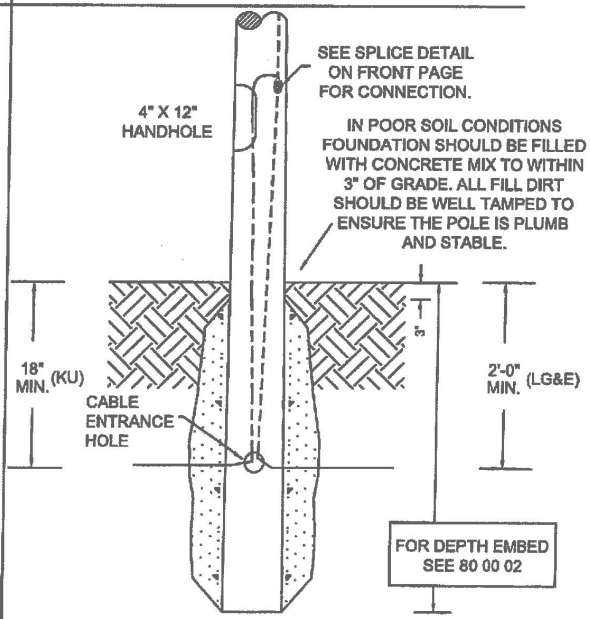
DETAIL "A" SINGLE ARM ATTACHMENT 80 08 21 . XX 01



DETAIL "B" ARM ATTACHMENT FOR 28' MTH BLACK POLE 80 08 21 . 01 01 ONLY



80 08 21 . XX 02
DOUBLE ARM ATTACHMENT



FOUNDATION DETAIL FOR POOR SOIL CONDITIONS

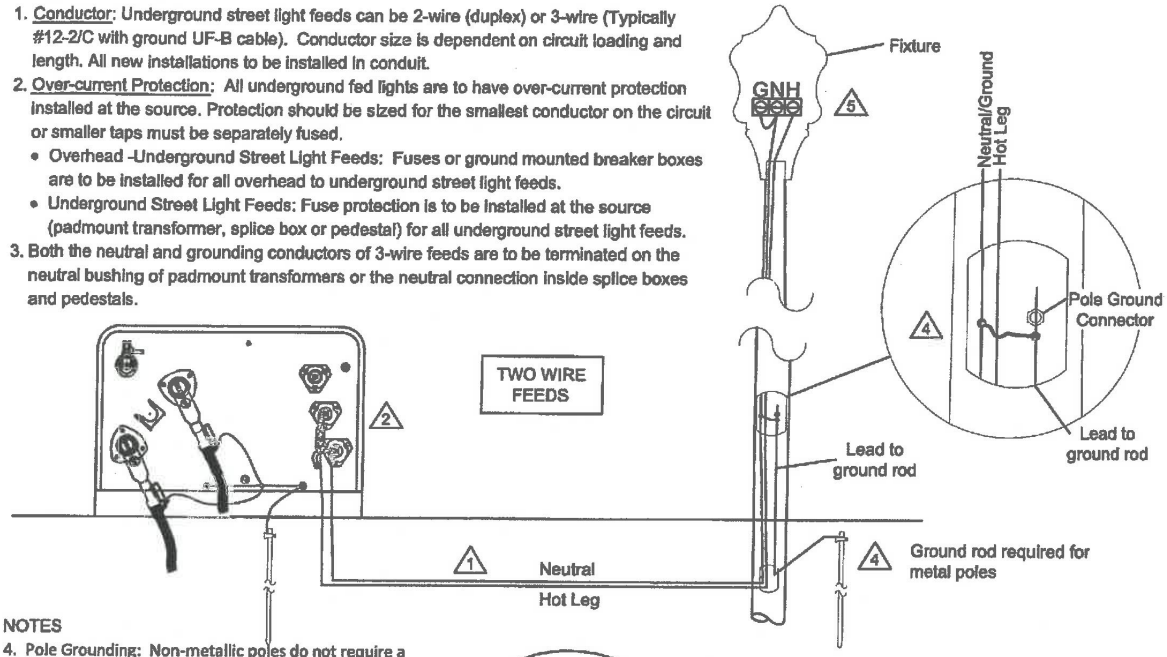
Electric System Codes & Standards

GENERAL REQUIREMENTS FOR WIRING AND GROUNDING SINGLE PHASE UNDERGROUND FED STREET LIGHT POLES

80 08 25
Rev. A

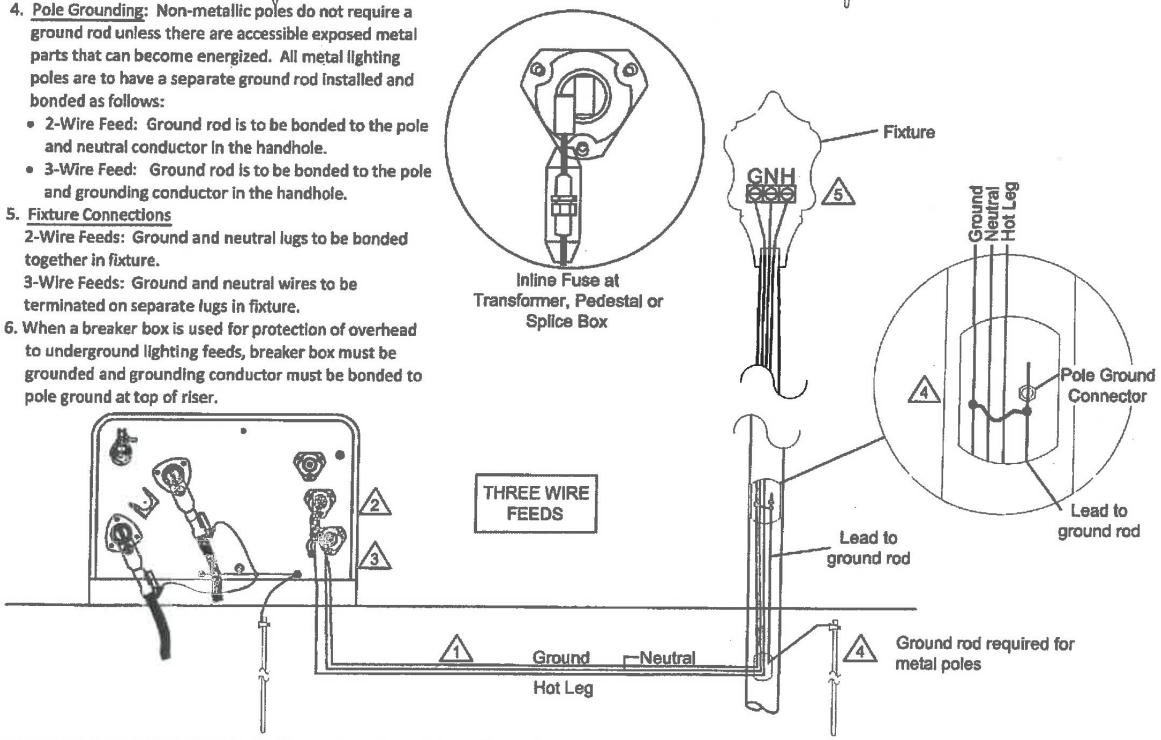
NOTES

1. Conductor: Underground street light feeds can be 2-wire (duplex) or 3-wire (Typically #12-2/C with ground UF-B cable). Conductor size is dependent on circuit loading and length. All new installations to be installed in conduit.
2. Over-current Protection: All underground fed lights are to have over-current protection installed at the source. Protection should be sized for the smallest conductor on the circuit or smaller taps must be separately fused.
   - Overhead -Underground Street Light Feeds: Fuses or ground mounted breaker boxes are to be installed for all overhead to underground street light feeds.
   - Underground Street Light Feeds: Fuse protection is to be installed at the source (padmount transformer, splice box or pedestal) for all underground street light feeds.
3. Both the neutral and grounding conductors of 3-wire feeds are to be terminated on the neutral bushing of padmount transformers or the neutral connection inside splice boxes and pedestals.



NOTES

4. Pole Grounding: Non-metallic poles do not require a ground rod unless there are accessible exposed metal parts that can become energized. All metal lighting poles are to have a separate ground rod installed and bonded as follows:
   - 2-Wire Feed: Ground rod is to be bonded to the pole and neutral conductor in the handhole.
   - 3-Wire Feed: Ground rod is to be bonded to the pole and grounding conductor in the handhole.
5. Fixture Connections
   2-Wire Feeds: Ground and neutral lugs to be bonded together in fixture.
   3-Wire Feeds: Ground and neutral wires to be terminated on separate lugs in fixture.
6. When a breaker box is used for protection of overhead to underground lighting feeds, breaker box must be grounded and grounding conductor must be bonded to pole ground at top of riser.



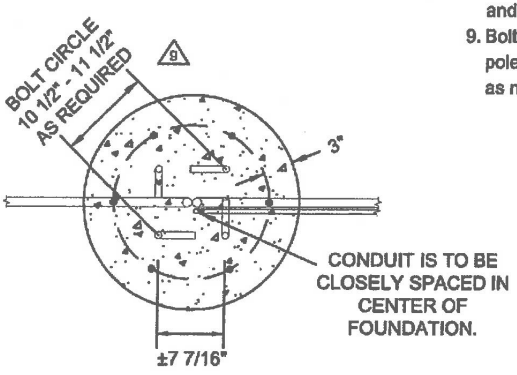
Electric System Codes & Standards

SPECIAL KY DOT COMPLIANT FOUNDATION FOR BREAKAWAY POLES UP TO 35' WITH MAXIMUM 15' ARM

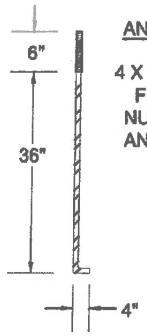
80 08 40 Rev.

Notes

1. Precast foundations are not allowed.
2. Ground rod and #4 copper or copper weld ground wire installed by contractor with foundation. A minimum of 24" of ground wire to be exposed above top of conduit.
3. Foundation depth and below ground dimensions are minimums. Where rock is encountered, foundation requires a minimum 2'-0" rock embedment not to exceed an overall depth of 5'-0". Minimum foundation depth with 2'-0" rock embedment is 3'-6" (for anchor bolts).
4. Foundation to extend above ground approximately 1" with chamfered edge. Top of foundation to be finished smooth and level with rebar and anchor bolts perpendicular to top of foundation. 3" minimum to be provided between rebar and any edge of foundation
5. Concrete mix to be a minimum 3,500 PSI strength and a 4" to 6" slump and placed in a dry hole.
6. Foundation to be oriented for light positioned between anchor bolts
7. Foundation designed to meet AASHTO 2009 requirements and is acceptable for most soil conditions.
8. Conduit to be Schedule 40 minimum with number, size and orientation to be specified by utility.
9. Bolt pattern shown is for 10 1/2" diameter bolt circle. For poles with larger diameter bolt circles installer may adjust as necessary.

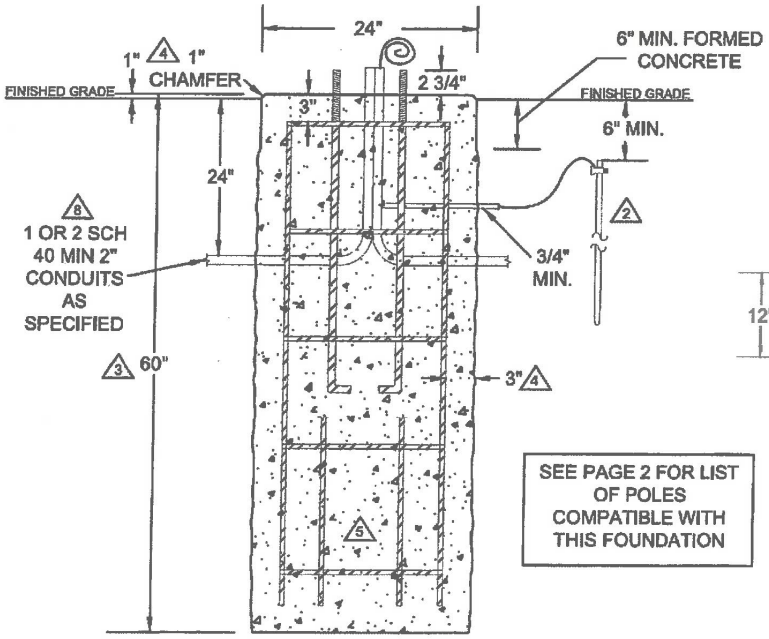


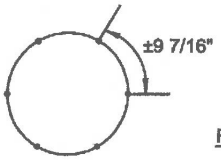
TYPICAL ANCHOR BOLT DETAIL



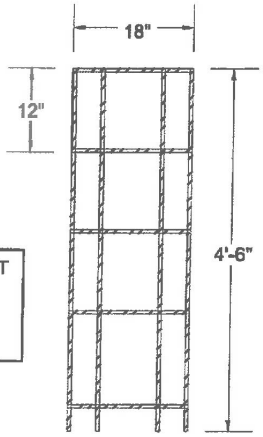
4 X 1" ANCHOR BOLTS FURNISHED WITH NUT, FLAT WASHER AND LOCK WASHER

FOUNDATION DETAIL





REBAR CAGE DETAIL



6 #5 VERTICAL BARS EQUALLY SPACED #3 BAR TIES 12" ON CENTER OR SPACED AT 12" PITCH

SEE PAGE 2 FOR LIST OF POLES COMPATIBLE WITH THIS FOUNDATION

LG&E KU

Electric Design And Construction Standards

Replaces
LGE None
KU None

By: Hethcox/Leake
10/04/12
Page 1 of 2

Aluminum BREAKAWAY Poles That Fit KYDOT Foundation

Note: Only breakaway poles allowed in KYDOT controlled areas.

IIN	DESCRIPTION	MOUNTING HEIGHT	ARM	BOLT CIRCLE
7010305	POLE,ALUM,30F MH,ORN,4 BOLT,TWIN 6F,W/ANC BOLTS	30'	TWIN 6' ARMS	11"-12"
7010301	POLE,ALUM,30F MH,ORN,4 BOLT,TRUSS 15F,W/ANC BOLTS	30'	15' ARM	10"-11"
7010298	POLE,ALUM,30F MH,ORN,4 BOLT,TRUSS 12F,W/ANC BOLTS	30	12' ARM	10"-11"
7003754	POLE,ALUM,25F MH,ORN,4 BOLT,TWIN 6F,W/ANC BOLTS	25'	TWIN 6' ARMS	10"-11"
7003222	POLE,ALUM,30F MH,ORN,4 BOLT,TWIN 10F,W/ANC BOLTS	25'	TWIN 10' ARMS	11"-12"
7003218	POLE,ALUM,25F MH,ORN,4 BOLT,SINGLE 4F,W/ANC BOLTS	25'	4' ARM	10"-11"
7001420	POLE,ALUM,25F MH,ORN,4 BOLT,SINGLE 6F,W/ANC BOLTS	25'	6' ARM	10"-11"
7001419	POLE,ALUM,25F MH,ORN,4 BOLT,TRUSS 10F,W/ANC BOLTS	25'	10' ARM	10"-11"
7001418	POLE,ALUM,30F MH,ORN,4 BOLT,SINGLE 6F,W/ANC BOLTS	30	6' ARM	10"-11"
7001417	POLE,ALUM,30F MH,ORN,4 BOLT,TRUSS 10F,W/ANC BOLTS	30'	10' ARM	10"-11"
7001416	POLE,ALUM 30F MH,ORN,4 BOLT,SINGLE 8F,W/ANC BOLTS	30'	8' ARM	10"-11"
3008584	POLE,ALUMINUM,30' MH,WITH BREAKAWAY BASE FLANGE,CONTEMPORARY LT, PAINTED STANDARD BLACK POWDER COAT FINISH	30'	N/A	10"-11"
3008583	POLE,ALUMINUM,35' MH,WITH BREAKAWAY BASE FLANGE, 8" x .156",BLACK,CONTEMPORARY (JUST FOR UK)	35'	N/A	11"-12"

Electric System
Codes & Standards

STREET LIGHT CONSTRUCTION ANCHOR BASE - UNDERGROUND COBRA HEAD

80 08 44
Rev.

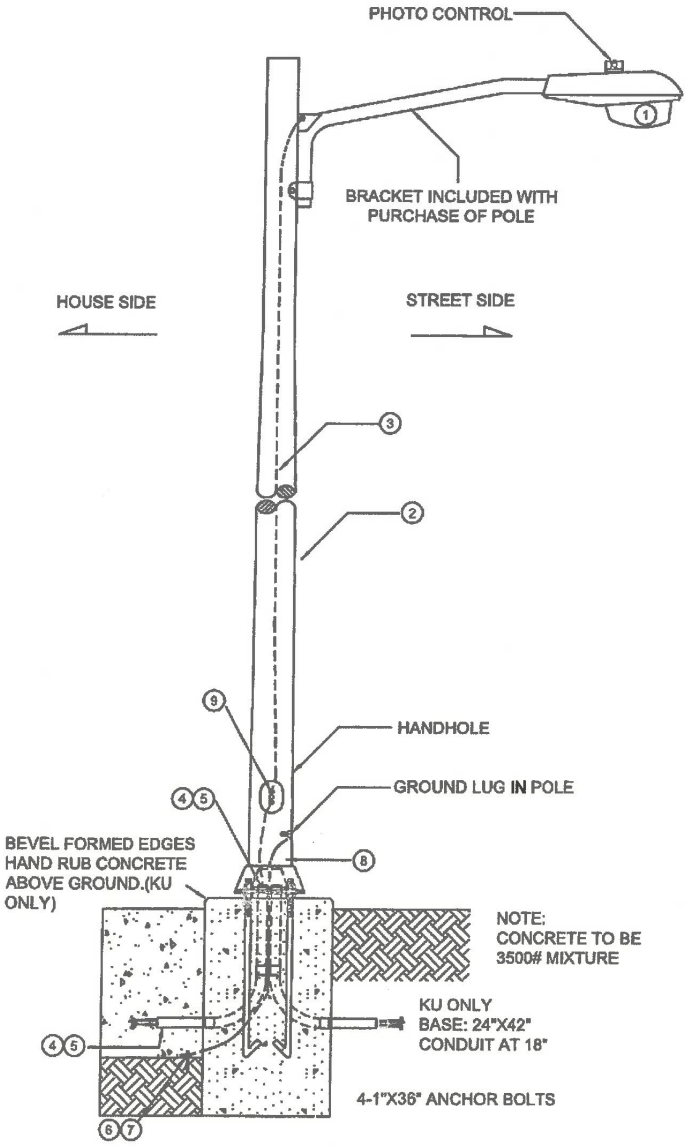
NOTE: FOR BREAKAWAY CONSTRUCTION, ANCHOR BASE DEPTH MUST BE INCREASED SO THAT THE ANCHOR BOLTS DO NOT EXCEED 4" ABOVE GRADE.

SEE 80 08 04
FOR KY DOT
COMPLIANT FOUNDATION

MATERIAL LIST

ITEM	IIN	DESCRIPTION	01
1	VARIES	LAMP - SEE STD 800000	1
2	VARIES	POLE - SEE STD 800002	1
3	7006487 OR	CABLE,600V/UG,#6-#6,2/C AAC DUPLEX,XLP,CLAFLIN	*
3	7001357	CABLE,600V,#12,SOLID,2/C W/GROUND,TYPE UF-B,OH & UG	*
4	7000674 OR	CONDUIT,PVC,1"X10',SCH 40,LONG BELL END,GREY	1
4	7006882	CONDUIT,PVC,2"X20',SCH 40,LONG BELL END,GREY	1
5	7010088 OR	ELBOW,CONDUIT,PVC,1"XSTD(5-3/4"),SCH 40,90 DEG,DEEP SOCKET	1
5	7001206	ELBOW,CONDUIT,PVC,2"X24",SCH 40,90 DEG,DEEP SOCKET,GREY	1
6	7000886	ROD,GROUND,5/8"X8',BONDED COPPER	1
7	7000887	CLAMP,GROUND ROD,5/8",8-1/0,HEX,CU,HEAVY DUTY	1
8	7005817	CONDUCTOR,OH WIRE,4,CU,BARE,SD,SOLID,25 LB. SPOOL	*
9	7000420	CONNECTOR,COMPRESSION,TAP,AL,4-2:4-2A,6-4-1STR	2

* AS REQUIRED



LG&E KU

Electric Design And Construction Standards

Replaces
LGE None
KU A-9-8.0

By: Hethcox/Jordan
09/11/2018
Page 1 of 1

807 KAR 5:041. Electric.

RELATES TO: KRS Chapter 278
STATUTORY AUTHORITY: KRS 278.280(2)
NECESSITY, FUNCTION, AND CONFORMITY: KRS 278.280(2) provides that the commission shall prescribe rules for the performance of any service or the furnishing of any commodity by the utility. This administrative regulation establishes general rules which apply to electric utilities.

Section 1. Definitions. For purposes of this administrative regulation:
(1) "Applicant" means for purposes of Section 21 of this administrative regulation the developer, builder or other person, partnership, association, corporation or governmental agency applying for the installation of an underground electric supply system.
(2) "Building" means a structure enclosed within exterior walls or fire walls, built, erected and framed of component structural parts and designed for less than five (5) family occupancy.
(3) "Customer" means for purposes of Section 21 of this administrative regulation the developer, builder or other person, partnership, association, corporation or governmental agency applying for installation of an underground electric supply system.
(4) "Customer premises" means the building for which service is intended or in use.
(5) "Distribution system" means electric service facilities consisting of primary and secondary conductors, transformers, and necessary accessories and appurtenances for furnishing electric power at utilization voltage.
(6) "Multiple-occupancy building" means a structure enclosed within exterior walls or fire walls, built, erected and framed of component structural parts and designed to contain five (5) or more individual dwelling units.
(7) "Subdivision" means a tract of land which is divided into ten (10) or more lots for the construction of new residential buildings, or for construction of two (2) or more new multiple occupancy buildings.

Section 2. General Requirements. Every utility shall furnish adequate service and facilities at rates filed with the commission, and in accordance with administrative regulations of the commission and applicable rules of the utility. Energy shall be generated, transmitted, converted and distributed by the utility, and utilized, whether by the utility or the customer, in such manner as to obviate undesirable effects upon the operation of standard services or equipment on the utility, its customers and other utilities.

Section 3. Acceptable Standards. A utility shall construct and maintain its plant and facilities in accordance with good accepted engineering practices. Unless otherwise specified by the commission, the utility shall use applicable provisions in the following publications as standards of accepted good engineering practice for construction and maintenance of plant and facilities, herein incorporated by reference:
(1) National Electrical Safety Code; ANSI C-2. 1990 Edition, available by contacting the IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, New Jersey 08855-1331. This material is also available for inspection and copying, subject to copyright law, at the offices of the Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602, Monday through Friday between the hours of 8 a.m. to 4:30 p.m. local time.
(2) National Electrical Code; ANSI-NFPA 70. 1990 Edition, available by contacting the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02169. This material is also available for inspection and copying, subject to copyright law, at the offices of the Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602, Monday through Fri-

day between the hours of 8 a.m. to 4:30 p.m. local time.

(3) American National Standard Code for Electricity Metering; ANSI C-12.1. 1982 Edition, available by contacting the Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th Street, New York, New York 10017;

(4) USA Standard Requirements, for Instrument Transformers; ANSI Standard C57.13, 1978 Edition, available by contacting the IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, New Jersey 08855-1331. This material is also available for inspection and copying, subject to copyright law, at the offices of the Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602, Monday through Friday between the hours of 8 a.m. to 4:30 p.m. local time.

(5) The adoption and applicability of the National Electrical Code as a standard of utility construction is limited to electric utility auxiliary buildings which are not an integral part of a generating plant, substation, or control center. Integral part is defined as essential to the operation or necessary to make complete.

(6) All materials incorporated by reference above are available for public inspection and copying at the Public Service Commission of Kentucky, 211 Sower Boulevard, Frankfort, Kentucky 40601, between the hours of 8 a.m. and 4:30 p.m.

Section 4. Generating Station Meter Records. Every utility shall install such watt-hour meters as necessary to obtain a record of output of its generating station or stations. Every utility purchasing electrical energy shall install such meters as necessary to furnish a proper record of its purchases, unless such instruments are installed by the selling company.

Section 5. Maintenance or Continuity of Service. (1) Each utility shall make all reasonable efforts to prevent interruptions of service, and when such interruptions occur shall endeavor to reestablish service with the shortest possible delay. Whenever service is necessarily interrupted or curtailed for the purpose of working on equipment, it shall be done at a time if practicable, that will cause least inconvenience to customers, and those customers which may be seriously affected shall be notified in advance, except in cases of emergency.

(2) Each utility shall keep a record of: time of starting and shutting down the principal units of its power station equipment and feeders for major divisions; indications of sufficient switchboard instruments to show voltage and quantity of the load; all interruptions to service affecting the entire distribution system of any single community or important division of a community; and date and time of interruption, date and time of restoring service, and when known, cause of each interruption.

(3) When complete distribution systems or portions of communities have service furnished from unattended stations, the utility shall keep these records to the extent practicable. The records of unattended stations shall show interruptions which require attention to restore service, with estimated time of interruption. Breaker or fuse operations affecting service shall also be indicated even though duration of interruption may not be known.

Section 6. Voltage and Frequency. (1) Each utility shall adopt a standard nominal voltage or standard nominal voltages, as required by its distribution system for its entire constant-voltage service, or for each of several districts into which the systems may be divided, which standard voltages shall be stated in every schedule of rates of each utility or in its terms and conditions of service.

(2) Voltage at the customer's service entrance or connection shall be maintained as follows:

(a) For service rendered primarily for lighting purposes, variation in voltage between 5 p.m. and 11 p.m. shall not be more than five (5) percent plus or minus the nominal voltage adopted, and total variation of voltage from minimum to maximum shall not exceed six (6) percent of the nominal voltage.

(b) 1. For service rendered primarily for power purposes, voltage variation shall not at any time exceed ten (10) percent above or ten (10) percent below standard nominal voltage.

2. Where a limited amount of lighting is permitted under these contracts, the entire load shall be considered power as far as voltage variation is concerned.

(c) Where utility distribution facilities supplying customers are reasonably adequate and of sufficient capacity to carry actual loads normally imposed, the utility may require that starting and operating characteristics of equipment on customer premises shall not cause an instantaneous voltage drop of more than four (4) percent of standard voltage nor cause objectionable flicker in other customer's lights.

(d) Equipment supplying constant current circuits shall be adjusted to furnish as nearly as practicable the rated current of the circuit supplied, and in no case shall the current vary more than four (4) percent above or below the circuit rating.

(3) Each utility supplying alternating current shall adopt a standard frequency of sixty (60) hertz which shall be stated in the schedule of rates of each utility.

(4) A frequency meter monitor shall be maintained for each system frequency. Accuracy of the frequency meter shall be checked each day and frequency shall be governed within limits as set forth in this section so that the frequency meters on the system are correct once daily.

(5) The following shall not be considered a violation of this section: Voltage variations in excess of those caused by operation of power apparatus on customer premises which require large starting currents and affect only the user of such apparatus, by action of the elements and infrequent and unavoidable fluctuations of short duration due to system operation.

(6) Greater variation of voltage than specified under this section may be allowed if service is supplied directly from a transmission line, if emergency service, or if in a limited or extended area in which customers are widely scattered or business done does not justify close voltage administrative regulation. In such cases the best voltage administrative regulation shall be provided that is practicable under the circumstances.

Section 7. Voltage Surveys and Records. (1) Every utility shall have two (2) or more portable indicating voltmeters and two (2) or more recording or graphic voltmeters of type and capacity suited to the voltage supplied. Every utility shall make a sufficient number of voltage surveys to indicate the service furnished from each center of distribution. To satisfy the commission of its compliance with voltage requirements, each utility shall keep at least one (1) of these instruments in continuous service at some representative point on its system. All records of the most recent voltage surveys taken within the last three (3) calendar years shall be available for inspection by the utility's customers and commission staff.

(2) Each graphic recording voltmeter shall be checked with a working standard indicating voltmeter when it is placed in operation and when it is removed, or periodically if the instrument is in a permanent location. Notations on each chart shall indicate beginning time and date of registration and when the chart was removed, as well as the point where voltage was taken, and results of the check with indicating voltmeter.

Section 8. Servicing Utilization Control Equipment. (1) Utilities shall service and maintain any equipment they use on customer's premises and shall adjust thermostats, clocks, relays, or time switches, if such devices must be so adjusted to provide service in accordance with their rate provisions.

(2) Time switches used by the utility for controlling equipment such as water heaters and street lights shall be of such quality that the timing mechanism may be adjusted to be accurate within ten (10) minutes per month. Time switches used by the utility for controlling street lighting or display lighting shall be inspected or monitored at least once a month and, if in error, adjusted. Time switch-

es shall also be adjusted upon complaint if found in error or when service interruptions cause them to be in error by one-half (1/2) hour or more.

(3) Time switches and control devices used by the utility for controlling off-peak appliances shall be inspected or monitored periodically and adjusted if in error, and also adjusted upon complaint if found in error or whenever service interruptions result in error of two (2) hours or more or in supplying service to off-peak appliances during peak periods.

Section 9. Measuring Customer Service. (1) All energy sold within the State of Kentucky shall be measured by commercially acceptable measuring devices owned and maintained by the utility, except where it is impracticable to meter loads, such as multiple street lighting, temporary or special installations, in which case consumption may be calculated. The utility shall meter its own electrical energy use except when such service is for emergency or incidental lighting such as outdoor substations, or at remote points on its transmission or distribution lines. All other electrical quantities which the utility's tariff indicates are to be metered shall be metered by commercially acceptable instruments owned and maintained by the utility.

(2) The utility shall regard each point of delivery as an independent customer and meter the power delivered at each point. Combined meter readings shall not be taken at separate points, nor shall energy used by more than one (1) residence or place of business on one (1) meter be measured to obtain a lower rate.

(3) Metering facilities located at any point where energy may flow in either direction and where the quantities measured are used for billing purposes shall consist of meters equipped with ratchets or other devices to prevent reverse registration and be so connected as to separately meter energy flow in each direction.

(4) Whenever possible reactive meters required to meet the conditions of a given rate schedule shall be either all ratcheted or none shall be ratcheted. Reactive metering shall not be employed for determining average power factor for billing purposes where energy may flow in either direction or where a customer may generate an appreciable amount of his own requirements.

(5) Meters which are not direct reading and those operating from instrument transformers shall have the multiplier plainly marked on the dial of the instrument or otherwise suitably marked and all charts taken from recording meters shall be marked with the record date, meter number, customer and chart multiplier.

(6) The register ratio shall be marked on all electro-mechanical meter registers. Meters already in service may be so marked when they are tested.

(7) The watt-hour constant for the meter itself shall be placed on all watt-hour meters. Meters already in service shall be so marked when they come to the meter shop.

Section 10. Service Connections. (1) The utility shall pay all costs of a service drop or an initial connection to its line with the customer's service outlet, except the attachment of the wire support to customer premises. When the customer's outlet is inaccessible to the utility, or the customer desires that the service outlet on any building be at a location other than that closest to the utility's line, cost of such special construction as necessary shall be borne by the customer. The utility shall furnish at its expense an amount of wire, labor and material equivalent to that furnished for a like service connection not requiring such special construction.

(2) Underground service requirements and administrative regulations shall be established by each utility and be on file with the commission.

(3) All equipment and material furnished by the utility at its own expense shall remain the property of the utility and may be removed by it at any reasonable time after discontinuance of service.

Section 11. Distribution Line Extensions. (1) Normal extensions. An extension of 1,000 feet or

less of single phase line shall be made by a utility to its existing distribution line without charge for a prospective customer who shall apply for and contract to use the service for one (1) year or more and provides guarantee for such service. The "service drop" to customer premises from the distribution line at the last pole shall not be included in the foregoing measurements. This distribution line extension shall be limited to service where installed transformer capacity does not exceed 25 KVA. Any utility which extends service to a customer who may require polyphase service or whose installed transformer capacity will exceed 25 KVA may require the customer to pay in advance additional cost of construction which exceeds that for a single phase line where the installed transformer capacity does not exceed 25 KVA.

(2) Other extensions.

(a) When an extension of the utility's line to serve an applicant or group of applicants amounts to more than 1,000 feet per customer, the utility may, if not inconsistent with its filed tariff, require total cost of the excessive footage over 1,000 feet per customer to be deposited with the utility by the applicant or applicants, based on the average estimated cost per foot of the total extension.

(b) Each customer receiving service under such extension will be reimbursed under the following plan: Each year, for a refund period of not less than ten (10) years, the utility shall refund to the customer(s) who paid for the excessive footage the cost of 1,000 feet of extension in place for each additional customer connected during the year whose service line is directly connected to the extension installed and not to extensions or laterals therefrom. Total amount refunded shall not exceed the amount paid the utility. No refund shall be made after the refund period ends.

(c) For additional customers connected to an extension or lateral from the distribution line, the utility shall refund to any customer who paid for excessive footage the cost of 1,000 feet of line less the length of the lateral or extension.

(3) An applicant desiring an extension to a proposed real estate subdivision may be required to pay the entire cost of the extension. Each year, for a period of not less than ten (10) years, the utility shall refund to the applicant who paid for the extension a sum equivalent to the cost of 1,000 feet of the extension installed for each additional customer connected during the year. Total amount refunded shall not exceed the amount paid to the utility. No refund shall be made after the refund period ends.

(4) Nothing contained herein shall be construed as to prohibit the utility from making extensions under different arrangements if such arrangements have been approved by the commission.

(5) Nothing contained herein shall be construed to prohibit a utility from making at its expense greater extensions than herein prescribed, if similar free extensions are made to other customers under similar conditions.

(6) Upon complaint to and investigation by the commission, a utility may be required to construct extensions greater than 1,000 feet upon a finding by the commission that such extension is reasonable.

Section 12. Distribution Line Extensions to Mobile Homes. (1) All extensions of up to 150 feet from the nearest distribution line shall be made without charge.

(2) Extensions greater than 150 feet from the nearest distribution line and up to 300 feet shall be made if the customer pays the utility a "customer advance for construction" of fifty (50) dollars in addition to any other charges required by the utility for all customers. This advance shall be refunded at the end of one (1) year if service to the mobile home continues for that length of time.

(3) For extensions greater than 300 feet and less than 1,000 feet from the nearest distribution line, the utility may charge an advance equal to reasonable costs incurred by it for that portion of service beyond 300 feet plus fifty (50) dollars. Beyond 1,000 feet the extension policies set forth in Section 11 of this administrative regulation shall apply.

(a) This advance shall be refunded to the customer over a four (4) year period in equal amounts

for each year service is continued. The customer advance for construction of fifty (50) dollars shall be added to the first of four (4) refunds.

(b) If service is discontinued for a period of sixty (60) days, or the mobile home is removed and another does not take its place within sixty (60) days, or is not replaced by a permanent structure, the remainder of the advance shall be forfeited.

(c) No refunds shall be made to any customer who did not make the advance originally.

(4) If a utility implements specific requirements pertaining to mobile homes, such requirements shall be subject to approval by the commission and comply with the provisions of this administrative regulation.

Section 13. Testing Equipment and Standards. (1) Each utility shall maintain sufficient laboratories, meter testing shops, standards, instruments and facilities to determine accuracy of all types of meters and measuring devices used by the utility except as provided in 807 KAR 5:006, Section 17.

(2) The following testing equipment shall be available as minimum requirements for each utility or agency making tests or checks for a utility pursuant to 807 KAR 5:006, Section 17(2):

(a) One (1) or more working watt-hour standards and associated devices of capacity and voltage range adequate to test all watt-hour meters used by the utility.

(b) One (1) or more watt-hour standards, which shall be the utility's master watt-hour standards, used for testing the working watt-hour standards of the utility. These standards shall be of an approved type, shall be well compensated for both classes of temperature errors, practically free from errors due to ordinary voltage variations, and free from erratic registration. These master watt-hour standards shall be of capacity and voltage range adequate to test all working watt-hour standards at all loads and voltages at which they are used. These standards shall be kept permanently at one place and not used for routine testing.

(c) Working indicating instruments, such as ammeters, voltmeters and watt-meters, of such various types required to determine the quality of service to customers.

(d) A voltmeter and ammeter, which shall be master indicating instruments, and which shall be used for testing of working indicating and recording instruments. These instruments shall be of an approved type and of accuracy class and range sufficient to determine accuracy of working instruments to within five-tenths (0.5) percent of all ranges and scale deflections at which working instruments are used. They shall be kept permanently at one place and not used for routine testing.

(3) The utility's master watt-hour standards shall not be in error by more than plus or minus three-tenths (0.3) percent at 100 percent power factor, nor more than plus or minus five-tenths (0.5) percent at fifty (50) percent power factor at loads and voltages at which they are used, and shall not be used to check or calibrate working standards unless the master standard has been certified as to accuracy by the commission within the preceding twelve (12) months. Each master watt-hour standard shall have a history card and calibration data available, and when used to calibrate working standards, correction for any error of the master standard shall be applied.

(4) All working watt-hour standards when regularly used shall be compared with a master standard at least once in every four (4) weeks. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.

(5) Working watt-hour standards shall be adjusted, if necessary, so that their accuracy will be within plus or minus three-tenths (0.3) percent at 100 percent power factor and within plus or minus five-tenths (0.5) percent at fifty (50) percent lagging power factor at all voltages and loads at which the standard may be used. A history and calibration record shall be kept for each working watt-hour standard showing all pertinent data and name of person performing tests.

(6) After having adjusted working watt-hour standards to the accuracy specified above, service measuring equipment shall be adjusted to within the accuracies required, assuming working watt-hour standards to be 100 percent accurate.

(7) If calibration charts are attached to working watt-hour standards and the error indicated is applied to all tests run and the accuracy on any range has not varied more than two-tenths (0.2) percent during the past twelve (12) regular test periods, accuracy limits may be extended to plus or minus five-tenths (0.5) percent at 100 percent power factor and plus or minus seven-tenths (0.7) percent at fifty (50) percent lagging power factor at all voltages and loads at which the standard may be used.

(8) The utility's master indicating instruments shall not be in error by more than plus or minus five-tenths (0.5) percent of indication at commonly used scale deflections and shall not be used to check or calibrate working indicating instruments unless the master instrument has been checked and adjusted, if necessary, and certified as to accuracy by the commission within the preceding twenty-four (24) months. A calibration record shall be maintained for each instrument.

(9) All working indicating instruments shall be checked against master indicating instruments at least once in each six (6) months. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

Section 14. Check of Standards by Commission. (1) Each utility, and/or agency making tests or checks for a utility, shall submit to the commission Meter Standards Laboratory, its master watt-hour standard once in each year, and its master indicating voltmeter and ammeter once in each two (2) years.

(2) At the discretion of the commission any or all of these required tests may be made at the utility's or agency's testing facility by means of portable transfer standards. If the standards satisfy the requirements of the commission a Certificate of Accuracy shall be issued by the commission's Division of Engineering.

(3) Each utility which normally checks its own master watt-hour standards and master indicating instruments against primary standards such as precision watt-meters, volt boxes, resistances, standard cells, potentiometers, and timing devices, shall calibrate the master watt-hour standards and indicating instruments before they are submitted to the commission for test, and attach to them a record of such calibration.

Section 15. Testing of Metering Equipment. (1) Testing of any unit of metering equipment shall consist of a comparison of its accuracy with a standard of known accuracy. All metering equipment shall be in good order, and shall be adjusted to as close to zero error as possible.

(2) No meter or measuring device shall be deliberately set in error by any amount. Because of unavoidable irregularities of work done on a commercial scale, some accuracy tolerance shall be allowed. Meters shall be set as near as practicable to 100 percent accuracy but in no case shall the inaccuracy exceed one (1) percent. Further, meters with defective parts shall be repaired regardless of their accuracy.

(3) Metering equipment, including instrument transformers and demand meters, shall be tested for accuracy prior to being placed in service, periodically in accordance with the schedule below, upon complaint, when suspected of being in error, or when removed from service for any cause.

Period Test Schedule		
	Self-Contained Meters	
	Single phase	8 years
	3 wire network	8 years
	Polyphase	6 years
Meters used with instrument transformers		

	Single phase	6 years
	Polyphase	4 years
Demand Meters		
	Indicating block-interval and lagged-demand meters	same as associated watt-hour meter
	Graphic and pulse operated recording demand meters	2 years
Instrument Transformers		
	Current: high burden test	same as associated watt-hour meter
	Potential: secondary voltage test	same as associated watt-hour meter
	Var-hour Meters	same as associated watt-hour meter
Direct Current Watt-hour Meters:		
	Up to and including 6 KW	4 years
	Over 6 KW through 100 KW	2 years
	Over 100 KW	1 year

(4) Tests may be made at a meter shop, on the customer's premises, or in a mobile shop.

Section 16. Sample Testing of Single Phase Meters. A utility desiring to adopt a scientific sample meter testing plan for single phase meters shall submit its application to the commission for approval. Upon approval the sample testing plan may be followed in lieu of the periodic test prescribed in Section 15(3) of this administrative regulation. The plan shall include the following:

(1) Meters shall be divided into separate groups to recognize differences in operating characteristics due to changes in design, taking into consideration date of manufacture and serial number.

(2) The sampling procedure shall be based upon accepted statistical principles.

(3) The same sampling procedure shall be applied to each group.

(4) Each utility authorized to test meters by sample meter testing plan shall comply with the following conditions:

(a) The number of meters in addition to the sample shall be taken from those meters in each group longest in service since last test unless a particular meter type is known to be increasing the percentage of meters requiring test for the sample group. In such a case where a particular meter type is increasing the percentage of meters requiring test in any group, these meters may be selected first regardless of test date with any additional tests as required for that group coming from those in that group longest in service since last test. Each year the utility shall use the following table to determine the percentage of the total meters in each group to be tested.

Percentage of Meters Within Limits of 2% Fast or Slow (Indicated by Sample)		Percentage of Meters to be Tested the Next Year
99.0	100.0	2
98.0	98.9	4
97.0	97.9	6
96.0	96.9	8
95.0	95.9	10
93.0	94.9	12
91.0	92.9	14
Less than	91.0	16

(b) Provided, however, that no meter shall remain in service without periodic test for a period longer than twenty-five (25) years.

(5) Whenever a meter is found to be more than two (2) percent fast or slow, refunds or back billing shall be made for the period during which the meter error is known to have existed or if not known for one-half (1/2) the elapsed time since the last test but in no case to exceed three (3) years. This provision shall apply only when sample testing of single phase meters has been approved by the commission and utilized by the utility.

Section 17. Test Procedures and Accuracy Requirements. (1) Meters and associated devices shall be tested at the loads indicated below and adjusted as close as practicable to zero error when found to exceed the tolerance prescribed below.

AC Watt-hour Meters		
% of Test Current	Power Factor	Allowable Tolerance
100	1.0	+ or - 1.0%
10	1.0	+ or - 1.0%
100	0.5	+ or - 1.0%
DC Watt-hour Meters		
% of Test Current		Allowable Tolerance
100	1.0%	
10	1.0%	

(a) Only one (1) test run shall normally be required at each test configuration. However if the test indicates the meter is more than two (2) percent in error fast or slow, additional tests shall be made to verify accuracy prior to refunding or back billing the customer.

(b) When a meter is tested on complaint or request, additional test runs shall be made and care exercised to insure that any trouble with the meter will be detected.

(c) For refund and back billing purposes, accuracy of the meter shall be determined by adding the average registration at light load (ten (10) percent of test current) and the average registration at full load (100 percent of test current) and dividing by two (2).

(2) Demand meters. A demand meter, demand register, or demand attachment used to measure customer's service shall:

(a) Be in good mechanical and electrical condition.

(b) Have proper constants, indicating scale, contact device, and resetting device.

(c) Not register at no load.

(d) Be accurate to the following degrees:

1. Graphic meters which record quantity-time curves and integrated-demand meters shall be accurate to within plus or minus two (2) percent of full scale throughout their working range. Timing elements measuring specific demand intervals shall be accurate to within plus or minus two (2) percent and the timing element which serves to provide a record of the time of day when demand occurs shall be accurate to within plus or minus four (4) minutes in twenty-four (24) hours.

2. Lagged-demand meters shall be accurate to within plus or minus two (2) percent at final indication.

(3) Instrument transformers.

(a) Instrument transformers used in conjunction with metering equipment to measure customer's service shall:

1. Be in proper mechanical condition and have electrical insulation satisfactory for the service on which used.

2. Have characteristics such that the combined inaccuracies of all transformers supplying one (1) or more meters in a given installation shall not exceed the following:

	100% Power Factor		50% Power Factor	
	10% Current	100% Current	10% Current	100% Current
Purchased after Jan. 1, 1942	1%	.75%	3%	2%
Purchased prior to Jan. 1, 1942	2%	1.50 %	5%	3%

(b) Meters used in conjunction with instrument transformers shall be adjusted so that overall accuracies will come within the limits specified in this administrative regulation.

(c) Instrument transformers shall be tested with the meter with which they are associated by making an overall test, or may be checked separately. If transformers are tested separately, meters shall also be checked to see that overall accuracy of installation is within the prescribed accuracy requirements.

(d) Results of tests of instrument transformers shall be kept on record and be available for use during the life of the transformer.

(e) Phase shifting transformers shall have secondary voltages under balanced line voltage conditions within one (1) percent plus or minus of the voltage impressed on the primary.

Section 18. Location of Meters. (1) Meters shall be installed in a clean, dry, safe, convenient place as free as possible from vibration. Meters shall be easily accessible for reading, testing, and making necessary adjustments and repairs, and where indoor type meters are necessary they shall not be placed in coal or wood bins or on partitions forming bins, nor on any unstable supports. Unless absolutely unavoidable, meters shall not be installed in attics, sitting rooms, bathrooms, bedrooms, restaurant kitchens, over doors, over windows, or in any location where visits of the meter reader or tester will cause annoyance to the customer or a severe inconvenience to the utility.

(2) Districts subject to flood are excepted from this rule as far as it applies to the location of meters.

(3) Proper provision shall be made by the customer for installation of the utility's meter. Unless the

meter is to be mounted upon a panel or installed within a cabinet, such provision shall consist of a board not less than three-quarters (3/4) of an inch in thickness which shall be mounted not less than five (5) or not more than seven (7) feet from the floor, and in general as near as possible to point of entrance of service. At least six (6) inches clear space shall be available, on all sides of the meter board and not less than thirty (30) inches in front of it. The above provisions as to method of mounting and height from floor do not apply to the installation of weatherproof outdoor meters. Electric meters shall not be installed close to either water or gas meters or anything liable to damage the meter, thereby constituting a hazard to customer's safety and continuous service.

(4) When more than one (1) meter is installed without a meter cabinet in the same building, proper space shall be allotted and provision made by the customer for locating the meters at one (1) place. When a number of meters are placed in the same cabinet or upon the same board, each meter shall be tagged or marked to indicate the circuit metered by it.

Section 19. Overhead and Underground Wire Entrances. (1) The overhead wire entrance shall be located on the exterior of the building nearest the utility's lines at a point not less than twelve (12) nor more than thirty (30) feet above the ground. When proper ground clearance cannot be obtained due to height of building, a proper supporting structure shall be provided by the customer unless arrangements can be made with the utility whereby their overhead service wires can be carried to the building in such a manner that these wires will not constitute an obstruction to free passage of vehicles or fire fighting apparatus.

(2) Approval shall be obtained from the utility as to the proper location for a service entrance.

(3) New service drops, both overhead and underground, shall be installed in accordance with the National Electrical Safety Code.

Section 20. Operation of Illegal Gambling Devices. (1) When an electric utility, subject to the jurisdiction of this commission, is notified in writing by a federal or state law enforcement agency, the Attorney General of Kentucky, a Commonwealth's Attorney or a County Attorney acting in his official capacity, that electric energy furnished by it is being used or will be used for operating an illegal gambling device, it shall discontinue rendering electric service to such customer, after reasonable notice to the customer. No damages, penalty or forfeiture, civil or criminal, shall be found against any electric utility for any act done in compliance with any such notice received from the law enforcement agency or officer. Nothing in this section shall be deemed to prejudice the right of any person affected thereby to secure an appropriate judicial determination that such service should not be discontinued, or should be restored.

(2) As provided by KRS 278.230, any electric utility subject to commission jurisdiction shall furnish to the commission upon request any records or information in the possession of such electric utility that may assist in the enforcement of this rule.

Section 21. Underground Electric Distribution Systems for New Residential Customers. (1) Purpose of rules. To formulate requirements for underground electric distribution systems for all new customers of those systems which will insure safe and adequate service and which will be uniformly applicable within a utility's service area.

(2) Applicability. New residential customers and subdivisions as defined below after the effective date of this rule.

(3) Rights of way and easements.

(a) The utility shall construct, own, operate and maintain distribution lines only along easements, public streets, roads and highways which are by legal right accessible to the utility's equipment and which the utility has legal right to occupy, and on public lands and private property across which rights of way and easements satisfactory to the utility may be obtained without cost or condemnation

by the utility.

(b) Rights of way and easements suitable to the utility for underground distribution facilities shall be furnished by the applicant in reasonable time to meet service requirements. The utility may require that the applicant make the area in which underground distribution facilities are to be located accessible to the company's equipment, remove all obstructions from such area, stake to show property lines and final grade, perform rough grading to reasonable approximation of final grade, and maintain clearing and grading during construction by the utility. The utility may require that suitable land rights be granted to it, obligating the applicant and subsequent property owners to provide continuing access to the utility for operation, maintenance or replacement of its facilities, and to prevent any encroachment in the utility's easement or substantial changes in grade or elevation.

(4) Installation of underground distribution system within new subdivision.

(a) Where appropriate contractual arrangements have been made, the utility shall install within the subdivision an underground electric distribution system of sufficient capacity and suitable materials which, in its judgment, will assure that the property owners will receive safe and adequate electric service for the foreseeable future.

(b) Facilities required to be underground:

1. All single phase conductors installed by the utility shall be underground. Appurtenances such as transformers, pedestal-mounted terminals, switching equipment and meter cabinets may be placed above ground.

2. Three (3) phase primary mains or feeders required within a subdivision to supply local distribution or to serve individual three (3) phase loads may be overhead unless underground is required by governmental authority or chosen by the applicant, in either of which case the differential cost of underground shall be borne by the applicant.

(c) If the applicant has complied with the requirements herein and with the utility's specifications on file with the commission, and has given the utility not less than 120 days written notice prior to anticipated date of completion (i.e., ready for occupancy) of the first building in the subdivision, the utility shall complete installation thirty (30) days prior to estimated completion date. (Subject to weather and ground conditions and availability of materials and barring extraordinary or emergency circumstances beyond reasonable control of the utility.) However, nothing in these administrative regulations shall be interpreted to require the utility to extend service to portions of subdivisions not under active development.

(5) Schedule of charges.

(a) Within sixty (60) days after the effective date of these rules, each utility shall file with the commission a statement setting forth the utility's policy with respect to electric underground extensions. Such policy shall provide for payment by the applicant for the difference between the cost of providing underground facilities and that of providing overhead facilities. The payment made by applicant shall be expressed in terms of an amount per foot of conductor or other appropriate measure.

(b) The utility's policy as filed with the commission shall set forth an "estimated average cost differential," if any, between the average or representative cost of underground distribution systems and of equivalent overhead distribution systems within the utility's service areas. The payment made by applicant as provided for in paragraph (a) of this subsection shall not be more than the estimated average cost differential and shall be nonrefundable.

(c) Detailed supporting data used to determine estimated average cost differential shall be concurrently filed by the utility with the commission and shall be updated annually.

(d) Applicant may be required to deposit the entire estimated cost of the extension. If this is done, the amount deposited in excess of the normal charge for underground extensions, as provided in paragraph (a) of this subsection, shall be refunded to the applicant over a ten (10) year period as provided in Section 11 of this administrative regulation.

(e) Upon agreement by both parties, if the applicant chooses to perform all necessary trenching and backfilling in accordance with utility specifications, the utility shall credit applicant's cost in an amount equal to the utility's cost for trenching and backfilling.

(f) Utility extension from the property or boundary of the subdivision to its existing supply facilities shall normally be made overhead, and any deposit required for that extension is subject to refund under Section 11 of this administrative regulation. Upon request, such extension may be made underground, if the applicant agrees to pay the excess cost for the underground extension, which excess cost shall be nonrefundable.

(g)1. Point of service shall be that point where utility facilities join customer facilities, irrespective of the location of the meter. Such point of service shall normally be either at the property line or at the corner of the building nearest the point at which underground systems enter the property to be served, depending upon whether the utility or the customer owns the underground service lateral.

2. If established utility practice dictates service termination at the customer's property line, the utility shall credit the applicant fifty (50) dollars or the equivalent cost of an overhead service line to the applicant's meter base, whichever is greater.

3. Where established utility practice does not dictate service termination at the customer property line, the utility shall include in its underground plan the furnishing, installation, ownership, and maintenance of the service lateral to the meter base providing the applicant installs in the building adequate electric service entrance capacity to the satisfaction of the utility to assure that the underground service conductors will be adequate to handle present and future load requirements of the building. In this instance the utility will determine the size and type of service lateral conductors and appurtenances to be used in any installation.

4. If, by mutual agreement of the parties, service terminates at some other point on the building or property, the applicant shall pay the full cost of any additional extension required in excess of that provided for in paragraph (g)1, 2 and 3 of this subsection.

(h) When an existing utility-owned supply circuit or service lateral requires replacement or reinforcement due to added loads, etc., the utility at its expense will replace or reinforce it.

(i) Nothing in this administrative regulation shall be construed to prevent any utility from assuming any part of the cost differential of providing underground distribution systems within subdivisions, provided the utility demonstrates to the commission that such practice will not result in increased rates to the general body of rate payers.

(j) The utility shall not be obligated to install any facility within a subdivision until satisfactory arrangements for payment of charges have been completed by the applicant.

(6) Cooperation by applicant. Charges specified in these rules are based on the premise that each applicant will cooperate with the utility in an effort to keep the cost of construction and installation of the underground electric distribution system as low as possible and make satisfactory arrangements for payment of the above charges prior to installation of the facilities.

(7) Construction. All electrical facilities shall be installed and constructed to comply with applicable codes, rules and administrative regulations of the commission.

Section 22. Deviations from Rules. In special cases for good cause shown the commission may permit deviations from these rules. (8 Ky.R. 814; eff. 4-7-1982; 16 Ky.R. 2046; 2430; eff. 6-10-1990; 17 Ky.R. 2507; eff. 4-4-1991; TAm 1-30-2013; Crt eff. 3-27-2019.)

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 16

Responding Witness: John K. Wolfe

Q-16. Please describe in detail all maintenance that must be performed by the Company on each type of street light to ensure that it operates properly and provide a list of each component of the required maintenance and its monthly cost.

A-16. Normal maintenance consists of replacing the items listed in the table below as needed. The current unit costs are for materials specific to each installation and do not include associated installation costs (labor, minor materials, equipment, etc.), which are not tracked at this level of detail. Maintenance is required when the Company has identified or received a report that the street light is inoperative. The most common maintenance performed on a street light is the replacement of a burned out bulb and/or replacement of an inoperative photoelectric control. Additional maintenance activities include cable/conductor repair/replacements, pole replacements, and replacing mast arms.

Normal Street Light Maintenance Material

Item #	Unit Description	Unit Cost
7001343	LAMP,HPS,4000L,50W	$ 7.580
7001344	LAMP,HPS,5800L,70W	$ 6.85
7001345	LAMP,HPS,9500L,100W	$ 6.85
7001346	LAMP,HPS,22000L,200W	$ 8.230
7001347	LAMP,HPS,50000L,400W	$ 8.42
7001349	LAMP,MV,10000L,250W	$ 6.40
7001350	LAMP,MV,20000L,400W	$ 7.32
7001331	CONTROL,PHOTOELECTRIC,105-130V,GRAY COVER,ELECTRONIC,1000W,1800VA,TIME DELAYED,1.5 FCS TURN ON,CADMIUM-SULFIDE PHOTOCELL,MINIMUM 160 JOULE MOV ARRESTER,TWISTLOCK BASE,DUSK TO DAWN,USE IN 120V ONLY	$ 3.81

7001718	CAP,SHORTING,PHOTOCONTROL BASE,LOCKING TYPE	$ 4.34
7010269	STARTER,LIGHTING,HPS,50W-400W,PLUG-IN TYPE,GE	$ 33.15
	LED	
3027572	FIXTURE COLONIAL	$ 330.40
3024333	FIXTURE OB HEAD	$ 126.07
3024334	FIXTURE OB KIT	$ 189.67
3024532	FIXTURE COBRA	$ 167.23
3024534	FIXTURE COBRA	$ 218.06
3024533	FIXTURE COBRA	$ 324.37

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 17

Responding Witness: John K. Wolfe

Q-17. Please provide both the number and type of public street lights for LFUCG accounts for which service or maintenance was performed in each of the last three years and the same information for both KU's Kentucky jurisdictional operations and its entire system. In addition, please provide the basis for generating the above repair or maintenance order (i.e., referral from 311, customer complaint, KU) for each of the above.

A-17. KU system-wide repair orders for street and other outdoor lights during the periods in question are in the table below. KU does not track repairs by type.

	2018	2019	2020
Lexington	5,819	6,162	6,502
KU Jurisdictional	18,941	19,093	18,062
KU Entire System	20,021	20,062	19,102

KU does not track repairs by reporting source. Refer to the detailed response to Question No. 15 for the basis of KU's policies and practices regarding repairs and maintenance. Street light repairs that were referred by Lexcall 311 are shown in the table below.

	2018	2019	2020
Hotline Calls	1218	1,349	906

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 18

Responding Witness: John K. Wolfe

Q-18. Provide the average time to repair a malfunctioning street light from the time of discovery, either by public reporting or Company representative, initiation of work order; to the time the light is restored to operation, work order is closed.

A-18. For KU, the average time to respond to a street light outage report in 2020 was 1.42 days. In 2019, the average time to respond to a street light outage report was 1.67 days. Lights were restored to operation during this first run 96% of time in 2019 and 97% of the time in 2020.

For KU, the average time to repair (from discovery to the time the light is restored to operation) in 2020 was 2.01 days. In 2019, the average time to repair was 2.96 days.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 19

Responding Witness: John K. Wolfe

Q-19. Provide a chart of maintenance and repair calls for each street light for LFUCG and the total cost for each call, including both materials and labor.

A-19. KU does not track repairs by customer. See attached for a chart of maintenance and repair calls by address for all of Fayette County, for 2018 through 2020. System-wide, KU has approximately 19,728 streetlight work orders per year at an approximate average cost of $195 per order.

The attachment is being provided in a separate file in Excel format.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 20

Responding Witness: John K. Wolfe

Q-20. Provide separately the number of calls from the public regarding street lights paid for by LFUCG and the rest of the Company's system.

A-20. The Company does not track the number of calls from the public regarding street lights paid for by LFUCG and the rest of the Company's system.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 21

Responding Witness: John K. Wolfe

Q-21. Provide any internal policies or procedures with regards to street light maintenance, repair and replacement.

A-21. The procedure for street light maintenance, repair, and replacement consists of the following work practices:

- A reported light outage will be investigated within 2 working days by a trouble shooter or service technician.
  - Initial response is comprised of checking the bulb, photocell, voltage, and starter (if applicable).
  - Replacement of any of these failed components will be conducted at that time.
  - If it is identified that none of the above components are responsible for the lighting failure, the work will be transferred to the lighting repair work queue.

- A second-level response to light outages involves further investigation into the cause of the voltage failure.
  - Typical causes include:
    - Defective fixtures
    - Fuses
    - Third party damage (dig-ins)
    - Failed conductors
  - Depending on the type of repair needed, repairs may be made at this time or scheduled for a later date.

- A third-level response will include replacement of a feed to the light or a chain of lights.
  - This replacement would be conducted by means of boring, plowing, or trenching a new feed in conduit.
  - The time frame for this repair will be heavily dependent on weather, customer or city property impacts, and/or soil dynamics

See also the response to Question No.15.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 22

Responding Witness: John K. Wolfe

Q-22. Is KU able to ascertain, at any given time, the number of street lights paid for by LFUCG that are actually in proper working order? If so, please provide a detailed explanation, and further explain:

a. How many street lights (on average) are actually in proper working order at any given time;

b. Whether LFUCG is charged the monthly tariff rate for non-working street lights for the periods of time within which such street lights are non-operational or not working properly;

c. The amount of time it takes (on average) to bring such street lights into working order; and

d. Whether this information differs among different types of street lights. If so, please provide this information for each type of light.

A-22. No, KU cannot ascertain the number of street lights that are paid for by LFUCG that are operable at any given time. However, as described in the response to Question No. 15(a), KU proactively identifies street light outages and relies upon customers to report service problems.

a. All lights, unless reported otherwise, are considered to be in proper working order.

b. LFUCG pays a monthly tariff rate for all street lights it has requested and that rate schedule provides KU two business days to initiate a repair after notification by a customer.

c. See the response to Question No. 18.

d. See the response to Question No. 15(d).

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 23

Responding Witness: John K. Wolfe

Q-23. Please state how many existing street lights are scheduled (or anticipated) to be replaced by the Company over the next five years for which LFUCG currently and/or in the future will pay a monthly rate. Please provide the quantity of each type of light being removed and the quantity and type of light that will replace it.

A-23. KU has no scheduled replacements of any current LFUCG street lighting fixtures. Street lights on the Restricted Lighting Service rate will be replaced at fixture failure with an equivalent LED. KU cannot anticipate the rate at which RLS fixtures will fail and subsequently be replaced with an equivalent LED.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 24

Responding Witness: John K. Wolfe

Q-24. Please estimate based on historical maintenance how many existing street lights are anticipated to be replaced by KU over the next five years within Fayette County. Please provide an anticipated breakdown by rate code based on historical failures and replacements.

A-24. See the response to Question No. 14 for approximate fixture replacements for 2018, 2019, and 2020. Average annual fixture replacements for KU Jurisdictional is 2,095. The Company does not track replacements by rate code or by county. Based on historical maintenance the Company expects to replace approximately 2,095 fixtures with LED fixtures each year over the next 5 years.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 25

Responding Witness: John K. Wolfe

Q-25. In numerous portions of the filing, the Company makes reference to improving communications with the public, including improvements to the web pages and mobile applications. There does not appear to be any indication that the Company will include the ability to use the mobile application to report and "Geo-Tag" inoperable or malfunctioning street lighting.

a. Does the Company plan to include this capability in any mobile application upgrades, specifically the ability to "Geo-Tag" or more precisely locate the street light?

b. Currently the Company website has a very limited ability to report street light outages, will this be improved as part of the proposed community engagement improvements?

A-25.

a. The Company is considering the feasibility of developing this type of feature on the Company's App or Website, but has no definitive plans for deployment.

b. The company currently has no plans for improvement to the current "Report a Streetlight Outage" form that can be found here: https://lge-ku.com/outages/report/streetlight

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 26

Responding Witness: N/A

Q-26. [This item intentionally left blank.]

A-26. N/A

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 27

Responding Witness: Daniel K. Arbough

Q-27. For Public Street & Highway Lighting, KU Tab 62 Schedule I-2 shows a 15% increase in revenues from base year to test year. Please elaborate on why the test year increase is considerably higher than the approximately 1.75% increase in overall lighting rates.

A-27. The 15% increase from the base year to the test year is driven primarily by a difference in how actual revenues are recorded by revenue class in the first six months of the base year and how they are forecasted by revenue class in the last six months of the base year and twelve months in the test year. There is no impact to rates as a result of this difference in allocation between revenue classes because rates are designed at the tariff level and not the revenue class level.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 28

Responding Witness: Daniel K. Arbough

Q-28. For Public Street & Highway Lighting, KU Tab 62 Schedule I-2, how much of the $11,423,230 base year revenue is associated with LFUCG accounts? How many of the 807 customers are LFUCG? Why does the number of customers decrease to 413 in the test year?

A-28. LFUCG accounts represented 61.7% of the Public Street & Highway Lighting revenue for the first six months of the base period. The last six months of the base period are based on budgeted street light data, which is not split out by customer. As of January 9, 2021, LFUCG accounted for 293 of the Public Street and Highway Lighting customers. The decrease in the number of customers in the test year is due to a difference in how customer counts are obtained for actual and forecasted periods. Specifically, customer counts are not forecasted for tariffs that do not have a customer charge and forecasted allocations to get revenue from a tariff level to a revenue class level do not always match with how actuals are recorded. There is no impact to rates as a result of these difference

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 29

Responding Witness: John K. Wolfe

Q-29. The highest, by cost and quantity, light in LFUCG's portfolio is RC472. The LED equivalent is the KC2+PK1 light and pole combination. Please confirm this replacement combination and the cost difference that LFUCG will incur as these lights are eventually converted. Will LFUCG pay more or less as the fixtures are converted? Please express the difference in both dollar value and as a percent.

A-29. The recommended comparable LED for RC472 is RC KC2+PK1. The proposed rate for RC472 is $14.59. The proposed rate for RC KC2+PK1 is $16.80 ($4.03+$12.77) for an increase to LFUCG of $2.21(15%) per RC472 fixture per month once converted to LED. If LFUCG elects to convert a RC472 fixture in good working order, LFUCG will pay an additional $7.22 (49%) while paying the proposed conversion fee of $5.01 per month for 5 years.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 30

Responding Witness: Robert M. Conroy

Q-30. Will the monthly LED conversion fee for previously converted LEDs change to the new rate of $5.01per month or remain at $6.03 for the remainder of their 60 month term?

A-30. The monthly LED conversion fee for previously converted LEDs will change to the new rate of $5.01 per month for the remainder of the 60-month term.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 31

Responding Witness: John K. Wolfe

Q-31. Would the Company recognize cost savings if a customer committed to converting large numbers of traditional street lighting to LED street lighting?

A-31. No. Any costs savings are embedded in the LS LED rates and passed through to the customer.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 32

Responding Witness: N/A

Q-32. [This item intentionally left blank.]

A-32. N/A

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 33

Responding Witness: David S. Sinclair

Q-33. The 2021 Business Plan Electric Load Forecast (Tab 16, Item C, p.5-6) indicates 2021BP consumption of 14,635 GWh for R/C/I customers, decreasing at least -500 GWh per year through 2025. The downward trend is not reflected in the R/C/I rates used for capital construction in Tab 26. Please explain why the R/C/I values differ between Tab 16 and Tab 26. Which is considered more reliable as a forecast?

A-33. The 2021 Business Plan Electric Load Forecast (Tab 16, Item C, p.5-6) shows at least a 500 GWh decline plan over plan (2021BP vs. 2020BP) for 2021-2025, not year over year. The chart in Tab 16 is consistent with Tab 26.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 34

Responding Witness: David S. Sinclair

Q-34. Please quantify the contribution of hydro and solar for the years shown in the 2021 Business Plan Generation & OSS Forecast (Tab 16, Item H, p.10). Does the utility have plans to increase renewable energy production beyond 2025 to help achieve the corporate goal of reducing CO2 emissions by 70%, relative to 2005, by 2040 (Thompson testimony, p.19)? If so, please quantify.

A-34. The table below shows actual and forecasted hydro and solar generation from the 2021 Business Plan Generation and OSS Forecast.

GWh	Year	Hydro	Solar
Actual	2016	401	12
	2017	341	17
	2018	347	17
	2019	358	17
6 + 6[1]	2020	384	17
Forecast	2021	390	18
	2022	390	18
	2023	390	18
	2024	390	17
	2025	390	17

As recently approved by the PSC in Case 2020-00016, the Companies plan to purchase approximately 225 GWh per year from a 100 MW solar facility for twenty years starting in 2022, which is not included in the data above. The Companies have also issued a request for proposals for capacity and energy resources, including renewables. The Companies will evaluate these resources based on their ability to provide reliable service to the Companies' customers at the lowest reasonable cost. Any acquisition of additional renewable resources in the Companies' fleet would also serve to reduce CO_2 emissions.

[1] "6+6" indicates that the 2020 total included 6 months of actual data for January through June and 6 months of forecast data for July through December.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 35

Responding Witness: David S. Sinclair

Q-35. Please Refer to Figure 14 in the PPL Corporate Climate Assessment Report, which is identified in footnote 6 of Thompson's testimony. The Figure shows the curve for the Low load forecast. Please provide the LGE/KU Distributed Solar Penetration curve applicable to the Base load forecast, include the numerical values for the years 2020 through 2030.

A-35. See attached.

Year	Month	Distributed Solar Generation (MWh)	Distributed Solar Capacity (MW)	Solar Capacity - Less Degredation (MW)	Effective Capacity Factor	Combined Company Load without Solar (MWh)	Combined Company Load with Distributed Solar (MWh)	Solar as a Percent of Load
2017	1	228	4.69	4.69	6.5%	3,248,929	3,248,701	0.01%
2017	2	345	4.70	4.70	10.9%	2,788,441	2,788,096	0.01%
2017	3	504	4.72	4.71	14.4%	2,688,657	2,688,152	0.02%
2017	4	553	4.73	4.73	16.2%	2,361,424	2,360,871	0.02%
2017	5	665	4.75	4.74	18.8%	2,666,287	2,665,622	0.02%
2017	6	676	4.76	4.75	19.7%	3,075,965	3,075,289	0.02%
2017	7	675	4.78	4.76	19.0%	3,286,045	3,285,369	0.02%
2017	8	661	4.79	4.78	18.5%	3,363,993	3,363,333	0.02%
2017	9	587	4.80	4.79	17.0%	2,690,540	2,689,953	0.02%
2017	10	501	4.82	4.80	14.0%	2,460,037	2,459,536	0.02%
2017	11	377	4.83	4.81	10.8%	2,636,744	2,636,367	0.01%
2017	12	274	4.85	4.82	7.6%	3,036,033	3,035,758	0.01%
2018	1	279	5.76	5.74	6.5%	3,258,207	3,257,928	0.01%
2018	2	427	5.80	5.77	11.0%	2,789,852	2,789,425	0.02%
2018	3	621	5.83	5.80	14.3%	2,670,904	2,670,283	0.02%
2018	4	683	5.87	5.84	16.2%	2,355,561	2,354,878	0.03%
2018	5	824	5.91	5.87	18.8%	2,680,395	2,679,570	0.03%
2018	6	840	5.94	5.91	19.6%	3,092,532	3,091,691	0.03%
2018	7	843	5.98	5.94	18.9%	3,297,621	3,296,778	0.03%
2018	8	827	6.02	5.98	18.5%	3,358,334	3,357,507	0.02%
2018	9	737	6.05	6.01	16.9%	2,696,655	2,695,918	0.03%
2018	10	631	6.09	6.04	13.9%	2,462,240	2,461,610	0.03%
2018	11	476	6.13	6.08	10.8%	2,621,075	2,620,599	0.02%
2018	12	348	6.16	6.11	7.6%	3,039,704	3,039,356	0.01%
2019	1	428	8.85	8.80	6.5%	3,252,953	3,252,525	0.01%
2019	2	654	8.89	8.83	10.9%	2,785,116	2,784,462	0.02%
2019	3	948	8.93	8.87	14.3%	2,667,337	2,666,388	0.04%
2019	4	1,041	8.96	8.90	16.1%	2,352,609	2,351,568	0.04%
2019	5	1,254	9.00	8.93	18.7%	2,563,540	2,562,286	0.05%
2019	6	1,276	9.04	8.97	19.6%	2,962,006	2,960,731	0.04%
2019	7	1,276	9.08	9.00	18.9%	3,151,107	3,149,830	0.04%
2019	8	1,249	9.11	9.03	18.4%	3,214,212	3,212,963	0.04%
2019	9	1,112	9.15	9.07	16.9%	2,578,141	2,577,029	0.04%
2019	10	949	9.19	9.10	13.9%	2,350,089	2,349,140	0.04%
2019	11	715	9.22	9.13	10.8%	2,502,397	2,501,682	0.03%
2019	12	521	9.26	9.16	7.6%	2,900,236	2,899,715	0.02%
2020	1	578	11.98	11.88	6.5%	3,114,225	3,113,648	0.02%
2020	2	881	12.01	11.91	10.9%	2,648,691	2,571,798	0.03%
2020	3	1,277	12.05	11.94	14.2%	2,547,807	2,546,530	0.05%
2020	4	1,399	12.08	11.96	16.1%	2,249,853	2,248,453	0.06%
2020	5	1,683	12.11	11.99	18.7%	2,564,517	2,562,834	0.07%
2020	6	1,709	12.14	12.02	19.6%	2,962,370	2,960,661	0.06%
2020	7	1,708	12.17	12.04	18.9%	3,150,882	3,149,174	0.05%
2020	8	1,669	12.20	12.07	18.4%	3,213,788	3,212,118	0.05%
2020	9	1,483	12.23	12.09	16.8%	2,577,870	2,576,387	0.06%
2020	10	1,265	12.26	12.12	13.9%	2,350,218	2,348,954	0.05%
2020	11	952	12.29	12.15	10.7%	2,503,089	2,502,138	0.04%
2020	12	692	12.33	12.17	7.5%	2,900,801	2,900,108	0.02%
2021	1	702	14.60	14.44	6.5%	3,104,907	3,104,205	0.02%

Year	Month	Distributed Solar Generation (MWh)	Distributed Solar Capacity (MW)	Solar Capacity - Less Degredation (MW)	Effective Capacity Factor	Combined Company Load without Solar (MWh)	Combined Company Load with Distributed Solar (MWh)	Solar as a Percent of Load
2021	2	1,071	14.63	14.47	10.9%	2,656,238	2,655,167	0.04%
2021	3	1,550	14.67	14.49	14.2%	2,540,258	2,538,708	0.06%
2021	4	1,698	14.70	14.52	16.1%	2,244,012	2,242,314	0.08%
2021	5	2,042	14.73	14.55	18.6%	2,557,509	2,555,467	0.08%
2021	6	2,073	14.76	14.57	19.5%	2,953,331	2,951,258	0.07%
2021	7	2,070	14.79	14.60	18.8%	3,140,555	3,138,486	0.07%
2021	8	2,022	14.82	14.62	18.3%	3,203,178	3,201,156	0.06%
2021	9	1,796	14.85	14.65	16.8%	2,569,897	2,568,101	0.07%
2021	10	1,531	14.88	14.67	13.8%	2,343,483	2,341,952	0.07%
2021	11	1,151	14.91	14.70	10.7%	2,496,109	2,494,958	0.05%
2021	12	837	14.95	14.72	7.5%	2,892,108	2,891,271	0.03%
2022	1	817	17.04	16.81	6.4%	3,104,612	3,103,795	0.03%
2022	2	1,248	17.10	16.87	10.9%	2,655,442	2,654,194	0.05%
2022	3	1,810	17.17	16.92	14.2%	2,539,783	2,537,973	0.07%
2022	4	1,985	17.23	16.97	16.0%	2,243,897	2,241,912	0.09%
2022	5	2,390	17.29	17.03	18.6%	2,557,005	2,554,615	0.09%
2022	6	2,430	17.35	17.08	19.5%	2,952,225	2,949,795	0.08%
2022	7	2,430	17.41	17.14	18.8%	3,138,994	3,136,564	0.08%
2022	8	2,378	17.47	17.19	18.3%	3,201,527	3,199,149	0.07%
2022	9	2,114	17.53	17.24	16.8%	2,568,603	2,566,488	0.08%
2022	10	1,805	17.59	17.30	13.8%	2,342,660	2,340,856	0.08%
2022	11	1,359	17.65	17.35	10.7%	2,495,730	2,494,371	0.05%
2022	12	990	17.72	17.41	7.5%	2,891,442	2,890,452	0.03%
2023	1	1,062	22.17	21.85	6.4%	3,106,839	3,105,777	0.03%
2023	2	1,609	22.23	21.90	10.8%	2,656,827	2,655,218	0.06%
2023	3	2,348	22.29	21.96	14.2%	2,541,526	2,539,178	0.09%
2023	4	2,574	22.35	22.01	16.0%	2,245,651	2,243,077	0.11%
2023	5	3,097	22.41	22.06	18.6%	2,558,824	2,555,728	0.12%
2023	6	3,146	22.47	22.11	19.4%	2,953,772	2,950,626	0.11%
2023	7	3,143	22.54	22.16	18.7%	3,140,361	3,137,218	0.10%
2023	8	3,073	22.60	22.21	18.3%	3,202,824	3,199,751	0.10%
2023	9	2,730	22.66	22.27	16.7%	2,569,650	2,566,920	0.11%
2023	10	2,329	22.72	22.32	13.8%	2,344,035	2,341,707	0.10%
2023	11	1,752	22.78	22.37	10.7%	2,497,599	2,495,846	0.07%
2023	12	1,275	22.84	22.42	7.5%	2,893,688	2,892,413	0.04%
2024	1	1,293	27.03	26.60	6.4%	3,116,236	3,114,943	0.04%
2024	2	1,975	27.13	26.70	10.8%	2,648,211	2,569,940	0.08%
2024	3	2,865	27.24	26.79	14.1%	2,548,802	2,545,937	0.11%
2024	4	3,144	27.34	26.88	16.0%	2,251,960	2,248,816	0.14%
2024	5	3,787	27.45	26.98	18.5%	2,565,718	2,561,931	0.15%
2024	6	3,851	27.55	27.07	19.4%	2,961,536	2,957,684	0.13%
2024	7	3,852	27.66	27.17	18.7%	3,148,534	3,144,682	0.12%
2024	8	3,771	27.77	27.26	18.3%	3,211,051	3,207,280	0.12%
2024	9	3,354	27.87	27.35	16.7%	2,575,966	2,572,612	0.13%
2024	10	2,864	27.98	27.45	13.8%	2,349,883	2,347,020	0.12%
2024	11	2,158	28.08	27.54	10.7%	2,504,556	2,502,398	0.09%
2024	12	1,571	28.19	27.63	7.5%	2,902,321	2,900,749	0.05%
2025	1	1,715	35.86	35.30	6.4%	3,118,982	3,117,266	0.06%
2025	2	2,619	35.97	35.39	10.8%	2,650,213	2,647,594	0.10%

Year	Month	Distributed Solar Generation (MWh)	Distributed Solar Capacity (MW)	Solar Capacity - Less Degredation (MW)	Effective Capacity Factor	Combined Company Load without Solar (MWh)	Combined Company Load with Distributed Solar (MWh)	Solar as a Percent of Load
2025	3	3,795	36.07	35.48	14.1%	2,551,049	2,547,254	0.15%
2025	4	4,161	36.18	35.57	16.0%	2,254,362	2,250,201	0.18%
2025	5	5,006	36.28	35.66	18.5%	2,568,017	2,563,011	0.20%
2025	6	5,086	36.39	35.75	19.4%	2,963,479	2,958,393	0.17%
2025	7	5,083	36.50	35.84	18.7%	3,149,927	3,144,844	0.16%
2025	8	4,971	36.60	35.93	18.3%	3,212,418	3,207,447	0.15%
2025	9	4,417	36.71	36.02	16.7%	2,577,272	2,572,855	0.17%
2025	10	3,768	36.81	36.11	13.8%	2,351,743	2,347,975	0.16%
2025	11	2,836	36.92	36.20	10.7%	2,507,043	2,504,207	0.11%
2025	12	2,064	37.02	36.29	7.5%	2,905,118	2,903,054	0.07%
2026	1	2,116	44.29	43.55	6.4%	3,116,561	3,114,445	0.07%
2026	2	3,234	44.47	43.71	10.8%	2,663,664	2,660,430	0.12%
2026	3	4,691	44.64	43.86	14.1%	2,549,676	2,544,985	0.18%
2026	4	5,148	44.81	44.01	16.0%	2,253,605	2,248,456	0.23%
2026	5	6,200	44.98	44.17	18.5%	2,566,871	2,560,671	0.24%
2026	6	6,306	45.16	44.32	19.4%	2,960,973	2,954,668	0.21%
2026	7	6,308	45.33	44.48	18.7%	3,146,216	3,139,909	0.20%
2026	8	6,174	45.50	44.63	18.2%	3,208,506	3,202,332	0.19%
2026	9	5,492	45.68	44.79	16.7%	2,574,460	2,568,968	0.21%
2026	10	4,689	45.85	44.94	13.7%	2,350,050	2,345,361	0.20%
2026	11	3,533	46.02	45.10	10.7%	2,505,687	2,502,154	0.14%
2026	12	2,573	46.19	45.25	7.5%	2,902,982	2,900,409	0.09%
2027	1	2,811	58.82	57.85	6.4%	3,120,263	3,117,452	0.09%
2027	2	4,292	58.99	58.00	10.8%	2,666,538	2,662,247	0.16%
2027	3	6,220	59.16	58.15	14.1%	2,552,784	2,546,564	0.24%
2027	4	6,819	59.34	58.30	16.0%	2,256,757	2,249,938	0.30%
2027	5	8,205	59.51	58.45	18.5%	2,570,136	2,561,931	0.32%
2027	6	8,336	59.68	58.60	19.4%	2,963,848	2,955,512	0.28%
2027	7	8,331	59.86	58.75	18.7%	3,148,504	3,140,173	0.27%
2027	8	8,147	60.03	58.89	18.2%	3,210,672	3,202,525	0.25%
2027	9	7,240	60.20	59.04	16.7%	2,576,337	2,569,098	0.28%
2027	10	6,175	60.37	59.19	13.7%	2,352,516	2,346,340	0.26%
2027	11	4,649	60.55	59.34	10.7%	2,508,755	2,504,106	0.19%
2027	12	3,383	60.72	59.49	7.5%	2,906,645	2,903,262	0.12%
2028	1	3,474	72.75	71.49	6.4%	3,130,833	3,127,359	0.11%
2028	2	5,308	73.02	71.73	10.8%	2,658,960	2,563,045	0.21%
2028	3	7,698	73.29	71.98	14.1%	2,561,206	2,553,508	0.30%
2028	4	8,447	73.57	72.22	15.9%	2,264,193	2,255,746	0.37%
2028	5	10,172	73.84	72.46	18.5%	2,578,352	2,568,180	0.40%
2028	6	10,343	74.11	72.70	19.4%	2,972,614	2,962,271	0.35%
2028	7	10,344	74.38	72.94	18.7%	3,157,304	3,146,960	0.33%
2028	8	10,123	74.65	73.18	18.2%	3,219,510	3,209,387	0.32%
2028	9	9,003	74.92	73.42	16.7%	2,583,249	2,574,245	0.35%
2028	10	7,686	75.20	73.67	13.7%	2,359,476	2,351,790	0.33%
2028	11	5,790	75.47	73.91	10.7%	2,517,023	2,511,233	0.23%
2028	12	4,216	75.74	74.15	7.5%	2,916,488	2,912,272	0.14%
2029	1	4,565	95.57	93.95	6.4%	3,129,249	3,124,683	0.15%
2029	2	6,968	95.84	94.18	10.8%	2,673,574	2,666,606	0.26%
2029	3	10,098	96.11	94.41	14.1%	2,560,316	2,550,218	0.40%

Year	Month	Distributed Solar Generation (MWh)	Distributed Solar Capacity (MW)	Solar Capacity - Less Degredation (MW)	Effective Capacity Factor	Combined Company Load without Solar (MWh)	Combined Company Load with Distributed Solar (MWh)	Solar as a Percent of Load
2029	4	11,070	96.39	94.65	16.0%	2,264,110	2,253,040	0.49%
2029	5	13,319	96.66	94.88	18.5%	2,578,239	2,564,920	0.52%
2029	6	13,531	96.93	95.11	19.4%	2,971,082	2,957,551	0.46%
2029	7	13,521	97.20	95.34	18.7%	3,154,595	3,141,075	0.43%
2029	8	13,220	97.47	95.57	18.2%	3,216,576	3,203,356	0.41%
2029	9	11,748	97.74	95.81	16.7%	2,581,236	2,569,489	0.46%
2029	10	10,020	98.02	96.04	13.7%	2,358,800	2,348,780	0.43%
2029	11	7,542	98.29	96.27	10.7%	2,516,609	2,509,067	0.30%
2029	12	5,487	98.56	96.50	7.5%	2,915,504	2,910,017	0.19%
2030	1	5,611	117.55	115.46	6.4%	3,131,532	3,125,921	0.18%
2030	2	8,569	117.97	115.82	10.8%	2,675,193	2,666,624	0.32%
2030	3	12,426	118.38	116.18	14.1%	2,562,488	2,550,062	0.49%
2030	4	13,632	118.79	116.54	15.9%	2,266,576	2,252,944	0.61%
2030	5	16,411	119.20	116.91	18.5%	2,580,789	2,564,378	0.64%
2030	6	16,683	119.61	117.27	19.4%	2,972,816	2,956,133	0.56%
2030	7	16,682	120.02	117.63	18.7%	3,155,421	3,138,739	0.53%
2030	8	16,322	120.43	117.99	18.2%	3,217,252	3,200,930	0.51%
2030	9	14,513	120.84	118.35	16.7%	2,582,157	2,567,645	0.57%
2030	10	12,386	121.25	118.72	13.7%	2,360,596	2,348,210	0.53%
2030	11	9,329	121.66	119.08	10.6%	2,518,937	2,509,609	0.37%
2030	12	6,792	122.07	119.44	7.5%	2,917,920	2,911,129	0.23%

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 36

Responding Witness: David S. Sinclair

Q-36. Did the utility conduct a literature review of studies seeking to evaluate the impact of distributed generation on peak day loading from jurisdictions having measurable solar market penetration?

A-36. The Companies have not done a formal literature review on this topic. However, the Companies do follow this topic closely. For example, the Companies recently discussed this topic with another utility with a higher penetration of distributed solar, both in terms of number of installations and installed capacity, in their service territory.

Additionally, the Companies seek out studies from other utilities, private consultants, government agencies, and academic institutions on a broad range of topics. The Company reviews literature not only on the impact of distributed generation on peak day loading from jurisdictions having measurable solar market penetration, but also the impact of renewables on many other aspects of utility operations throughout the U.S.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 37

Responding Witness: Robert M. Conroy / Eileen L. Saunders

Q-37. Under how many different types of customer rate codes does the LFUCG currently make payments to KU? For each type of class, please provide the following information:

a. The type of customer rate code;

b. The number of LFUCG accounts in each such rate code;

c. The total amount paid by the LFUCG for each such rate code during the last 12 month period; and

d. The total net projected impact for each such rate code under the proposed rate increase.

A-37.

a. See attached.

b. See attached.

c. See attached.

d. The Company has not performed the specific calculation for each of the LFUCG accounts. See Schedule M-2.3 at Tab 66 of the filing requirement for the proposed increase for each rate class.

LFUCG
January 2020 through December 2020

	Part A		Part B	Part C	
Account Class	**Rate Code**	**Rate Description**	**Count of Contract Accounts***	**Total 12 Months Ending December 2020**	
Commercial	110	GS Single Phase - Commercial	51	$	108,896
	113	GS Three Phase - Commercial	53	$	270,576
	295	Traffic Energy (Metered)	127	$	30,488
	297	Traffic Energy (Wi-Fi Receiver)	6	$	671
	404	RLS 404: OH MV Open Bottom 7000L Fix	3	$	642
	413	RLS 413: UG HPS Coach 9500L Decorativ	1	$	18,013
	428	RLS 428: OH HPS Open Bottom 9500L Fi	1	$	122
	430	RLS 430: UG HPS Acorn 9500L Historic	2	$	9,251
	450	RLS 450: OH MH Directional 12000L Fix	4	$	1,251
	451	RLS 451: OH MH Directional 32000L Fix	3	$	1,735
	454	RLS 454: OH MH Directional 12000L Fix/	1	$	869
	460	RLS 460: UG MH Directional 12000L Dec	2	$	4,318
	464	RLS 464: OH HPS Cobra Head 22000L Fix	3	$	917
	469	RLS 469: UG MH Directional 32000L Dec	1	$	2,024
	477	RLS 477: UG HPS Contemporary 9500L D	1	$	2,304
	487	RLS 487: OH HPS Directional 9500L Fix	2	$	127
	488	RLS 488: OH HPS Directional 22000L Fix	4	$	1,097
	489	RLS 489: OH HPS Directional 50000L Fix	5	$	2,979
	490	RLS 490: UG MH Contemporary 12000L F	2	$	5,107
	494	RLS 494: UG MH Contemporary 12000L I	3	$	14,373
	562	PS Secondary - Commercial	6	$	220,366
	572	TODS - Commercial	3	$	484,919
	828	Excess Facilities ODL	6	$	296

LFUCG
January 2020 through December 2020

	Part A		Part B	Part C	
Account Class	**Rate Code**	**Rate Description**	**Count of Contract Accounts***	**Total 12 Months Ending December 2020**	
Commercial Total			**259**	**$**	**1,181,340**
Public Authorities	010	Residential Service	1	$	1,364
	020	Residential Service - All Electric	2	$	2,798
	110	GS Single Phase - Commercial	136	$	377,369
	113	GS Three Phase - Commercial	71	$	415,573
		GS Three Phase - Industrial, DSM	1	$	-
	290	Lighting Energy (Metered)	1	$	981
	291	Lighting Energy (Burning Hours)	1	$	11,629
	295	Traffic Energy (Metered)	334	$	76,564
	390	LS 390: OH LED Cobra Head 8179L Fixtu	1	$	6,872
	391	LS 391: OH LED Cobra Head 14166L Fixt	2	$	3,507
	392	LS 392: OH LED Cobra Head 23214L Fixt	2	$	3,734
	393	LS 393: OH LED Open Bottom 5007L Fixt	5	$	741
	396	LS 396: UG LED Cobra Head 8179L Dec S	1	$	11,256
	397	LS 397: UG LED Cobra Head 14166L Fixt	1	$	53,299
	398	LS 398: UG LED Cobra Head 23214L Fixt	1	$	4,016
	399	LS 399: UG LED Colonial 5665L Decorati	1	$	153
	404	RLS 404: OH MV Open Bottom 7000L Fix	17	$	5,246
	420	RLS 420: UG HPS Acorn 9500L Decorativ	4	$	18,481
	428	RLS 428: OH HPS Open Bottom 9500L Fi	13	$	2,384
	430	RLS 430: UG HPS Acorn 9500L Historic	3	$	22,227
	447	RLS 447: OH MV Cobra Head 10000L Fix	1	$	79,767
	448	RLS 448: OH MV Cobra Head 20000L Fix	1	$	31,109

LFUCG
January 2020 through December 2020

	Part A		Part B	Part C	
Account Class	Rate Code	Rate Description	Count of Contract Accounts*	Total 12 Months Ending December 2020	
	450	RLS 450: OH MH Directional 12000L Fix	2	$	1,215
	451	RLS 451: OH MH Directional 32000L Fix	11	$	10,897
	452	RLS 452: OH MH Directional 107800L Fix	1	$	637
	455	RLS 455: OH MH Directional 32000L Fix/	1	$	378
	457	RLS 457: OH MV Cobra 10000L Fixture/P	2	$	58,568
	458	RLS 458: OH MV Cobra 20000L Fixture/P	2	$	84,943
	461	RLS 461: OH HPS Cobra Head 4000L Fixt	1	$	63,663
	462	RLS 462: OH HPS Cobra Head 5800L Fixt	1	$	221,756
	463	RLS 463: OH HPS Cobra Head 9500L Fixt	1	$	157,181
	464	RLS 464: OH HPS Cobra Head 22000L Fix	4	$	147,139
	465	RLS 465: OH HPS Cobra Head 50000L Fix	4	$	59,566
	466	RLS 466: UG HPS Colonial 4000L Deco	1	$	13,567
	467	RLS 467: UG HPS Colonial 5800L Deco	2	$	33,566
	468	RLS 468: UG HPS Colonial 9500L Deco	1	$	57,859
	469	RLS 469: UG MH Directional 32000L Dec	4	$	14,204
	471	RLS 471: OH HPS Cobra Hd 4000L Fix/Pc	2	$	524,956
	472	RLS 472: OH HPS Cobra 5800L Ornament	2	$	1,693,860
	473	RLS 473: OH HPS Cobra 9500L Ornament	2	$	376,374
	474	RLS 474: OH HPS Cobra 22000L Ornamer	2	$	893,975
	475	RLS 475: OH HPS Cobra 50000L Ornamer	2	$	96,902
	476	RLS 476: UG HPS Contemporary 5800L D	2	$	1,269,909
	477	RLS 477: UG HPS Contemporary 9500L D	2	$	8,563
	478	RLS 478: UG HPS Contemporary 22000L I	7	$	267,328

LFUCG
January 2020 through December 2020

	Part A		Part B	Part C
Account Class	Rate Code	Rate Description	Count of Contract Accounts*	Total 12 Months Ending December 2020
	479	RLS 479: UG HPS Contemporary 50000L I	2	$ 40,558
	487	RLS 487: OH HPS Directional 9500L Fix	11	$ 2,625
	488	RLS 488: OH HPS Directional 22000L Fix	14	$ 4,841
	489	RLS 489: OH HPS Directional 50000L Fix	20	$ 25,555
	490	RLS 490: UG MH Contemporary 12000L F	1	$ 1,216
	494	RLS 494: UG MH Contemporary 12000L I	4	$ 28,712
	495	RLS 495: UG MH Contemporary 32000L I	2	$ 12,761
	499	RLS 499: UG HPS Contemporary 50000L I	1	$ 325
	561	PS Primary - Industrial, DSM	1	$ 10,900
	562	PS Secondary - Commercial	18	$ 695,822
	568	PS Secondary PF Adj - Commercial	3	$ 225,362
	571	TODP - Commercial	2	$ 1,507,418
	572	TODS - Commercial	13	$ 1,395,696
	826	Electric Excess Facilities CIAC	2	$ 9,909
	828	Excess Facilities ODL	24	$ 6,135
	KC1	LS KC1: OH LED Cobra Head	1	$ 10,309
	KC2	LS KC2: UG LED Cobra Head	1	$ 12,249
	KF1	LS KF1: OH LED Directional (Flood)	2	$ 124
	KF3	LS KF3: OH LED Directional (Flood)	5	$ 946
	KF4	LS KF4: OH LED Directional (Flood)	1	$ 579
	KN1	LS KN1: UG LED Contemporary	1	$ 16,887
	KN2	LS KN2: UG LED Contemporary	2	$ 5,561
	KN3	LS KN3: UG LED Contemporary	2	$ 1,867

LFUCG
January 2020 through December 2020

	Part A		Part B	Part C	
Account Class	**Rate Code**	**Rate Description**	**Count of Contract Accounts***		**Total 12 Months Ending December 2020**
	KN4	LS KN4: UG LED Contemporary	1	$	488
Public Authorities Total			**654**	**$**	**11,202,923**
Residential	297	Traffic Energy (Wi-Fi Receiver)	266	$	29,750
	404	RLS 404: OH MV Open Bottom 7000L Fix	1	$	160
	468	RLS 468: UG HPS Colonial 9500L Deco	1	$	2,404
	477	RLS 477: UG HPS Contemporary 9500L D	1	$	156,268
	488	RLS 488: OH HPS Directional 22000L Fix	1	$	422
Residential Total			**270**	**$**	**189,005**
Grand Total			**1,183**	**$**	**12,573,267**

*Note that totals do not sum and count unique contract accounts. A contract account include multiple rate codes and change rate code and/or account class over time.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 38

Responding Witness: Robert M. Conroy

Q-38. For each separate LFUCG account please provide a detailed analysis showing the impact of the proposed rate versus the existing rate using the most recent 12 month actual usage and billing data. Please also provide a detailed explanation of the formula that was used to obtain this information. In particular, please show the formula or calculations indicating the total fiscal impact, including the application of the fees and all applicable adjustments (Environmental, DSM, Fuel, etc.).

A-38. The Company has not performed the specific calculation for each of the LFUCG accounts. See Schedule M-2.3 at Tab 66 of the filing requirements for the proposed increase for each rate class.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 39

Responding Witness: Eileen L. Saunders

Q-39. Please provide a schedule showing the following information for each current LFUCG account for 2018, for 2019 and the first 10 months of 2020 separately by year and not added together.

a. Applicable tariff.

b. Other tariffs that could be applicable to this account.

c. Total sum paid.

A-39. See attached. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection. Subpart b does not apply, as all customer accounts are currently on their correct rate.

The entire attachment is Confidential and provided separately under seal.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 40

Responding Witness: Christopher M. Garrett

Q-40. Does KU have an estimate or general or specific information on how much revenue is derived from Fayette County customers? If so, please provide by customer class for each of the last three years as well as a comparison of the percentage of revenue that this constitutes in relation to all revenues.

A-40. See attached.

Kentucky Utilities Company
Case No. 2020-00349

Fayette County Billed Revenue by Customer Class
For the Calendar Years 2018 through 2020

Line No.	Item (a)	12 Months Ended Three Most Recent Calendar Years 2018 (b)	2019 (c)	2020 (d)
1.	Fayette County Revenue			
2.	Residential Customers	$ 176,685,770	$ 174,187,260	$ 175,298,731
3.	Commercial Customers	128,005,685	142,340,566	134,363,828
4.	Industrial Customers	31,237,690	19,678,324	20,710,260
5.	Public Authorities Customers	39,895,518	40,188,854	38,220,857
6.	Street Lights Customers	5,904,576	6,069,420	6,173,875
7.	Total (L2 through L6)	$ 381,729,239	$ 382,464,424	$ 374,767,551
8.	Total Operating Revenue	$ 1,759,605,385	$ 1,739,801,102	$ 1,690,963,437
9.	Fayette County Percentage of Revenue	21.69%	21.98%	22.16%

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 41

Responding Witness: Robert M. Conroy

Q-41. Please state whether the LFUCG's franchise fee applies to all tariffs for services provided in Fayette County? If not, please identify each tariff for which the franchise fee does not apply.

A-41. See the tariffs filed at Tab 4 of the Filing Requirements for current and proposed applicability of the franchise fee to each rate schedule.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 42

Responding Witness: Lonnie E. Bellar

Q-42. Please refer to Bellar testimony, page 55, Line 20, regarding "Status Quo alternative which assumes replacing existing meters as they fail with non-communicating electronic meters." Describe:

a. What is failure rate of current meters?

b. When does the Company believe the current meters in use would be completely replaced by the "non – communicating electronic meters"?

c. In detail, what type of "non-communicating electronic" meters would be used?

d. Explain why the Company cannot replace the existing meters, as they fail, with AMI meters?

A-42.

a. Meter failure rates are a function of age and can be found in Table 2 of the Meter Life Study in Exhibit LEB-3, Appendix C.

b. The Companies' electric meters primarily consist of non-communicating electromechanical and non-communicating electronic meters. In the Status Quo, the Companies replace non-communicating electromechanical and non-communicating electronic meters as they fail with non-communicating electronic meters. As stated in the Meter Life Study, the last new electromechanical meters were installed in 2008, and electromechanical meters can last up to 70 years. Therefore, electromechanical meters may not be fully replaced until as late as 2078.

c. These are traditional solid-state electronic meters which do not have communication modules (e.g., Encoder Receiver Transmitter modules, Power Line Carrier modules, RF mesh modules, or cellular modules).

d. If granted approval by the Commission, the Companies can replace existing meters as they fail with AMI meters. The Companies evaluated this Replace-

As-Meters-Fail alternative in Section 5.2 of Exhibit LEB-3 and found that doing so resulted in a higher cost compared to the proposed AMI project implementation timeline.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 43

Responding Witness: Lonnie E. Bellar

Q-43. Refer to Exhibit LEB-3. Does the Status Quo scenario include costs already embedded in existing rates? For example, Table 4 identifies costs associated with meter reading and field service, yet these costs are generally associated with customer base charges.

A-43. Yes. The analysis summarized in Exhibit LEB-3 evaluated all relevant costs for each alternative.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 44

Responding Witness: John K. Wolfe

Q-44. Refer to Exhibit LEB-3, Appendix D. LFUCG has experienced some equipment problems attributed to off-normal voltage conditions. With regards to Conservation Voltage Reduction potential, will additional support be available for customers to diagnose issues with the utility? If problems are encountered, will the utility disable "dynamic" CVR to address end-use compatibility problems?

A-44. AMI meters will be configured to record and provide voltage information to the Companies. This information, in addition to other data collected from devices across the distribution system apart from the proposed AMI project, will provide the Companies with detailed information to assist in diagnosing voltage issues at the Company-customer connection point and across the distribution system.

Customer reliability and electrical service quality is very important to the Company. For certain situations as problems are encountered or reported, the utility will be able to disable CVR for these select areas until the problems can be resolved.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 45

Responding Witness: John K. Wolfe

Q-45. Would Conservation Voltage Reduction ever be used to increase voltage within the tolerance band?

A-45. Conservative Voltage Reduction, by itself, would not be used to increase voltage for customers. The equipment deployed as part of a Volt/Var Optimization program that enables Conservative Voltage Reduction may increase the voltage within the tolerance band depending on the voltage profile of the circuit to keep customers above the minimum limit.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 46

Responding Witness: Kent W. Blake

Q-46. Please refer to Blake testimony on Page 16, line 19, regarding "The Companies would expect to use the amortization of the regulatory assets and liabilities associated with the AMI project to address this up-front cost and long-term benefit issue such that customers would never see an increase in revenue requirements associated with implementing AMI" and Exhibit KWB-2.

a. Does page 2 of Exhibit KWB-2 reflect the 15-year allocation of the AMI costs pursuant to the statement beginning on page 16, line 9?

b. Would the rate impact of this allocation be zero, or even positive for ratepayers, because of this allocation?

c. What, specifically, would the rate impact of this allocation be for Residential, Consumer, industrial, lighting for each year between 2026 and 2046?

d. If the answer to c indicates any increase rate in any year for any class, how does that comport with the statement that "customers would never see an increase in revenue requirements"?

e. How are customers protected against rate increases if actual costs come in above the expectations shown in Exhibits KWB-1 and KWB-2?

f. Is the Company willing to accept in the CPCN case that there will be no rate impact to the AMI proposal?

g. If there is no revenue requirement or rate impact to the AMI project, why are the companies seeking a CPCN?

A-46.

a. The rows labeled "Regulatory Asset Amortization" and "Regulatory Liability Amortization" on page 2 of Exhibit KWB-2 reflect the concepts from page 16, line 19 assuming the AMI meters are depreciated over a 15-year life.

b. The impact to the Companies' combined revenue requirement of the AMI project relative to the status quo is shown in the last row of Exhibit KWB-2 (page 2 for a 15-year meter life and page 3 for a 20-year meter life). It does show either zero impact or a positive impact for every year shown.

c. The Companies have not performed a 20-year cost of service study to assess how the components of the changes to the Companies' combined revenue requirement under AMI would be allocated across customer classes. However, as noted in b above, the combined revenue requirement impact is shown as zero.

d. N/A

e. The deployment of AMI is no different than any other capital project. The decision is made with the best available information at the time of the decision. Unforeseen costs or benefits are always possible with any major investment decision. However, the analysis summarized in Exhibit LEB-3 demonstrates that the downside risk associated with the AMI proposal is very low. Furthermore, the Companies are deferring all cost recovery on the project until it is complete and implementation costs are known.

   As stated in the Blake testimony at page 3, lines 5-8, the Companies have sought thoughtful ways to "provide for cost recovery of the Companies' proposed AMI investment in a manner which, based on the Companies' current projections, will not result in an increase in our customers' rates currently or when cost recovery of that investment is ultimately sought." Finally, the Commission retains its full ratemaking power under KRS Chapter 278 to approve, deny, or modify the Companies' rates in the future.

f. See the response to part (e).

g. The Companies are seeking a CPCN for the proposed AMI project because it is required.

   Kentucky statute and regulation require a utility to obtain a CPCN when a proposed construction project is not an "ordinary extension[] of existing systems in the usual course of business."[2] The Commission has defined an "ordinary extension" as "facilities that do not result in the wasteful duplication of utility plant, do not compete with the facilities of existing public utilities, and do not involve a sufficient capital outlay to materially affect the existing financial condition of the utility involved or to require an increase in utility rates."[3] Although the proposed AMI project will not result in wasteful

[2] KRS 278.020(1). *See also* 807 KAR 5:001, Section 15(3).

[3] The Application of Northern Kentucky Water District (A) For Authority to Issue Parity Revenue Bonds in the Approximate Amount of $16,545,000; and (B) A Certificate of Public Convenience and

duplication of utility plant and will not compete with the facilities of existing public utilities, the proposed AMI project will involve a sufficient capital outlay – approximately $302.5 million.

Most recently, the Commission issued Orders in the Companies' 2020 ECR cases that state "The Commission finds that, until further Order of the Commission, any capital expenditure that exceeds $100 million will be considered material to [KU's] [LG&E's] financial position and will require a CPCN."[4] Because the projected cost of AMI implementation is more than three times the threshold amount announced in the Order, the project cost is considered material.

Additionally, the Commission has held that certain projects, such as smart grid deployments,[5] as a matter of policy generally require a CPCN even if the project cost would not otherwise be considered material.

Necessity for the Construction of Water Main Facilities, Case No. 2000-00481, Order at 4 (Ky. PSC Aug. 30, 2001).

[4] *Electronic Application of Kentucky Utilities Company for Approval of Its 2020 Compliance Plan for Recovery by Environmental Surcharge*, Case No. 2020-00060, Order at 13 (Ky. PSC Sept. 29, 2020); *Electronic Application of Louisville Gas and Electric Company for Approval of an Amended Environmental Compliance Plan and a Revised Environmental Surcharge*, Case No. 2020-00061, Order at 13 (Ky. PSC Sept. 29, 2020).

[5] *Consideration of the Implementation of Smart Grid and Smart Meter Technologies*, Case No. 2012-00428, Order at 11 (Ky. PSC Apr. 13, 2016).

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 47

Responding Witness: Eileen L. Saunders

Q-47. Regarding the new AMI Meters proposed in the CPCN.

a. How long have these meters been in use?

b. What other utilities have used them?

c. What is the failure rate of the proposed new AMI meters?

d. Does the company that provides these meters warrant their operations? For how long?

e. What are replacement costs of these new meters?

f. What network communications protocols do these proposed new meters use?

A-47.

a. At LG&E these meters have been in use for 10 years in the downtown network. Landis + Gyr is a global supplier of these meters. Landis + Gyr introduced the FOCUS AX-SD meter in 2007.

b. See attached. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

c. See the response to Question No. 42(a). As stated in Section 3 of Exhibit LEB-3, AMI meters are assumed to have the same failure rates as non-communicating electronic meters.

d. Yes, Landis + Gyr provided a 5-year warranty for the meters

e. See Table 15 in Section 6.1.2 of Exhibit LEB-3.

f. The meters use 900 MHz unlicensed spectrum for communications from the meter to a collector. The collector uses fiber or public data network to communicate to Command Center.

The entire attachment is Confidential and provided separately under seal.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 48

Responding Witness: Eileen L. Saunders

Q-48. Will the proposed AMI meters use capacitor or battery technology as a backup power source to support communication reporting during outages?

a. What is the anticipated time the backup power source will be able to report?

b. What is the anticipated life expectancy of the capacitor or battery?

c. Has this proposal included maintenance or replacement costs for this critical piece of the infrastructure?

d. What backup power sources will be utilized for the other critical points in the communications network, at the transformers, repeaters, sub-stations, etc?

e. Has maintenance and lifecycle replacement costs for the backup power components been included in your proposal, if so please indicate where and how much?

A-48. The proposed AMI electric meters use a capacitor as a backup power source.

a. Approximately 1.5 minutes.

b. 20 years.

c. Yes. When this component fails, the entire meter has to be replaced.

d. The collectors in the communications network feature battery backup.

e. Yes, the maintenance and lifecycle replacement costs for backup power components are included as part of the ongoing costs related to meters and networks detailed in Sections 6.1 and 6.2 of Exhibit LEB-3. The Companies have not broken out the cost of backup power components from the total ongoing costs for meters and the network.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 49

Responding Witness: Eileen L. Saunders

Q-49. Accurate meter locations are fundamental to proper billing. Please describe the capabilities of the proposed asset inventory system for AMI with regards to geo-coding meter locations against a visible characteristic such as serial number or barcode number.

A-49. The asset inventory system will track meter locations while the meters are not in service; this includes the meter lifecycle of testing, cleaning, and storing while in inventory. The Companies capture GPS coordinates of their metering locations and store that information, along with characteristics like serial number, in several other systems like the Customer Information System, Geographic Information System, and others.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 50

Responding Witness: John K. Wolfe

Q-50. Exhibit JKW-2 alludes to potential overlap between information coming from AMI and existing SCADA systems. Does the utility anticipate the retirement of SCADA, or similar, legacy systems as part of AMI? If so, are these beneficial savings part of the analysis in Exhibit LEB-3?

A-50. No, AMI is not a replacement for SCADA or other distribution systems.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 51

Responding Witness: Eileen L. Saunders

Q-51. A number of the claimed benefits associated with AMI are improved communications and notifications. Wolfe testimony from EPRI Exhibit JKW-2 says there can be communications issues for customers with multiple accounts. LFUCG is a major customer with 380 accounts in the Residential, and General Service rates.

a. How will you address communications and notification issues for major customers to avoid confusion or to assist in identifying which account has the issue?

b. Also, the current MyMeter website utilizes a pull down menu if you have multiple accounts, as LFUCG does. What changes or improvements are proposed to assist major clients when accessing the MyMeter interface, i.e. finding one of 380 accounts in a pulldown?

A-51.

a. Communications will be linked to the meter on the account so that issues can be addressed specifically with the service associated with that meter and its account.

b. The Company's MyMeter interface now offers functionality that may help (e.g. providing the capability to "nickname" an account to make it easier to find within the pulldown list). Additionally, customers with multiple accounts that would like to view their accounts grouped together can create a "Meter Group" which then allows those customers to see more than one meter's data at a time. The Company welcomes other ideas LFUCG may have and an on-going dialog to help them through their Key Account representative.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 52

Responding Witness: Eileen L. Saunders

Q-52. How will information received from AMI meters be received, processed, and then made available via the MyMeter web portal?

a. Currently this process results in an approximate 24 hour delay. Will the expansion of AMI reduce this average time, or will the increased amount of data being processed increase this time?

b. Will there be differences noted for different customers, i.e. those in rural areas will take longer, currently opt-in accounts in more urban areas tend to update quicker?

A-52. Raw interval data from AMI meters is securely transferred to MyMeter web portal at least every 4 – 6 hours. Generally, the meter transfers data to a collector either directly or through another meter or router. The data is then transferred to a head-end system called Command Center. The meter data is currently transferred from Command Center to MyMeter. If the proposed AMI deployment is approved, a new step will transfer the validated interval data from the Meter Data Management System (MDMS) to MyMeter on a daily basis.

a. Currently the data in MyMeter web portal is updated every 4 - 6 hours for customers with mesh meters in the AMS Opt-In Program and every 24 hours for customers with cellular meters. It is expected that this time will not increase if the AMI expansion is approved.

b. The timeframe stated above is for all customers regardless of location. Communication or network problems can create a longer update period until the issue is resolved but this is the exception and not normal day-to-day experience.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 53

Responding Witness: Eileen L. Saunders

Q-53. Please refer to Exhibit JKW - 1 at page 35 of 44. Dominion energy utilized advanced analytics from their AMI data to identify individual electrical loads within the individual customer's homes to identify the individual heating system type. Refer to Exhibit ELS-2 KU-LGE Fact sheet sample "MYTH: Advance meters are an invasion of privacy. TRUTH: Advance meters measure how much energy you use, based on time of day, not how you use that energy. Unless you install a home energy management system, advance meters cannot tell whether the energy used is from your oven, air conditioner, or hair dryer." These two exhibits are contradictory, please provide explain the discrepancy.

a. Schneider Electrical, Sense, and several other manufactures currently have technology (hardware and software) that can and do utilize advanced analytics to identify specific electrical devices based on load characteristics, i.e. water heater, pump, dishwasher, etc. Thus, the technology exists and is currently in widespread commercial use. The Dominion case cited in Exhibit JKW indicates utilities will have the ability to do this level of analytics. Does the Company acknowledge that the AMI system proposed does not have the capability to measure or perform any advanced analytics?

b. Will the Company stipulate that should upgrades to the AMI equipment or software make it possible for advanced analytics in the future, the Company is committed to not utilizing this or any other technology to measure anything other than gross or net energy use over time as stated in this filing?

A-53. AMI meters measure interval energy consumption. When the interval consumption is married with time, then inferences can be made on the source of the consumption. For instance, a large increase in consumption every hour may indicate the energy consumed by an HVAC system above the home's baseline consumption. It is the combination of time with corresponding energy usage fed into an analytical system that is programmed to infer disaggregation of the energy consumption by device. Sometimes the addition of other data such as weather to time and energy consumption allows for better disaggregation. Thus, the two exhibits are not contradictory. The meter by itself does not identify individual devices in the home.

Energy use from the meter feed into an analytics system can infer end-use device consumption.

a. Confirmed. The AMI system proposed does not have systems or capabilities to perform advanced analytics.

b. No the Companies will not commit to only measuring energy. The Companies have policies to protect customer's privacy. The Companies previously committed to not sell customer energy usage information. Utilizing advanced analytics to understand how and when customers use the Companies' services is critical to planning for reliable and affordable service. Additionally, customers may want and expect the Companies to provide disaggregated usage so they can make informed decisions on energy efficiency investments they are planning. In addition, advanced analytics can assist in identifying system losses or theft. Consequently, the value of the interval data through advanced analytics is beneficial to both the customer and the Companies.

   The Companies will use the data and insights consistent with the privacy policies but will use the value of these analytics in the future to measure things other than gross or net energy over time.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 54

Responding Witness: Lonnie E. Bellar

Q-54. One principle factor the Company is promoting for the implementation of AMI is the ability for customers to utilize the information to perform energy management and cost reductions. What observations have KU or LG&E recorded regarding energy consumption changes in the Opt-in pilot group customers?

a. Provide all data from the Opt-in pilot group reporting average consumption reductions over time.

b. Was this data utilized to project system wide consumption reductions for AMI implementations?

c. How will these proposed reductions impact the Company's revenue and generation?

d. In Blake's testimony, under other drivers of requested revenue increase; KU is requesting an additional $15,000,000 due to reduction in load and net revenue. It appears based on this precedence that customers may be asked in the future to make up revenue shortfalls that are being shown as a driving factor to benefit the rate payers as a result of customer's energy management activities as a result of AMI implementation? Please explain how this request for additional revenue driven by load reductions, partially due to the widespread adoption of LED lighting, i.e. rate payer energy management activities will not result in future requests for additional revenue?

A-54. The Companies disagree with the assertion that energy management is a principal factor for AMI implementation, as the project is primarily justified on operational savings. The Companies' observations are a result of Tetra Tech's analysis, summarized in Appendix E of Exhibit LEB-3.

a. See Exhibit LEB-3, Appendix E.

b. Yes. See page A-19 of Appendix A in Exhibit LEB-3.

c. The proposed reductions will reduce generation and associated fuel expense as evaluated in Exhibit LEB-3. See page A-19 of Appendix A in Exhibit LEB-3. The AMI analysis was focused on these impacts, the Companies have not evaluated the impact on total revenue. Broadly, Company net revenue will also be impacted in any case where consumption is reduced and fixed costs are being recovered in a variable rate, a general concept related to rate design not unique to AMI as noted.

d. See the response to part c. Additionally, the evaluation in Exhibit LEB-3 shows from a PV perspective revenue requirements overall will be lower should an AMI deployment be undertaken as proposed. Thus, on balance revenue requests from customers (considering all rate mechanisms) will be lower than the Status Quo.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 55

Responding Witness: Eileen L. Saunders

Q-55. Refer to Blake testimony Page 18, Line 15 regarding "development of a complete RF mesh network across the Companies' service territories" and Wolfe Testimony, page 28, line 7, regarding "Using the existing, Company-owned, radio frequency mesh network could provide cost savings not possible without that network"

a. Is the RF network referred to by Mr. Blake, the same one referred to by Mr. Wolfe?

i. If not, what "development" is needed to meet the needs of the proposed AMI meters

ii. If so, why does a new RF mesh network need to be developed?

b. Please describe in detail the network needs to meet the AMI proposal that do not currently exist.

A-55.

a. Yes.

i. N/A

ii. The RF mesh network needs to be further developed to communicate with the meters and transfer data/information to and from the meters. The existing RF mesh network, predominately in Jefferson and Fayette Counties, will continue to be utilized in those areas. Operating the metering function to bill customers is the primary purpose of the network. However, the network can be utilized for additional services and information important to Electric Distribution where they do not have communications networks, such as capacitor banks. The RF mesh network can provide communications to those devices that is faster than rolling a truck to the device but is not at the same speed required for a critical infrastructure system such as SCADA.

b. The Companies do not have a network that spans to every meter served. The networks the Companies operate cover major and critical equipment necessary for the safe and reliable provision of electric and gas service. The RF mesh network will expand to cover every meter and thus provide information from these meters for analysis and operational purposes, which does not exist today

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 56

Responding Witness: Eileen L. Saunders

Q-56. Please refer to Blake's Testimony at A-15, at which Blake indicates that the proposed use of remote connect/disconnects will be a source of cost savings. It is unlikely that all future connects/disconnects will be done remotely.

a. What percent of each have you used for cost savings projections? What support do you have for these assumptions?

b. If these assumptions prove wrong, or there are unforeseen issues that may arise with remote connects/disconnects causing them to be discontinued. Quantify the fiscal impact on future projected savings, if remote connect/disconnect does not meet assumptions.

A-56. The Companies note that the referenced testimony appears to be from Exhibit LEB-3 at A-15.

a. The Companies estimated cost savings by analyzing Field Services' traditional workload relative to activities that would be impacted by AMI, along with the historical percentage of disconnects/reconnects that have occurred on accounts that would be expected to have the remote capability with AMI. In 2019, over 97% of disconnections/reconnections related to credit involved a meter that would be expected to be capable of remote connection once AMI is installed.

To be conservative, the Companies assumed that some amount of new activities will result from AMI and retained Field Services staff to perform these activities and manage exceptions to remote disconnections/reconnections. The Companies leveraged internal subject matter experts to then review staffing such that the Companies maintain appropriate geographic coverage to respond to customer needs.

b. It is reasonable to assume that the vast majority of service disconnections/reconnections will be completed remotely, and that retained Field Services staff will be able to manage exceptions to this process. The

Companies have not performed any analysis that assumes a higher level of Field Services labor.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 57

Responding Witness: Eileen L. Saunders

Q-57. Referring to communications with the proposed AMI meters,

a. Why is communication with the proposed AMI meters using RF and not fiber or other wireless communication options?

b. Will the proposed AMI meters be compatible with fiber communications?

c. Will the proposed AMI meters be compatible with other wireless communications options?

d. Would there need to be any additional costs to use fiber communications?

e. Would there need to be any additional costs to use other wireless communications options?

f. Does current wireless technology in Fayette County meet requirements of full use of the proposed AMI technology?
   i. If the answer to f is "no", what level of wireless technology will be needed?

A-57. a. See the response to AG-KIUC 1-200.

b. No

c. No.

d. Yes, fiber doesn't exist to every meter. The Companies are using fiber to facilitate backhaul from collectors when possible but not every planned collector location has fiber available.

e. Yes.

f. The Companies are not aware of the capabilities of Fayette County wireless technology. Should wireless technology refer to publicly available cellular networks, those can be used to support AMI technology but the associated risk of premature obsolescence makes it imprudent for meter level communications at scale. See AG-KIUC 1-200. The Companies plan to use public cellular to aid data backhaul from collectors.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 58

Responding Witness: Eileen L. Saunders

Q-58. Please Refer to Application Exhibit #4. The Landis and Gyr AMI equipment indicates is it "Zigbee" enabled for home network.

a. Will the Company allow homeowners the option of connecting to this "Zigbee" connection?

b. Will this allow customers to monitor their energy consumption in "Real time" via the "Zigbee" connection?

c. Does the Company anticipate charging a fee for customers to utilize the "Zigbee" connection?

d. If the Company will not allow customers to utilize this feature contained within the proposed equipment, what is the reason and justification for not permitting customers to monitor via the meter's local "Zigbee" connection?

A-58. See the Companies response to AG-KIUC 1-214.

a. Yes.

b. Yes, it could with a "bridge" or other device connected via Zigbee.

c. No, not to use the connection.

d. Not applicable.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 59

Responding Witness: Kent W. Blake / Eileen L. Saunders

Q-59. Refer to Thompson testimony page 5, line 18, "The Companies have devoted significant resources to assessing potential cybersecurity vulnerabilities with their operational technology infrastructure and are developing a plan for mitigating those vulnerabilities" and various other statements.

a. Explain in detail the resources allotted to potential cybersecurity vulnerabilities.

b. What is the default behavior of the proposed AMI meters when experiencing a service interruption?

c. What is the default behavior of the proposed AMI meters when experiencing a cybersecurity attack?

d. Do the proposed AMI meters have a physical, mechanical override function?

e. How will company inform specific customers of cybersecurity breaches?

f. How will company inform the public of cybersecurity breaches?

g. Will the company agree to communicate cybersecurity breaches with LFUCG?

A-59.

a. The Companies have 24 employees dedicated to cybersecurity. Additionally the Company uses the following organizations and partnerships for threat monitoring and detection: Edison Electric Institute (EEI), including the Cyber Mutual Assistance (CMA) program; Electric Power Research Institute (EPRI); Electricity Information Sharing and Analysis Center (E-ISAC); Cybersecurity Risk Information Sharing Program (CRISP); FBI Infragard Partnership Program; FBI Domestic Security Alliance Council (DSAC); Department of Homeland Security (DHS) – Protective Security Advisors; Fusion Centers in all service areas.

b. The meter maintains its current status upon a service interruption.

c. The meter does not have a capability of determining a cybersecurity attack. The meter reports events such as disconnect, reconnection, tilt, reverse flow which can be used to determine tampering. All AMI meters have advanced security communications which means that every meter has its own individual encryption certificate to communicate with the head-end system.

d. AMI meters have the capability to be closed by an authorized company representative at the meter should the communications fail.

e. Not all cybersecurity breaches result in customer data being compromised. The specifics of a cybersecurity breach determine how the Companies communicate with customers. In the event the Companies determine customer communications are appropriate they will use standard customer communication options (e.g. postal mail, phone calls, etc.) to ensure customers are informed so they can take appropriate individual actions.

f. Not all cybersecurity breaches result in customer data being compromised. The specifics of a cybersecurity breach determine how the Companies communicate to the public. In the event the Companies determine customer communications are appropriate they will use standard public communication options.

g. Communication of a cybersecurity breach to LFUCG will be determined based upon the specifics of any breach.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 60

Responding Witness: Robert M. Conroy

Q-60. The Company has described AMI System as a series of systems integrated to provide many benefits, application exhibit 3. As such, when the project is complete and cost recovery is sought, estimated to be in 5 years,

a. Will The Company seek cost recovery across all rate payers, as this system benefits the entire distribution system?

b. Will advanced meters become available for Power Service customers, if so when, if not why?

c. Currently, the Company's Power Service meters bill in 15 minute intervals, but do not record any data, thus there is no time stamp available when meter/billing issues arise. Are there any plans to address this issue?

A-60.

a. Cost recovery will follow cost of service principles and will be addressed in the next base rate proceeding. Mr. Bellar states in his direct testimony, page 54 lines 1-3, "Under the ratemaking proposal Mr. Blake presents, there will be no rate impact to customers as a result of these rate cases and customers will ultimately receive the cost savings AMI will provide."

b. Some Power Service meters will receive advanced meters. Those that are currently processed and billed by the Company's Itron MV-90 system are not in scope for the proposed AMI deployment due to the complexity of billing rate determinants and calculation validations. The advanced meter deployment schedule has meters installed from late 2022 – 2026.

c. Yes. AMI meters will have 15 minute consumption data available that is date and time stamped.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 61

Responding Witness: Robert M. Conroy / Eileen L. Saunders

Q-61. Will AMI extend to Time of Day (TOD) Primary and Secondary and Power Service (PS) Primary and Secondary meters/rates?

a. If PS and TOD meters are not impacted by AMI, will these still be read in person monthly?

b. Will all currently required meter inspections and testing that are requested to be waived, modified, or eliminated in this rate case continue or will these be modified even though AMI meters will not be installed on these accounts?

A-61. Time of Day (TOD) Primary and Secondary meters, and Power Service (PS) Primary and Secondary meters which are currently processed and billed by the Company's Itron MV-90 system are not in scope for the proposed AMI deployment due to complexity of billing rate determinants and calculation validations.

a. The above-mentioned meters will continue to be read monthly through the Company's existing meter reading process.

b. All currently required meter inspections and testing will continue unchanged for the above-mentioned meters.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 62

Responding Witness: Eileen L. Saunders

Q-62. Collective billing can results in delays up to 59 days from the meter read date to bill issuance, and/or the availability of detailed use and billing data on the customer web portal. Please elaborate on any changes to collective billing that are proposed or may result from AMI implementation.

a. Would the proposed AMI system decrease the time from meter reading to bill issuance for collective billing customers?

b. Would the decrease apply to all rate codes using collective billing? If not, please identify which rate codes would not benefit.

A-62. The proposed AMI implementation is not expected to change collective billing processes in that a collective bill cannot issue until reads from all meters under the collective bill have been received.

a. The proposed AMI system will enable the Companies to explore ways to bring the meter reading timeframes closer together for meters under a collective bill, thus potentially shortening the time it takes to issue a collective bill.

b. Any potential decreased time between meter reading to bill issuance would be the result of meters under the collective bill moving to AMI, as such, the decrease will not apply to all rate codes and would also be impacted by any AMI opt out under the collective bill. Setting opt out aside, collective billing that includes Time of Day (TOD) Primary and Secondary meters, and some Power Service (PS) Primary and Secondary meters which are currently processed and billed by the Company's Itron MV-90 system would not be expected to benefit from decreased time from meter reading to bill issuance.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 63

Responding Witness: Eileen L. Saunders

Q-63. Will deployment of the AMI system result in any changes to customers that currently receive utility billing information via "Flat File"? If yes, please explain what changes are anticipated.

A-63. Yes. Customers will still be able to receive their "Flat File." However, AMI offers enhanced capabilities and customers may find they no longer have a need for a "Flat File." For example, customers can download their data from the MyMeter web Portal on demand. Customers can set usage alerts and see the data graphically.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 64

Responding Witness: William Steven Seelye

Q-64. Regarding Schedule M-1.3, please affirm or clarify whether the lines for "Solar Energy Credit" represent energy exported to the utility grid from privately owned distributed generation systems, and that the total generation received in the base year was 498,348 kWh.

A-64. No. In Schedule M-1.3, "Solar Energy Credit" refers to energy credits provided to customers served under LG&E's Solar Share or Business Share Programs. These credits do not represent energy exported to the utility grid from privately owned distributed generation systems.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 65

Responding Witness: Robert M. Conroy

Q-65. Please refer to Seeley testimony at 43 that refers to the Rider SQF that was implemented to comply with Sections 201 and 210 of the Public Utility Regulatory Policies Act of 1978. What is the capacity limit for qualifying facilities under PURPA?

A-65. The capacity limit for a qualifying facility under PURPA is 80 MW; however, Rider SQF is limited to 100 kW.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 66

Responding Witness: Robert M. Conroy

Q-66. Is SQF tariff value equal to the avoided cost to the Companies of providing unneeded energy to the qualifying cogeneration or small power production facilities while these facilities are generating and providing power to the companies' system?

a. Please provide the calculations the Company used to compute the existing Standard Rate Rider SQF.

b. Do Sections 201 and 210 of the Public Utility Regulatory Policies Act of 1978 require that the SQF tariff be equal to avoided cost? Please provide the reason for your answer.

A-66. Yes.

a. See the response to AG-KIUC 1-172.

b. The legal authority under for the Companies' Standard Rate Rider SQF is 807 KAR 5:054, which the Commission promulgated in accordance with the Public Utility Regulatory Policies Act of 1978. The Commission's regulation states at Section 7(2) regarding utility purchases from qualifying facilities with design capacity of 100 kilowatts or less, "These rates shall be based on avoided costs after consideration of the factors listed in subsection (5)(a) of this section …." The factors to which the quoted regulation refers are:

> Availability of capacity or energy from a qualifying facility during the system daily and seasonal peak. The utility should consider for each qualifying facility the ability to dispatch, reliability, terms of contract, duration of obligation, termination requirements, ability to coordinate scheduled outages, usefulness of energy and capacity during system emergencies, individual and aggregate value of energy and capacity, and shorter construction lead times associated with cogeneration and small power production.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 67

Responding Witness: William Steven Seelye

Q-67. Please refer to Seeley testimony at 54. The DG customer load profile shown in Graph 3 would be impacted by the azimuth of the systems and the relative size of each system.

a. Please provide the capacity and azimuth of the systems used to derive the DG profile.

b. In the absence of such data, is it reasonable to assume that the systems would favor a due-south azimuth?

c. Please clarify the Y-axis scaling. Is "Net Metering Load" and average or weighted value whereas "Total Residential Load" is cumulative?

A-67.

a. The data used to derive Graph 3 was developed from actual hourly metering data for a small sample of distributed generation customers. The Companies do not have the capacity and azimuth of the systems.

b. The Companies have no knowledge of whether the customer's solar panels favor a due-south azimuth.

c. The Y-axis for "Total Residential Load" is the total hourly load for all residential customers. The Y-axis for "Net Metering Load" is the sum of all kWh per hour for a group of residential distributed generation customers for which the Companies have recorded 15-minute demand intervals. The purpose of the graphs is to illustrate the difference in load shapes for the residential rate class as a whole and for a sample of distributed generation customers. (The load data used to develop these load shapes are not based on a statistically valid sample, particularly considering the large variance in the usage patterns for net metering customers.)

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 68

Responding Witness: Robert M. Conroy / William Steven Seelye

Q-68. The recently amended net metering statute, KRS 278.466, states, in part: "Using the ratemaking process provided by this chapter, each retail electric supplier shall be entitled to implement rates to recover from its eligible customer-generators all costs necessary to serve its eligible customer-generators, including but not limited to fixed and demand-based costs, without regard for the rate structure for customers who are not eligible customer-generators." Please describe in detail how the tariff rate in NMS-2 recovers these "costs"? Does the rate proposed in NMS-2 collect more than these "costs" from the eligible customer-generator?

A-68. See the testimony of Mr. Seelye beginning at page 46. The proposed Rider NMS-2 addresses the compensation for energy supplied to the grid; it does not address cost recovery from Rider NMS-2 participants.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 69

Responding Witness: Robert M. Conroy

Q-69. How many total customers of the Company currently take service under NMS?

A-69. See the response to Sierra Club 1-2(a).

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 70

Responding Witness: Robert M. Conroy

Q-70. How many customers began taking service under NMS for the first time in each year from 2010 to 2020?

A-70.

Year of Original Installation	KU
2010	9
2011	11
2012	10
2013	12
2014	19
2015	40
2016	26
2017	43
2018	56
2019	131
2020	142
	499

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 71

Responding Witness: Christopher M. Garrett

Q-71. Please provide a listing of all revenue LG&E/KU received from PJM and MISO (provided separately) by year for the years 2017-2020 by category including but not limited to transmission, energy sales and capacity sales.

A-71. See attached.

Kentucky Utilities Company
Case No. 2020-00349

MISO and PJM revenues
For the Calendar Years 2017 through 2020

Line No.	Item	Years ended 2017	2018	2019	2020
1.	MISO revenues				
2.	Energy	$ 1,089,894	$ 2,638,386	$ 1,397,966	$ 853,959
3.	Transmission	$ -	$ -	$ -	$ -
4.	Capacity	$ -	$ -	$ -	$ -
5.	Total MISO revenues	$ 1,089,894	$ 2,638,386	$ 1,397,966	$ 853,959
6.	PJM revenues				
7.	Energy	$ 1,625,476	$ 5,287,740	$ 1,280,483	$ 415,851
8.	Transmission	$ -	$ -	$ -	$ -
9.	Capacity	$ -	$ -	$ -	$ -
10.	Total PJM revenues	$ 1,625,476	$ 5,287,740	$ 1,280,483	$ 415,851

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 72

Responding Witness: Lonnie E. Bellar

Q-72. Please explain why and how energy and capacity payments would increase by being a member of PJM/MISO from the status quo.

A-72. The Companies' RTO membership analyses have shown potential benefits and costs from participating in the RTOs' energy and capacity markets. There are potential net positive trade benefits from participating in the energy markets, which would occur by receiving market energy sales margins that are higher than the market energy purchase costs for retail and wholesale requirements customers. There are potential net positive capacity auction benefits, which would occur if the market value of the Companies' generating capacity that clears the RTO capacity auction is positive when netted against the cost to purchase enough capacity to cover the Companies' capacity need as defined by the RTO. The potential also exists for net costs to be higher than the status quo.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 73

Responding Witness: Lonnie E. Bellar

Q-73. Did the 2018 RTO Membership Analysis include both FRR and RPM for PJM? If yes, please provide the results. If not, why not?

A-73. No, the 2018 RTO Membership Analysis only included RPM for PJM. The Companies focused on RPM to allow for the potential revenues from the capacity market to result in the most cost-effective scenario for their customers. Because FRR is an alternative to RPM for an entity to satisfy its capacity obligations in PJM, it would not have been practical to also include FRR in the analysis.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 74

Responding Witness: Lonnie E. Bellar

Q-74. Are there quantifiable cybersecurity and reliability benefits that LG&E/KU would receive for belonging to PJM or MISO? If so, please state what they are and if not, please state why not.

A-74. The Companies have not quantified such potential benefits. The potential cybersecurity benefits or costs that might result from the tradeoffs of switching to new software platforms required to participate in the RTOs are unknown. Because the RTOs and the Companies plan reliability using similar targets, the differences in reliability may be minimal. However, ceding control of the Companies' generation and transmission systems to the RTOs from the Companies, their stakeholders, and regulators would put the reliability interests of the Companies' customers into a broader pool of various entities across multiple states and would be costly to reverse. MISO, in particular, is facing projected reserve margin deficiencies and resource inadequacy, as reported by the North American Electric Reliability Corporation ("NERC").[6] PJM is in a more favorable capacity position, but is planning its next capacity auction for May 2021, which will be its first auction since 2018 as it has struggled to implement market design and rules changes.

[6] See NERC's "2020 Long-Term Reliability Assessment," December 2020 at https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2020.pdf.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 75

Responding Witness: Lonnie E. Bellar

Q-75. Please provide a current update on the status of SEEM which was described in Mr. Bellar's testimony.

a. Are there any reliability benefits from being a member of SEEM? If yes, please state why and if not, please state why not.

b. Has a financial analysis been provided analyzing the financial advantages and disadvantages of membership? If so, please attach a copy of such study.

A-75. See the response to PSC 2-30.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 76

Responding Witness: Lonnie E. Bellar

Q-76. Is there any cost associated with the SEEM proposal in the current rate case? If yes, identify the amount.

A-76. See the response to PSC 2-30.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 77

Responding Witness: Robert M. Conroy

Q-77. How do the Companies plan to get approval from the PSC for SEEM if they choose to participate?

A-77. See the response to AG-KIUC 1-243.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 78

Responding Witness: Lonnie E. Bellar

Q-78. Are LGE/KU still members of SERTP?

a. Does SERTP remove the necessity of LGE/KU belonging to an RTO?

b. Did the RTO analysis filed in the 2018 rate case and updated in March 2020 assume that LGE/KU continues to belong to SERTP?

A-78. Yes

a. There is no requirement for LGE/KU to be in an RTO; therefore, SERTP does not remove the necessity of LGE/KU belonging to an RTO. LGE/KU belong to SERTP in compliance with FERC Order 1000. Compliance with Order 1000 could be met with membership in another region that is not necessarily an RTO.

b. Yes

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 79

Responding Witness: William Steven Seelye

Q-79. Did the cost of service study prepared by William Steven Seelye for this case include any categories of costs used to determine customer charge which were not included in his 2018 cost-of-service study for the Company? If the answer is yes, please list the nature of the costs and the amount.

A-79. There are not any categories of costs used to determine the customer charge in this case that were not included in the Company's last rate case.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 80

Responding Witness: William Steven Seelye

Q-80. Were there any changes in the methodology in the 2020 cost of service study from his 2018 cost of service study? If the answer is yes, please describe the changes.

A-80. There are no changes in the methodologies that were used to prepare the cost of service study in this case and those used in the 2018 Rate Case.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 81

Responding Witness: William Steven Seelye

Q-81. Why did the customer service charge costs (as reflected in the cost of service study) increase from approximately $.67 in conjunction with the 2018 rate case to approximately $0.69 per day in 2020? If the increase is cost is approximately 3% why is the increase sought 15.6%.

A-81. The increase in the customer costs is due to general increases in rate base, O&M expenses, A&G expenses, taxes, and other costs.

While the customer-related costs for RS have increased only 3% since the Company's last rate case, the approved customer charge in the 2018 rate case was only $0.53 per customer per day. To better align rates with cost causation, the Company is proposing to move the daily customer charge to $0.61 per day which is closer to actual cost of $0.69 per day.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 82

Responding Witness: William Steven Seelye

Q-82. Are all fixed and demand-based costs necessary to serve residential customers recovered through the Basic Service Charge and the Infrastructure portion of the Energy Charge? If not, where else are they? Why?

A-82. Yes, all fixed and demand-based costs necessary to serve residential customers are recovered through the Basic Service Charge and the Infrastructure portion of the Energy Charge.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 83

Responding Witness: Lonnie E. Bellar / John K. Wolfe

Q-83. Please provide a copy of every vegetation management plan employed by LGE/KU during the last 20 years for:

a. distribution lines; and

b. transmission lines.

A-83.

a. See attached for the 2007 Distribution Vegetation Management Plan filed with the KPSC.

b. See attached.

Mr. Jim Welch
Director of Engineering
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602-0615

E.ON U.S. LLC
State Regulation and Rates
220 West Main Street
PO Box 32010
Louisville, Kentucky 40232
www.eon-us.com

Rick E. Lovekamp
Manager - Regulatory Affairs
T 502-627-3780
F 502-627-3213
rick.lovekamp@eon-us.com

December 19, 2007

RE: *An Investigation of the Reliability Measures of Kentucky's Jurisdictional Electric Distribution Utilities* ***and Certain Reliability Maintenance Practices*** **- Administrative Case 2006-00494**

Dear Mr. Welch:

Enclosed please find Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company's ("KU") Vegetation Management Plan pursuant to the Commission's Order dated October 26, 2007 in the above mentioned matter.

Should you have any questions concerning the enclosed, please do not hesitate to contact me.

Sincerely,

Rick E. Lovekamp

Louisville Gas and Electric Company
and
Kentucky Utilities Company

Distribution Vegetation Management Plan

Table of Contents

Introduction

The Distribution Vegetation Management Program encompasses right of way maintenance for Louisville Gas and Electric Company and Kentucky Utilities Company (referred to as the "Companies"). The program is centralized and managed by a Forestry Manager and nine company Utility Arborists. All are certified arborists by the International Society of Arboriculture. The Companies employ five professional tree contractor companies (Asplundh, Nelson, Phillips, Townsend and Wright). Utility line clearing is undertaken to maintain safety, reliability of service, and access to the utility's facilities for maintenance and repair.

Safety

The Companies primary focus and core value is to ensure the health and safety of our employees, business partners, and the public. The policies, procedures, and goals contained in the Companies' *No Compromise Plan* support our current operating and safety commitments. Contractors shall regard safety as their first priority. Contractors and their employees will recognize and follow all laws, rules and regulations regarding public and worker safety. Any incident must be reported to the appropriate safety consultant immediately. Tree Trimming Contractors are held accountable for safety per OSHA and Company standards. Every new contract employee must complete a safety training program in the first 30 days. Safety performance is also included in the contractor evaluation.

Right of Way Maintenance Strategy

The Companies employ an Integrated Vegetation Management Program (IVM) that is the process of using chemical, manual, or mechanical techniques to control undesirable vegetation and includes natural or directional pruning, environmentally safe herbicides, and tree removals. The program includes flexibility to operate and maintain variable easement widths, differences between rural and urban service areas, applicable codes or ordinances, and the need to maintain some level of flexibility in addressing landowner requests or concerns. Schedules and priorities for tree trimming are based on vegetation growth, cycle-last trim date, reliability data, and visual inspections. Reliability centered maintenance concepts are also employed in establishing tree trimming priorities.

The plan includes the application of a flexible multi-cycle strategy to address growth and tree density which will vary across the service area. The Companies' plan is to maintain a proactive trim cycle while balancing the reactive needs of worst performing circuits. The Companies' goal is to maintain an average trim cycle of five years or less.

All tree trimming shall be governed by approved principles of modern arboriculture and shall adhere to International Society of Arboriculture (ISA) standards. Other standards utilized in the program include ANSI A300, NESC, and OSHA 1910.269 as well as compliance with tree ordinances and local codes.

Reliability Criteria and Reports

The reliability criteria used to develop the vegetation management plan are system SAIDI, SAIFI, and CAIDI. System performance targets are established annually. Reports used to develop the plan include the Worst Performing Circuit Report and Circuit SAIDI, SAIFI, and CAIDI Reports.

The Annual Reliability Report will include the Worst Performing Circuits and how well the Companies implemented its vegetation plan as well as changes to the plan in the coming year.

Work Plan

Work plans are prepared annually by circuit based on vegetation growth, cycle-last trim date, reliability data, and visual inspections by arborists who develop work plans to target trees that need to be trimmed or removed as well as the flexibility to prescribe a different trim cycle by circuit that addresses growth and tree density for that circuit. A mid-cycle "touch up" is used as needed based on field inspections for multi-phase lines. The vegetation plan strategy will balance the routine trimming plan to maintain an average trim cycle with the reliability centered maintenance plan to address the worst performing circuits. The top 10 worst performing circuits are identified by each reliability index. These circuits are evaluated to determine root cause of the outages. If the root cause is tree related, the arborist will visually inspect the circuit to determine the appropriate plan of action.

The Work Plan includes the following sections:

Routine Trimming Cycle Plan
The routine trimming cycle plan is a proactive plan to trim circuits based on the date last trimmed.

Mid-Cycle Touch Up Plan
The mid-cycle touch up plan focuses on specific fast growing and hazard trees on multi-phase lines.

Herbicide Treatment Plan
The herbicide plan is a proactive plan to control brush and immature trees.

Worst Performing Circuits Plan
The worst performing circuit plan is a reactive plan that has identified trees as the root cause of poor performance and is recommended by the arborist after inspection to be included in the tree work plan.

Evaluation of Plan Effectiveness

The effectiveness of the plan is evaluated by the cycle, system performance as measured by system SAIDI, SAIFI and CAIDI, and customer feedback as measured by satisfaction surveys. Reports used to monitor the plan effectiveness include the Circuit Reliability Report, System SAIDI, SAIFI, and CAIDI Reports, and Customer Satisfaction Surveys.

Customer Communication

Each customer on the circuit receives a mailing notification letter, one to two weeks prior to beginning the circuit work. The crew "knocks on the door" before the work begins. Customer complaints are investigated. Customer satisfaction is included in the contractor evaluation. Customer education about tree trimming and planting trees is provided in consumer mail inserts, participation in community events, and media announcements.

Contractor Performance Management

The vegetation management strategy includes target pricing and firm bid work. Target pricing promotes efficiency in contractor resource management. The target price strategy deploys prescriptive tree management techniques. All trees and brush are planned, counted, and marked on a circuit map, span by span. Contractor work is prescribed and a target price is established for the work. Every circuit is inspected after the tree work is complete. Approximately 8 to 10 percent of the tree work is bid on a firm basis to validate target pricing and encourage contractor competition.

Contractor's performance is evaluated based on safety, productivity, quality, and customer satisfaction on a quarterly and annual basis. Contractors are held accountable for safety per OSHA and Company standards.

PPL companies

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

02/01/2011
Revised 02/19/2014
Revised 03/22/2016
Revised 8/8/2018

Submitted by Ted Clawson, Kevin Montgomery

PPL companies

Transmission

Table of Contents

PPL companies

Transmission

PPL companies

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

1. Introduction

These Vegetation Practices, Approved Procedures and Specifications are preferred methods for performing vegetation work on the LGE-KU transmission system.

2. Aerial Spraying

Aerial herbicide treatment of transmission rights-of-way is the preferred method of maintenance. It is a highly technical and specialized technique and shall be performed by properly licensed applicators.

2.1. Liquid

Liquid applications shall be made only between the time of full leaf development and the first of September. Granular applications shall be made only after total leaf drop and prior to any leaf development.

2.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

2.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated. Spraying shall not be done when wind exceeds 5 miles per hour.

2.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

2.5. Brush and Tree Heights

Brush and trees should be a minimum of 5 feet high for best results in order to absorb a lethal quantity of herbicides.

PPL companies
Transmission

2.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

2.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

2.8. Spray Boom

The spray boom and mounting arrangement shall meet all application requirements and the spray boom, similar to the micro-foil, with 0.060 nozzles, shall maintain proper pressure for spray solution during complete applications.

2.9. Moisture Restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3. High Volume Foliar Application

HVF is best suited in areas of medium to heavy brush and tree density, particularly where aerial applications cannot be performed.

3.1. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

PPL companies
Transmission

3.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

3.5. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

3.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

3.8. Low Volume Foliar Application

LVF is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and cleanup of resistant plants on r/w or where aerial application or high volume foliar application cannot be performed.

3.9. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.10. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.11. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

3.12. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most garden

Transmission

3.13. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.14. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

Spray solution shall be applied first at top of foliage working downward, wetting leaves.

Spray nozzle setting shall be varied by operator, from a Flat Fan Tip for brush less than 6 feet tall to an Adjustable Cone Tip adjusted to a straight stream for lacing on brush greater than 6 feet tall, to obtain sufficient wetting of each plant.

Brush and trees shall not be sprayed at a distance greater than 15 feet from the spray nozzle.

3.15. Moisture restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3.16. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

4. Low Volume Basal Application

LVB is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and cleanup of resistant plants on r/w or where aerial application or high volume and low volume foliar applications cannot be performed.

4.1. Application

Applications may be made in all seasons of the year when authorized and weather permitting, but is best suited for dormant season application. LVB is to be applied using backpack equipment.

PPL companies
Transmission

4.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

4.3. Spray Pattern

Spray nozzle shall be directed at base of plant and moved upward in a slow steady motion.

Spray solution shall be applied evenly to the point of run-off over the lower 18”-24” of stem, root collar and exposed roots.

Nozzle pressure shall be adequate for efficient distribution of solution without waste.

4.4. Brush and Tree Heights

Normally 5’-10’ on private rights-of-way and heights up to 15’-20’ where authorized.

Normally 4’-6’ along public roadsides.

Low growing herbaceous (ground cover) plants shall not be treated.

4.5. Weather Restrictions

Solution shall not be applied when brush or tree stem is wet from dew, fog, rain, or covered with ice or snow. Do not apply LVB when temperature is below freezing.

Solution shall not be applied when wind interferes with proper spray pattern.

5. Cut Stubble Application

A soil active product best suited following mowing of R/W and prior to vigorous re-growth.

5.1. Application

Application shall be only when the temperature is above freezing. However, do not apply when the ground is frozen, or heavily saturated after rainfall.

5.2. Formulation

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

5.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

5.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

5.5. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

6. Stump Treatment

To be applied to the cut surface area following hand cutting.

6.1. Application

Application can be made in all seasons of the year, except during sap flow, to deciduous species when weather permits.

6.2. Formulation

Same as basal spraying.

6.3. Timing and Spray Solution

Shall be applied when clearing has occurred along transmission R/W. Water based mix must be applied within one hour following cutting, and oil based mixture should be applied as soon as possible following cutting, but no longer than 4 hours. The cambium layer will be treated completely around the circumference of the stump.

6.4. Spray Equipment

May be applied with backpack sprayer, or even hand type sprayers.

7. Brush and Tree Control Notification and Agreement

Before manual, mechanical, or herbicide brush work is begun, agreed to work shall be clearly communicated by Company representative to Contractor's representative. Nearby property owners may need to be notified of work plan and schedule.

When necessary to do so, a qualified representative of the Contractor shall procure rights for work on private property, Federal, State, and County road rights-of-way. If required in special cases, a Company representative may assist.

PPL companies
Transmission

Contractor crew foreman shall notify and secure agreement from adjacent property owners for scheduled brush and tree work on and along public roads.

During the performance of applying herbicides, special care shall be exercised to assure that no damage will occur to livestock and crops, and insure that no herbicide is misapplied nor left un-attended.

8. Mowing, Shredding, and Side Trimming

Mowing and tree shredding is used to clear easements and reclaim the edges of the rights-of-way. Side trimming is used to clear limbs growing toward and over the lines.

8.1 Equipment

Specific equipment to be used on the right-of-way to mow, mulch or side trim the edges shall be determined by the size and type of vegetation and the terrain to be mowed.

8.2 Types of Equipment

- Kershaw, Hydro-Ax, Barko or equivalent with Fecon rotary mower
- 4X4 Heavy Duty Tractor with Bush Hog
- Excavator with Tree Shredder attachment
- Excavator with Fecon Rotary attachment
- Skytrim or Jarraffe type, (75’ boom with 24” saw attachment)
- Aerial Saw for side trimming (attached to helicopter)

9. Resistant Species

Due to basic plant characteristics and probability rate of plant food assimilation, certain brush and tree species may not react quickly to foliage treatment. Alternative methods may be recommended by Company.

9.1. Coniferous Species

Where coniferous (retain live needles or leaves year round) plants are a brush or tree control problem, Company shall provide approval of methods for treating these species.

PPL companies
Transmission

9.2. Caution

To obtain maximum effect from herbicides, foliage and basal spray treated brush and trees shall not be cut or otherwise disturbed for a minimum period of one year.

10. Brush and Tree Disposal and Site Clean Up

This section deals with the time consuming and often difficult problem of brush and tree disposal from work performed on public and private property. The average property owner expects a site left in as orderly a condition as when work began. Public agencies will not permit littering of public places.

10.1. Tree Work Clean Up

In the interest of sanitation, safety and orderliness, most local, county, and state governments have regulations against the abandonment or dumping of any foreign materials in public places. Many municipalities provide landfills and regulate their use. Such facilities should be used when conveniently close to tree work operations. Regardless of methods employed to meet local circumstances, Contract supervisors shall not risk any Company or personal liability in brush and tree disposal.

- All severed limbs and branches shall be removed from trimmed trees.
- Tools and ropes shall be removed from trees and ladders placed aside.
- Brush Handling
- Brush and wood should be moved off travel ways and sidewalks as same reaches the ground and in a manner not to unnecessarily inconvenience the traveling public.
- When a tree is completed, brush should be promptly loaded on the truck or fed into a power chipper.

10.2. General

- Wood and brush shall not be stored in public places over night without permission.
- In rural areas, brush and wood may be disposed of in accordance with property owners wishes except same must not be left on road rights-of-way.
- All urban and suburban sites shall be thoroughly cleaned.
- Lawns, parkways, and sidewalks shall be cleaned of leaves, twigs, and litter.
- Care shall be taken not to damage any of the property owner’s facilities.
- Where wood and brush is discarded at landfills, all regulations shall be complied with.
- Loaded brush shall not extend beyond truck bed sides and if more than 4’ over rear end, same shall carry a red flag.
- Where permissible by rural property owners and public highway regulations, debris from power chippers may be blown on the rights-of-way or into the woods.
- Chips left at the site shall be thinly scattered to leave no objectionable bulk or may be stacked or bagged as agreed to by the property owner.

- Brush and tree wood should be disposed of in the most economical manner in accordance with all regulations and laws.
- Avoid unnecessary handling and hauling. Burning of brush and trees is generally not allowed.

10.3. Poisonous Plants

Tree workers should be able to readily identify poisonous plants, such as poison ivy, poison oak, and poison sumac, since contact with this plant can cause skin rash and extreme swelling. Workers should also be able to identify wild cherry and buckeye and take necessary precautions to insure that livestock will not have the opportunity to eat the leaves of these trees following cutting or herbicide treatment.

11. Tools and Equipment

This section deals with Contractor's selection, use and care of tools and equipment for line clearing operations. Suitable Contractor equipment, maintained in good working condition, makes tree work easier for workers and yields best results.

11.1. Clearing, Removal, Trimming, Felling, and Brushing

All tools and equipment shall be kept in first class working condition at all times.

11.2. Tree-man Saddle (if used)

This device with safety straps is designed for tree climber's safety and convenience. It shall be inspected frequently for general condition and wear. Tree-man saddles with safety straps shall not be stored with cutting tools.

11.3. Ladders:

Ladders shall be of sound construction and of non-conducting materials.

A ladder should be used in climbing trees where lower branches cannot be manually reached from the ground.

11.4. Power Saws:

Only chain type power saws of reputable, established brands and suitable capacity should be used. All rules, regulations, ordinances, and laws shall be adhered to for the safety of personnel and handling of fuel and lubricant associated with power saw work.

PPL companies
Transmission

11.5. Climbing line:

Rope is used extensively in tree work for lifting, pulling, and holding loads, also for climbing lines, hand lines, slings, and lashings.

It shall be approved No. 1 quality ½" diameter manila rope or equivalent when new, with whipped ends.

11.6. Care of Small Tools:

- Manual saws shall be kept sharpened and properly set.
- Pole pruners and axes shall be kept sharp and in good working order.
- Pruners, axes, and saws shall be safely laid to one side or stored when not in service.
- Pruning and pull or trim saws shall be carried in protective scabbards.
- Pruner poles should be kept clean to guard against moisture absorption and kept free of all surface splinters. Pruner head blade bolts, and rivets should be kept adjusted and oiled for free, smooth cutting.
- All cutting tools shall be dried and free of rust before storing in a dry place, with guards attached or in racks.
- An axe shall not be used as a sledge and shall be inspected daily for: loose, rough, or cracked handles; dull, nicked or split blade; and loose blade and loose wedge in eye. Faulty axes shall be reconditioned before further use.
- A tool shall not be used beyond its capacity.
- All tools should be accounted for daily.
- Care of Ladders:
- When stored on a truck, ladders should be securely fastened.
- Ladders should be removed from base of tree when not in use.
- Broken or seriously damaged rungs shall be replaced before further use.
- Side rails shall be kept smooth.
- A ladder with cracked or splintered side rails shall be promptly discarded.
- Care of Power Saws:
- Chain Type
  - Keep lubricated and in good cutting condition.
  - Perform touch-up sharpening with suitable file or hone.
  - Keep cutter teeth of equal length.
  - Keep correct tension on chain for safety and best cutting.
  - To avoid costly engine wear, replace dull chains promptly.
  - Avoid rocks, dirt, concrete and other damaging material.

11.7. Motors

- Use fuel only as recommended by manufacturer's manual.
- Blend oil and gasoline carefully before placing in fuel tank.
- Gasoline and oil shall never be separately placed in fuel tank.
- All parts requiring special lubrication shall be checked regularly.

- Clean and replace air filters as instructed by manufacturer's manual.
- Cylinder fins should be cleaned each two weeks or more often if needed.

11.8. General

When not in use, power saws must be laid in a safe place.

When stored on a truck, power saws shall be racked firmly and covered against damage and dust.

11.9. Backpack Sprayers with Hand Pump

This type of sprayer shall be of a safety (Special Fire Proof) approved design and used where herbicides are applied by manual methods.

- Capacity shall not exceed 5 gallons.
- Tank, pump, and hose shall be inspected frequently for leaks.
- Trigger and spray action shall shut off properly.
- Nozzle vent and screen shall be kept clean to insure proper operation.
- Tank should be flushed out daily.
- Sprayers shall not be store without thorough cleaning of nozzle, hose, pump and tank.

11.10. Power Chippers

When brush and tree volume requires three or more hours per day disposal effort or for other sound reasons, a mechanical chipper should be considered as part of tree crew equipment.

- Trailer type chippers are preferred.
- Manufacturer's instructions on diameter size and hardness of wood fed into hopper should be followed.
- Extreme care shall be practiced in keeping stones, metal and other foreign materials out of hopper.
- Major bearings should be greased daily.
- Motor oil and filters should be checked frequently and changed as called for by manufacturer's manual.
- Cutter knives shall be checked frequently for tightness and sharpness. Dull knives shall be changed promptly for safe, efficient work and to avoid excess engine wear.
- Protective goggles or equivalent shall be worn by workers feeding the chipper.
- Hearing protection shall be worn by the clipper operator.
- Wood shall not be fed into machine before motor is thoroughly warm.
- Machine shall be protected with shroud during bad weather and in outdoor storage.

11.11. Transportation

Vehicles of adequate capacity to perform the job assigned shall be provided.

PPL companies

Transmission

- Where power chippers are used in urban areas, a 300 cubic feet or larger, dust tight box may be substituted for the conventional truck bed.
- All trucks shall have built-in water proof storage space for tool storage and side racks for ladders and pruner poles.
- Trucks shall be maintained in sound, safe and efficient operating condition.
- All trucks shall have signage indicating it is a contractor for LGE-KU.

PPL companies

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

02/01/2011
Revised 02/19/2014
Revised 03/22/2016

Submitted by Ted Clawson, Kevin Montgomery

Transmission

Table of Contents

Transmission

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

1. Introduction

These Vegetation Practices, Approved Procedures and Specifications are preferred methods for performing vegetation work on the LGE-KU transmission system.

2. Aerial Spraying

Aerial herbicide treatment of transmission rights-of-way is the preferred method of maintenance. It is a highly technical and specialized technique and shall be performed by properly licensed applicators.

2.1. Liquid

Liquid applications shall be made only between the time of full leaf development and the first of September. Granular applications shall be made only after total leaf drop and prior to any leaf development.

2.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

2.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated. Spraying shall not be done when wind exceeds 5 miles per hour.

2.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

2.5. Brush and Tree Heights

Brush and trees should be a minimum of 5 feet high for best results in order to absorb a lethal quantity of herbicides.

Transmission

2.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

2.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

2.8. Spray Boom

The spray boom and mounting arrangement shall meet all application requirements and the spray boom, similar to the micro-foil, with 0.060 nozzles, shall maintain proper pressure for spray solution during complete applications.

2.9. Moisture Restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3. High Volume Foliar Application

HVF is best suited in areas of medium to heavy brush and tree density, particularly where aerial applications cannot be performed.

3.1. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

Transmission

3.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

3.5. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

3.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

3.8. Low Volume Foliar Application

LVF is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and clean up of resistant plants on r/w or where aerial application or high volume foliar application cannot be performed.

3.9. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.10. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.11. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

3.12. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most garden

Transmission

3.13. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.14. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

Spray solution shall be applied first at top of foliage working downward, wetting leaves.

Spray nozzle setting shall be varied by operator, from a Flat Fan Tip for brush less than 6 feet tall to an Adjustable Cone Tip adjusted to a straight stream for lacing on brush greater than 6 feet tall, to obtain sufficient wetting of each plant.

Brush and trees shall not be sprayed at a distance greater than 15 feet from the spray nozzle.

3.15. Moisture restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3.16. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

4. Low Volume Basal Application

LVB is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and clean up of resistant plants on r/w or where aerial application or high volume and low volume foliar applications can not be performed.

4.1. Application

Applications may be made in all seasons of the year when authorized and weather permitting, but is best suited for dormant season application. LVB is to be applied using backpack equipment.

Transmission

4.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

4.3. Spray Pattern

Spray nozzle shall be directed at base of plant and moved upward in a slow steady motion.

Spray solution shall be applied evenly to the point of run-off over the lower 18”-24” of stem, root collar and exposed roots.

Nozzle pressure shall be adequate for efficient distribution of solution without waste.

4.4. Brush and Tree Heights

Normally 5’-10’ on private rights-of-way and heights up to 15’-20’ where authorized.

Normally 4’-6’ along public roadsides.

Low growing herbaceous (ground cover) plants shall not be treated.

4.5. Weather Restrictions

Solution shall not be applied when brush or tree stem is wet from dew, fog, rain, or covered with ice or snow. Do not apply LVB when temperature is below freezing.

Solution shall not be applied when wind interferes with proper spray pattern.

5. Cut Stubble Application

A soil active product best suited following mowing of R/W and prior to vigorous re-growth.

5.1. Application

Application shall be only when the temperature is above freezing. However, do not apply when the ground is frozen, or heavily saturated after rainfall.

5.2. Formulation

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

5.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

Transmission

5.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

5.5. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

6. Stump Treatment

To be applied to the cut surface area following hand cutting.

6.1. Application

Application can be made in all seasons of the year, except during sap flow, to deciduous species when weather permits.

6.2. Formulation

Same as basal spraying.

6.3. Timing and Spray Solution

Shall be applied when clearing has occurred along transmission R/W. Water based mix must be applied within one hour following cutting, and oil based mixture should be applied as soon as possible following cutting, but no longer than 4 hours. The cambium layer will be treated completely around the circumference of the stump.

6.4. Spray Equipment

May be applied with backpack sprayer, or even hand type sprayers.

7. Brush and Tree Control Notification and Agreement

Before manual, mechanical, or herbicide brush work is begun, agreed to work shall be clearly communicated by Company representative to Contractor's representative. Nearby property owners may need to be notified of work plan and schedule.

When necessary to do so, a qualified representative of the Contractor shall procure rights for work on private property, Federal, State, and County road rights-of-way. If required in special cases, a Company representative may assist.

Transmission

Contractor crew foreman shall notify and secure agreement from adjacent property owners for scheduled brush and tree work on and along public roads.

During the performance of applying herbicides, special care shall be exercised to assure that no damage will occur to livestock and crops, and insure that no herbicide is misapplied nor left un-attended.

8. Mowing and Shredding

Mowing and tree shredding is used to clear easements and reclaim the edges of the rights-of-way.

8.1 Equipment

Specific equipment to be used on the right-of-way to mow, mulch or side trim the edges shall be determined by the size and type of vegetation and the terrain to be mowed.

8.2 Types of Equipment

- Kershaw or equivalent with Fecon rotary mower
- 4X4 Heavy Duty Tractor with Bush Hog
- Excavator with Tree Shredder attachment
- Excavator with Fecon Rotary attachment
- Skytrim or Jarraffe type, (75’ boom with 24” saw attachment)

9. Resistant Species

Due to basic plant characteristics and probability rate of plant food assimilation, certain brush and tree species may not react quickly to foliage treatment. Alternative methods may be recommended by Company.

9.1. Coniferous Species

Where coniferous (retain live needles or leaves year round) plants are a brush or tree control problem, Company shall provide approval of methods for treating these species.

9.2. Caution

To obtain maximum effect from herbicides, foliage and basal spray treated brush and trees shall not be cut or otherwise disturbed for a minimum period of one year.

Transmission

10. Brush and Tree Disposal and Site Clean Up

This section deals with the time consuming and often difficult problem of brush and tree disposal from work performed on public and private property. The average property owner expects a site left in as orderly a condition as when work began. Public agencies will not permit littering of public places.

10.1. Tree Work Clean Up

In the interest of sanitation, safety and orderliness, most local, county, and state governments have regulations against the abandonment or dumping of any foreign materials in public places. Many municipalities provide landfills and regulate their use. Such facilities should be used when conveniently close to tree work operations. Regardless of method s employed to meet local circumstances, Contract supervisors shall not risk any Company or personal liability in brush and tree disposal.

- All severed limbs and branches shall be removed from trimmed trees.
- Tools and ropes shall be removed from trees and ladders placed aside.
- Brush Handling
- Brush and wood should be moved off travel ways and sidewalks as same reaches the ground and in a manner not to unnecessarily inconvenience the traveling public.
- When a tree is completed, brush should be promptly loaded on the truck or fed into a power chipper.

10.2. General

- Wood and brush shall not be stored in public places over night without permission.
- In rural areas, brush and wood may be disposed of in accordance with property owners wishes except same must not be left on road rights-of-way.
- All urban and suburban sites shall be thoroughly cleaned.
- Lawns, parkways, and sidewalks shall be cleaned of leaves, twigs, and litter.
- Care shall be taken not to damage any of the property owner’s facilities.
- Where wood and brush is discarded at landfills, all regulations shall be complied with.
- Loaded brush shall not extend beyond truck bed sides and if more than 4’ over rear end, same shall carry a red flag.
- Where permissible by rural property owners and public highway regulations, debris from power chippers may be blown on the rights-of-way or into the woods.
- Chips left at the site shall be thinly scattered to leave no objectionable bulk or may be stacked or bagged as agreed to by the property owner.
- Brush and tree wood should be disposed of in the most economical manner in accordance with all regulations and laws.
- Avoid unnecessary handling and hauling. Burning of brush and trees is generally not allowed.

Transmission

10.3. Poisonous Plants

Tree workers should be able to readily identify poisonous plants, such as poison ivy, poison oak, and poison sumac, since contact with this plant can cause skin rash and extreme swelling. Workers should also be able to identify wild cherry and buckeye and take necessary precautions to insure that livestock will not have the opportunity to eat the leaves of these trees following cutting or herbicide treatment.

11. Tools and Equipment

This section deals with Contractor's selection, use and care of tools and equipment for line clearing operations. Suitable Contractor equipment, maintained in good working condition, makes tree work easier for workers and yields best results.

11.1. Clearing, Removal, Trimming, Felling, and Brushing

All tools and equipment shall be kept in first class working condition at all times.

11.2. Tree-man Saddle (if used)

This device with safety straps is designed for tree climber's safety and convenience. It shall be inspected frequently for general condition and wear. Tree-man saddles with safety straps shall not be stored with cutting tools.

11.3. Ladders:

Ladders shall be of sound construction and of non-conducting materials.

A ladder should be used in climbing trees where lower branches cannot be manually reached from the ground.

11.4. Power Saws:

Only chain type power saws of reputable, established brands and suitable capacity should be used. All rules, regulations, ordinances, and laws shall be adhered to for the safety of personnel and handling of fuel and lubricant associated with power saw work.

11.5. Climbing line:

Rope is used extensively in tree work for lifting, pulling, and holding loads, also for climbing lines, hand lines, slings, and lashings.

It shall be approved No. 1 quality ½" diameter manila rope or equivalent when new, with whipped ends.

Transmission

11.6. Care of Small Tools:

- Manual saws shall be kept sharpened and properly set.
- Pole pruners and axes shall be kept sharp and in good working order.
- Pruners, axes, and saws shall be safely laid to one side or stored when not in service.
- Pruning and pull or trim saws shall be carried in protective scabbards.
- Pruner poles should be kept clean to guard against moisture absorption and kept free of all surface splinters. Pruner head blade bolts, and rivets should be kept adjusted and oiled for free, smooth cutting.
- All cutting tools shall be dried and free of rust before storing in a dry place, with guards attached or in racks.
- An axe shall not be used as a sledge and shall be inspected daily for: loose, rough, or cracked handles; dull, nicked or split blade; and loose blade and loose wedge in eye. Faulty axes shall be reconditioned before further use.
- A tool shall not be used beyond its capacity.
- All tools should be accounted for daily.
- Care of Ladders:
- When stored on a truck, ladders should be securely fastened.
- Ladders should be removed from base of tree when not in use.
- Broken or seriously damaged rungs shall be replaced before further use.
- Side rails shall be kept smooth.
- A ladder with cracked or splintered side rails shall be promptly discarded.
- Care of Power Saws:
- Chain Type
  - Keep lubricated and in good cutting condition.
  - Perform touch-up sharpening with suitable file or hone.
  - Keep cutter teeth of equal length.
  - Keep correct tension on chain for safety and best cutting.
  - To avoid costly engine wear, replace dull chains promptly.
  - Avoid rocks, dirt, concrete and other damaging material.

11.7. Motors

- Use fuel only as recommended by manufacturer’s manual.
- Blend oil and gasoline carefully before placing in fuel tank.
- Gasoline and oil shall never be separately placed in fuel tank.
- All parts requiring special lubrication shall be checked regularly.
- Clean and replace air filters as instructed by manufacturer’s manual.
- Cylinder fins should be cleaned each two weeks or more often if needed.

11.8. General

When not in use, power saws must be laid in a safe place.

Transmission

When stored on a truck, power saws shall be racked firmly and covered against damage and dust.

11.9. Backpack Sprayers with Hand Pump

This type of sprayer shall be of a safety (Special Fire Proof) approved design and used where herbicides are applied by manual methods.

- Capacity shall not exceed 5 gallons.
- Tank, pump, and hose shall be inspected frequently for leaks.
- Trigger and spray action shall shut off properly.
- Nozzle vent and screen shall be kept clean to insure proper operation.
- Tank should be flushed out daily.
- Sprayers shall not be store without thorough cleaning of nozzle, hose, pump and tank.

11.10. Power Chippers

When brush and tree volume requires three or more hours per day disposal effort or for other sound reasons, a mechanical chipper should be considered as part of tree crew equipment.

- Trailer type chippers are preferred.
- Manufacturer's instructions on diameter size and hardness of wood fed into hopper should be followed.
- Extreme care shall be practiced in keeping stones, metal and other foreign materials out of hopper.
- Major bearings should be greased daily.
- Motor oil and filters should be checked frequently and changed as called for by manufacturer's manual.
- Cutter knives shall be checked frequently for tightness and sharpness. Dull knives shall be changed promptly for safe, efficient work and to avoid excess engine wear.
- Protective goggles or equivalent shall be worn by workers feeding the chipper.
- Hearing protection shall be worn by the clipper operator.
- Wood shall not be fed into machine before motor is thoroughly warm.
- Machine shall be protected with shroud during bad weather and in outdoor storage.

11.11. Transportation

Vehicles of adequate capacity to perform the job assigned shall be provided.

- Where power chippers are used in urban areas, a 300 cubic feet or larger, dust tight box may be substituted for the conventional truck bed.
- All trucks shall have built-in water proof storage space for tool storage and side racks for ladders and pruner poles.
- Trucks shall be maintained in sound, safe and efficient operating condition.
- All trucks shall have a magnetic sign on at least the drivers' door indicating it is a contractor for KU/LG&E.

PPL companies

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

02/01/2011

Submitted by (David Comstock, Ted Clawson, John Philpot)

PPL companies

Transmission

Table of Contents

PPL companies

Transmission

PPL companies

Transmission

VEGETATION PRACTICES, APPROVED PROCEDURES, AND SPECIFICATIONS

1. Introduction

This section should provide information on the report's purpose, scope and format along with a project description. If the introduction is short, include as part of the discussion rather than on a separate page.

2. Aerial Spraying

Aerial herbicide treatment of transmission rights-of-way is the preferred method of maintenance. It is a highly technical and specialized technique and shall be performed by properly licensed applicators.

2.1. Liquid

Liquid applications shall be made only between the time of full leaf development and the first of September. Granular applications shall be made only after total leaf drop and prior to any leaf development.

2.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

2.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated. Spraying shall not be done when wind exceeds 5 miles per hour.

2.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

2.5. Brush and Tree Heights

Brush and trees should be a minimum of 5 feet high for best results in order to absorb a lethal quantity of herbicides.

PPL companies
Transmission

2.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

2.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

2.8. Spray Boom

The spray boom and mounting arrangement shall meet all application requirements and the spray boom, similar to the micro-foil, with 0.060 nozzles, shall maintain proper pressure for spray solution during complete applications.

2.9. Moisture Restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3. High Volume Foliar Application

HVF is best suited in areas of medium to heavy brush and tree density, particularly where aerial applications cannot be performed.

3.1. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

PPL companies
Transmission

3.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

3.5. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.6. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

3.7. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

3.8. Low Volume Foliar Application

LVF is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and clean up of resistant plants on r/w or where aerial application or high volume foliar application cannot be performed.

3.9. Application

Liquid application shall be made only between the time of full leaf development and the first of October.

3.10. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

3.11. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

3.12. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most garden

PPL companies

Transmission

3.13. Brush and Tree Heights

Brush and trees should be a maximum of 15 feet high for best results in order to absorb a lethal quantity of herbicides.

3.14. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

Spray solution shall be applied first at top of foliage working downward, wetting leaves.

Spray nozzle setting shall be varied by operator, from a Flat Fan Tip for brush less than 6 feet tall to an Adjustable Cone Tip adjusted to a straight stream for lacing on brush greater than 6 feet tall, to obtain sufficient wetting of each plant.

Brush and trees shall not be sprayed at a distance greater than 15 feet from the spray nozzle.

3.15. Moisture restrictions

Spray solution shall not be applied within 30 minutes after a fog, dew, or rain heavy enough to cause run-off from leaves.

Spraying done 4 hours or less prior to such fog, dew, or rain shall be redone.

3.16. Solution Preparation

The spray solution shall be prepared as specified by the manufacturer's label being sure the solution is thoroughly mixed and agitated, while filling sprayer and being applied. All label directions shall be followed when mixing.

4. Low Volume Basal Application

LVB is best suited in areas where brush and tree density is low, particularly scattered stems along public highways, fence rows, and ditch banks and clean up of resistant plants on r/w or where aerial application or high volume and low volume foliar applications can not be performed.

4.1. Application

Applications may be made in all seasons of the year when authorized and weather permitting, but is best suited for dormant season application. LVB is to be applied using backpack equipment.

PPL companies
Transmission

4.2. Formulations

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

4.3. Spray Pattern

Spray nozzle shall be directed at base of plant and moved upward in a slow steady motion.

Spray solution shall be applied evenly to the point of run-off over the lower 18”-24” of stem, root collar and exposed roots.

Nozzle pressure shall be adequate for efficient distribution of solution without waste.

4.4. Brush and Tree Heights

Normally 5’-10’ on private rights-of-way and heights up to 15’-20’ where authorized.

Normally 4’-6’ along public roadsides.

Low growing herbaceous (ground cover) plants shall not be treated.

4.5. Weather Restrictions

Solution shall not be applied when brush or tree stem is wet from dew, fog, rain, or covered with ice or snow. Do not apply LVB when temperature is below freezing.

Solution shall not be applied when wind interferes with proper spray pattern.

5. Cut Stubble Application

A soil active product best suited following mowing of R/W and prior to vigorous re-growth.

5.1. Application

Application shall be only when the temperature is above freezing. However, do not apply when the ground is frozen, or heavily saturated after rainfall.

5.2. Formulation

Only EPA approved herbicide mixtures approved by TRWC, shall be used in all foliage spraying for plant control. Label directions shall be followed at all times.

5.3. Wind

Extreme care shall be used to guard against drift of material off the area intended to be treated.

PPL companies
Transmission

5.4. Crops Most Susceptible to Herbicides

Tobacco, tomatoes, grapes, beans, peas, clover, oats, soybeans, corn, cotton, buckwheat, flax, sugar beets, annual garden flowers, and most gardens.

5.5. Spray Pattern

The spray solution shall be applied as specified by the manufacturer's label using the spray consistency approved by TRWC.

6. Stump Treatment

To be applied to the cut surface area following hand cutting.

6.1. Application

Application can be made in all seasons of the year, except during sap flow, to deciduous species when weather permits.

6.2. Formulation

Same as basal spraying.

6.3. Timing and Spray Solution

Shall be applied when clearing has occurred along transmission R/W. Water based mix must be applied within one hour following cutting, and oil based mixture should be applied as soon as possible following cutting, but no longer than 4 hours. The cambium layer will be treated completely around the circumference of the stump.

6.4. Spray Equipment

May be applied with backpack sprayer, or even hand type sprayers.

7. Brush and Tree Control Notification and Agreement

Before manual, mechanical, or herbicide brush work is begun, agreed to work shall be clearly communicated by Company representative to Contractor's representative. Nearby property owners may need to be notified of work plan and schedule.

When necessary to do so, a qualified representative of the Contractor shall procure rights for work on private property, Federal, State, and County road rights-of-way. If required in special cases, a Company representative may assist.

PPL companies

Transmission

Contractor crew foreman shall notify and secure agreement from adjacent property owners for scheduled brush and tree work on and along public roads.

During the performance of applying herbicides, special care shall be exercised to assure that no damage will occur to livestock and crops, and insure that no herbicide is misapplied nor left un-attended.

8. Resistant Species

Due to basic plant characteristics and probability rate of pant food assimilation, certain brush and tree species may not react quickly to foliage treatment. Alternative methods may be recommended by Company.

8.1. Coniferous Species:

Where coniferous (retain live needles or leaves year round) plants are a brush or tree control problem, Company shall provide approval of methods for treating these species.

8.2. Caution:

To obtain maximum effect from herbicides, foliage and basal spray treated brush and trees shall not be cut or otherwise disturbed for a minimum period of one year.

9. BRUSH AND TREE DISPOSAL AND SITE CLEAN UP

This section deals with the time consuming and often difficult problem of brush and tree disposal from work performed on public and private property. The average property owner expects a site left in as orderly a condition as when work began. Public agencies will not permit littering of public places.

9.1. Tree Work Clean Up

In the interest of sanitation, safety and orderliness, most local, county, and state governments have regulations against the abandonment or dumping of any foreign materials in public places. Many municipalities provide landfills and regulate their use. Such facilities should be used when conveniently close to tree work operations. Regardless of method s employed to meet local circumstances, Contract supervisors shall not risk any Company or personal liability in brush and tree disposal.

- All served limbs and branches shall be removed from trimmed trees.
- Tools and ropes shall be removed from trees and ladders placed aside.
- Brush Handling

- Brush and wood should be moved off travel ways and sidewalks as same reaches the ground and in a manner not to unnecessarily inconvenience the traveling public.
- When a tree is completed, brush should be promptly loaded on the truck or fed into a power chipper.

9.2. General

- Wood and brush shall not be stored in public places over night without permission.
- In rural areas, brush and wood may be disposed of in accordance with property owners wishes except same must not be left on road rights-of-way.
- All urban and suburban sites shall be thoroughly cleaned.
- Lawns, parkways, and sidewalks shall be cleaned of leaves, twigs, and litter.
- Care shall be taken not to damage any of the property owner's facilities.
- Where wood and brush is discarded at landfills, all regulations shall be complied with.
- Loaded brush shall not extend beyond truck bed sides and if more than 4' over rear end, same shall carry a red flag.
- Where permissible by rural property owners and public highway regulations, debris from power chippers may be blown on the rights-of-way or into the woods.
- Chips left at the site shall be thinly scattered to leave no objectionable bulk or may be stacked or bagged as agreed to by the property owner.
- Brush and tree wood should be disposed of in the most economical manner in accordance with all regulations and laws.
- Avoid unnecessary handling and hauling. Burning of brush and trees is generally not allowed.

9.3. Poisonous Plants

Tree workers should be able to readily identify poisonous plants, such as poison ivy, poison oak, and poison sumac, since contact with this plant can cause skin rash and extreme swelling. Workers should also be able to identify wild cherry and buckeye and take necessary precautions to insure that livestock will not have the opportunity to eat the leaves of these trees following cutting or herbicide treatment.

10.EQUIPMENT

This section deals with Contractor's selection, use and care of tools and equipment for line clearing operations. Suitable Contractor equipment, maintained in good working condition, makes tree work easier for workers and yields best results.

10.1. Standard Equipment

10.2. Clearing, Removal, Trimming, Felling, and Brushing

All tools and equipment shall be kept in first class working condition at all times.

PPL companies
Transmission

10.3. Tree-man Saddle (if used)

This device with safety straps is designed for tree climber's safety and convenience. It shall be inspected frequently for general condition and wear. Treeman saddles with safety straps shall not be stored with cutting tools.

10.4. Ladders:

Ladders shall be of sound construction and of non-conducting materials.

A ladder should be used in climbing trees where lower branches cannot be manually reached from the ground.

10.5. Power Saws:

Only chain type power saws of reputable, established brands and suitable capacity should be used. All rules, regulations, ordinances, and laws shall be adhered to for the safety of personnel and handling of fuel and lubricant associated with power saw work.

11.Rope

Rope is used extensively in tree work for lifting, pulling, and holding loads, also for climbing lines, hand lines, slings, and lashings.

11.1. Climbing line:

This line is a rope to secure climbers in trees.

It shall be approved No. 1 quality ½" diameter manila rope or equivalent when new, with whipped ends.

11.2. Care of Small Tools:

- Manual saws shall be kept sharpened and properly set.
- Pole pruners and axes shall be kept sharp and in good working order.
- Pruners, axes, and saws shall be safely laid to one side or stored when not in service.
- Pruning and pull or trim saws shall be carried in protective scabbards.
- Pruner poles should be kept clean to guard against moisture absorption and kept free of all surface splinters. Pruner head blade bolts, and rivets should be kept adjusted and oiled for free, smooth cutting.
- All cutting tools shall be dried and free of rust before storing in a dry place, with guards attached or in racks.
- An axe shall not be used as a sledge and shall be inspected daily for: loose, rough, or cracked handles; dull, nicked or split blade; and loose blade and loose wedge in eye. Faulty axes shall be reconditioned before further use.

- A tool shall not be used beyond its capacity.
- All tools should be accounted for daily.
- Care of Ladders:
- When stored on a truck, ladders should be securely fastened.
- Ladders should be removed from base of tree when not in use.
- Broken or seriously damaged rungs shall be replaced before further use.
- Side rails shall be kept smooth.
- A ladder with cracked or splintered side rails shall be promptly discarded.
- Care of Power Saws:
- Chain Type
  - Keep lubricated and in good cutting condition.
  - Perform touch-up sharpening with suitable file or hone.
  - Keep cutter teeth of equal length.
  - Keep correct tension on chain for safety and best cutting.
  - To avoid costly engine wear, replace dull chains promptly.
  - Avoid rocks, dirt, concrete and other damaging material.

11.3. Motors

- Use fuel only as recommended by manufacturer's manual.
- Blend oil and gasoline carefully before placing in fuel tank.
- Gasoline and oil shall never be separately placed in fuel tank.
- All parts requiring special lubrication shall be checked regularly.
- Clean and replace air filters as instructed by manufacturer's manual.
- Cylinder fins should be cleaned each two weeks or more often if needed.

11.4. General

When not in use, power saws must be laid in a safe place.

When stored on a truck, power saws shall be racked firmly and covered against damage and dust.

11.5. Backpack Sprayers with Hand Pump

This type of sprayer shall be of a safety (Special Fire Proof) approved design and used where herbicides are applied by manual methods.

- Capacity shall not exceed 5 gallons.
- Tank, pump, and hose shall be inspected frequently for leaks.
- Trigger and spray action shall shut off properly.
- Nozzle vent and screen shall be kept clean to insure proper operation.
- Tank should be flushed out daily.
- Sprayers shall not be store without thorough cleaning of nozzle, hose, pump and tank.

PPL companies

Transmission

11.6. Power Chippers

When brush and tree volume requires three or more hours per day disposal effort or for other sound reasons, a mechanical chipper should be considered as part of tree crew equipment.

- Trailer type chippers are preferred.
- Manufacturer's instructions on diameter size and hardness of wood fed into hopper should be followed.
- Extreme care shall be practiced in keeping stones, metal and other foreign materials out of hopper.
- Major bearings should be greased daily.
- Motor oil and filters should be checked frequently and changed as called for by manufacturer's manual.
- Cutter knives shall be checked frequently for tightness and sharpness. Dull knives shall be changed promptly for safe, efficient work and to avoid excess engine wear.
- Protective goggles or equivalent shall be worn by workers feeding the chipper.
- Hearing protection shall be worn by the clipper operator.
- Wood shall not be fed into machine before motor is thoroughly warm.
- Machine shall be protected with shroud during bad weather and in outdoor storage.

11.7. Transportation

Vehicles of adequate capacity to perform the job assigned shall be provided.

- Where power chippers are used in urban areas, a 300 cubic feet or larger, dust tight box may be substituted for the conventional truck bed.
- All trucks shall have built-in water proof storage space for tool storage and side racks for ladders and pruner poles.
- Trucks shall be maintained in sound, safe and efficient operating condition.
- All trucks shall have a magnetic sign on at least the drivers' door indicating it is a contractor for KU/LG&E.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 84

Responding Witness: Lonnie E. Bellar

Q-84. Please refer to the testimony of Lonnie Bellar in response to the question at line 6, page 5.

a. Please provide a copy of all written instructions, directives, and emails sent to employees and/or contractors related to the current 5-year cycled approach.

b. Please provide a copy of the Transmission System Infrastructure Plan ("TSIP") (2016) currently in effect at this time.

c. Prior to 2016, did the Company have a written TSIP that included vegetation management? If so, please provide a copy of same.

d. Was the 2016 TSIP the first such written plan?

e. Please describe the "just-in-time" plan previously in place for transmission line maintenance.

f. How are "hazard trees" defined?

A-84.

a. See attached.

b. The Transmission System Improvement Plan (2017-2021) ("TSIP") was filed as Exhibit PWT-2 in Case Nos. 2016-00370 and 2016-00371.[6] The TSIP is still in effect at this time.

c. No.

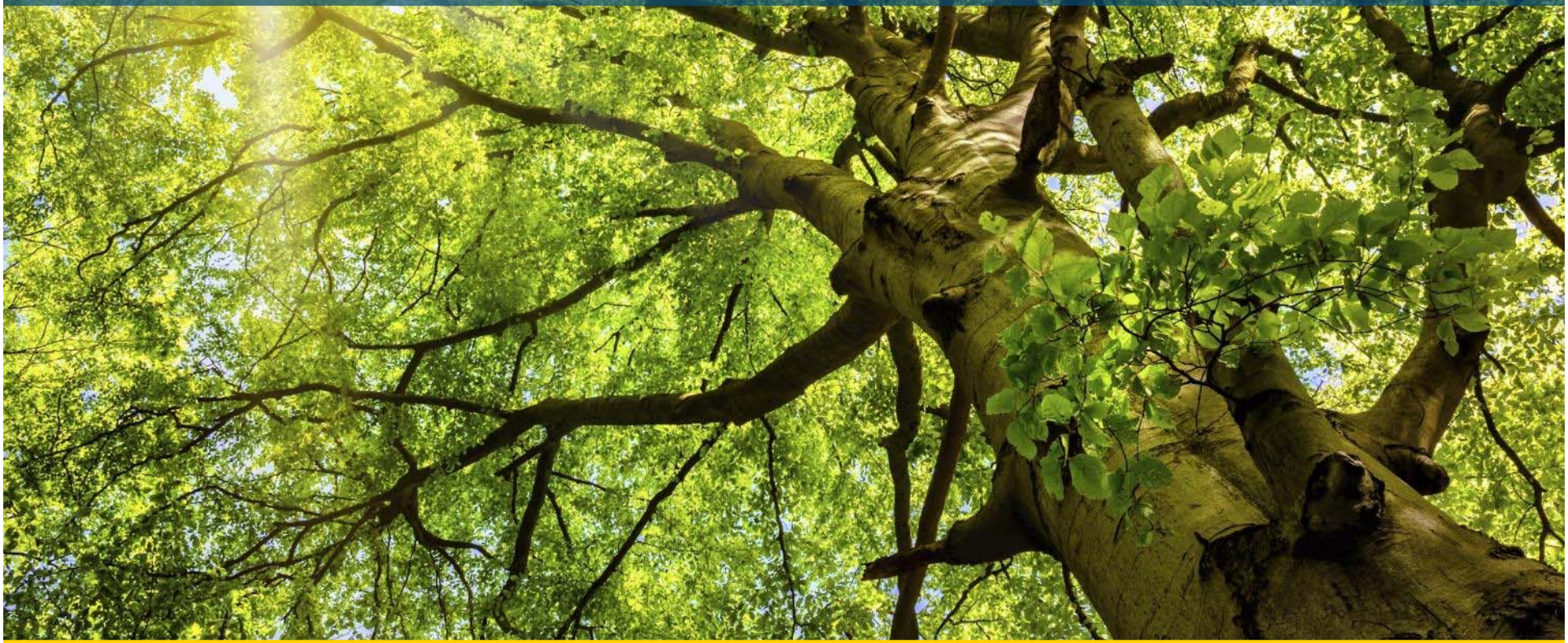
[6] In the Matter of: Application of Kentucky Utilities Company for an Adjustment of its Electric Rates and for Certificates of Public Convenience and Necessity, Case No. 2016-00370 and In the Matter of: Application of Louisville Gas and Electric Company for an Adjustment of its Electric and Gas Rates and for Certificates of Public Convenience and Necessity, Case No. 2016-00371.

d. Yes.

e. See page 20 of Exhibit PWT-2 as referenced in response b above.

f. Hazard trees are defined as diseased or dying trees that are at risk for causing a circuit interruption.

Transmission Cycle Based Line Clearing



Adam Smith
Mgr Transmission Line Svcs

LG&E KU
PPL companies

Program Overview

- 2014 Program Assessment
- Included in Transmission System Improvement Plan
- Cycle based approach
- Hazard tree program
- ~$15M annual funding
- ~35 contract crews (100 FTEs)
- First Cycle Timing
  — July 2017 – June 2022

Cycle Based Process

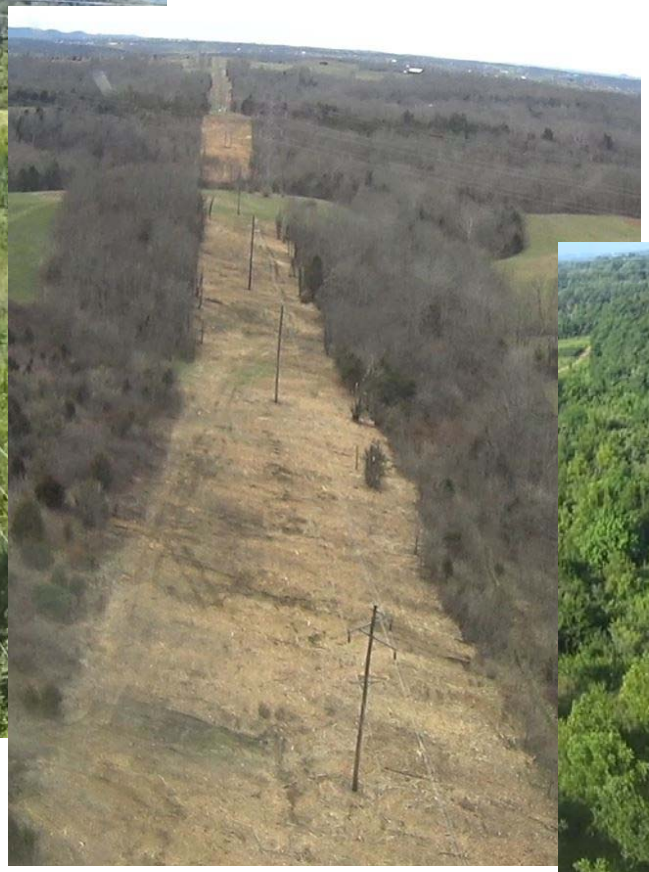
1. Reclaim

2. Establish

3. Sustain

Lancaster – Stanford 69kV

1. Reclaim

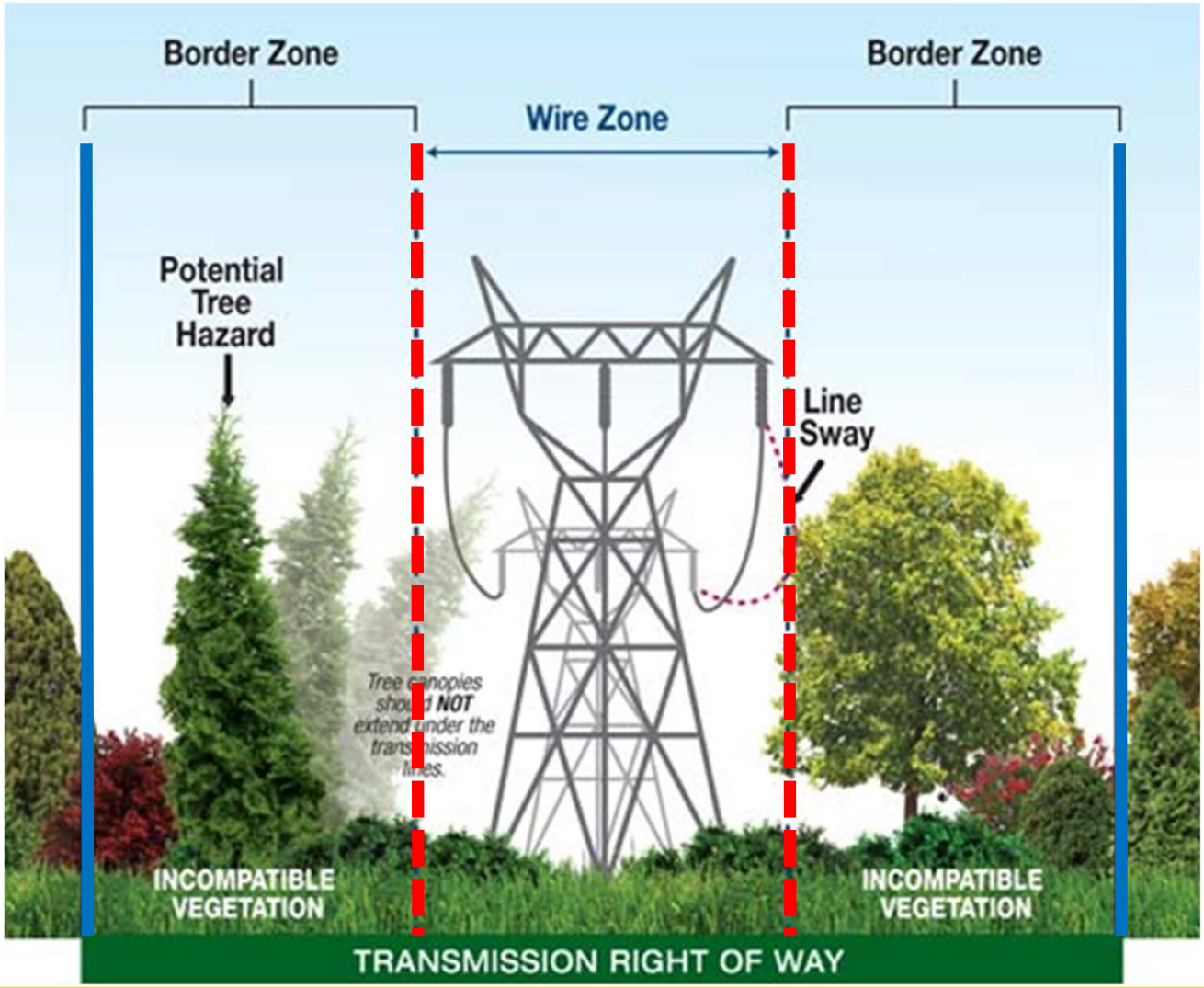


2. Establish

3. Sustain

“Hot Spot” Photos

Approach for Yard Trees
Wire Zone and Border Zone



Customer Experience

- Property owner concerns
- Community impacts
- Program mitigation

Project Team

- Corporate Communications
- Customer Experience
- Corporate Responsibility
- Distribution Vegetation
- Environmental Affairs
- External Affairs
- Legal
- Rates and Regulatory

Communication Plan

- Dedicated phone and email address
- Customer letter and brochure
- Project webpage
- Elected official outreach
- PSC awareness (customer complaints)
- Community organizations outreach
- Employee outreach
- Customer experience talking points
- Customer service talking points

PPL companies

Cycle-based Transmission Clearance Program Communications Plan
Pleasant Grove to Watterson (LG&E)

Summary/Background

As part of ongoing work to strengthen the safety and reliability of the system, Louisville Gas and Electric Company and Kentucky Utilities Company are conducting tree trimming around transmission infrastructure across the utilities' service territories. These efforts will enable the utilities to further enhance service to customers by minimizing the potential for service interruptions and large scale outages. Consistent with regulatory requirements, LG&E and KU routinely work to maintain areas around transmission infrastructure and rights of way to ensure trees cannot get near or fall into high-voltage transmission lines. The utilities' cycle-based approach for these efforts are industry best practices for maintaining transmission infrastructure and is part of the utilities' proactive method for keeping trees in these areas a safe distance from transmission lines. Along with other infrastructure upgrades being conducted by the utility, these efforts are expected to significantly reduce the duration of outages experienced by customers, reduce associated costs and ensure a safe, reliable system well into the future.

The first Louisville project in this program will cover a 16 mile stretch of transmission line running from LG&E's Pleasant Grove substation along Highway 44 in Mt. Washington to the utility's Watterson substation at Hurstbourne Lane and Bardstown Road. Details on this section include the following:

- The Pleasant Grove to Watterson section project of this program involves clearance around 16 miles of 69 and 138 kV transmission line and infrastructure.
- Just over 300 customers, primarily residential and a few businesses, are along this section of transmission line.
- Easement widths along this line are 50 feet (13.5 miles) and 150 feet (2.5 miles)

This work is tentatively scheduled to take place between April and November of 2019.

Objectives

- Communicate effective and timely messages to relevant audiences through each phase of the program to ensure all parties are aware of these project efforts, the benefits of this work and the company's ongoing commitment to safe, reliable service, as well as the environment.
- Maintain a focus on customers to minimize the impact of, and any inconvenience associated with, the work.
- Ensure employees, including those living and working in the project areas, are informed and able to act as company ambassadors or connect with the appropriate person(s) should they receive any questions about the project.

PPL companies

- Reinforce the company's commitment to investing in its infrastructure to ensure safe, reliable service now and into the future which, in turn, helps to keep Kentucky an attractive place to live and work.

Audiences

- Customers along trimming routes – including those customers below
  - Charlie Vettner Park and Golf Course
  - Wethington Nursery
- Adjacent neighborhoods/property owners/tenants living in or around the project area
  - 10 estimated HOA's including:
  - Silver Oaks
  - Mary Dell (Cannot make our name from Google Earth)
  - Billtown farms (4 residents affected)
  - Equinox
  - Cedar Ridge Estates
  - Woods Mt. Washington
  - Woodlake
  - Bethel Branch
- City/state/neighborhood elected officials, community representatives
  - Jeffersontown Mayor Bill Dieruf
  - District 11 Councilman Kevin Kramer
  - District 20 Councilman Stuart Benson
  - District 22 Councilwoman Robin Engel
  - Bullitt County Judge Exec. Jerry Summers
  - Spencer County Judge Exec. John Riley
- Regulatory agencies
- Business partners who will be performing the work
- Tree/vegetation related community organizations that may have interest/concern
- Employees who live or work within the project area
- Local organizations (ex. Trees Louisville, other for each line)
- Media (as necessary)

Key Messages

(Same as overall program talking points)

- As part of ongoing work to strengthen the safety and reliability of the system, Louisville Gas and Electric Company and Kentucky Utilities Company are conducting tree trimming and clearance efforts around transmission infrastructure across the utilities' service territories.

- These efforts will enable the utilities to further enhance service to customers by minimizing the potential for service interruptions and large-scale outages.

PPL companies

- These efforts will also help to further protect the system from the impacts of conditions similar to those seen during historic storms that hit the LG&E and KU service territories in 2018.

- For context, transmission lines are essentially multi-lane energy highways that carry electricity to substations where the voltage is stepped down before being transported through distribution lines, which serve as secondary roads and side streets carrying electricity into neighborhoods and commercial areas.

- When outages occur within a transmission system, they can have widespread, large-scale impacts - like the Northeast Blackout of 2003. The blackout occurred when a tree branch came into contact with a high-voltage electric transmission line. While there were multiple contributing issues, the vegetation issue was the most significant cause. Since that time, there have been reliability standards developed to mitigate the issues. Line clearing of vegetation is a primary focus of those reliability standards.

  Minimizing the potential for these types of large-scale outages is one of many reasons keeping transmission systems up to date is so critical. This project will allow KU to further strengthen electric reliability for our customers and the entire region.

- Consistent with regulatory requirements, LG&E and KU routinely work to maintain areas around transmission infrastructure and rights of way to ensure trees cannot get near or fall into high voltage transmission lines.

- The cycle-based approach for these efforts is an industry best practice for maintaining transmission infrastructure and is part of our proactive method for keeping trees in these areas a safe distance from transmission lines.

- The average cycle established for Transmission related tree trimming and clearance work is every 5 years, with the exception of those lines demonstrating the need for more frequent trimming. As part of this approach, some trees will be removed from areas we have not cleared in the recent past.

- Crews will be working in the utility easements to remove or trim trees that have the potential to make contact with the lines.

- Though this work will take place in the utilities' easements, there are some areas where it will be necessary for crews to cross a portion of some yards to access the work area. In some of these locations, we will need to temporarily remove fences and install temporary matting to provide a stable path for construction vehicles and to minimize the potential for rutting.

PPL companies

- An on-site crew member will communicate with property owners whose yards will need to be crossed or whose fences will need to be removed. These crew members will be happy to address any concerns you have and/or make any accommodations before starting the work in your area. Once the work in the area is completed, we will take steps to replace the fences and restore property to its current – or better – condition.

- Along with other infrastructure upgrades being conducted by the utility, these efforts are expected to reduce the frequency and duration of outages experienced by customers, reduce the associated costs and ensure a safe, reliable system far into the future.

- Other enhancements currently underway across LG&E and KU's high-voltage transmission system include replacing aging equipment such as wooden poles, cross arms, insulators, lines and substation controls; and installing smart restoration-detection equipment.

- The safety of the general public, as well as our employees and crews working on our behalf is our top priority.

- Crews working in the project areas will be using heavy equipment, such as backhoes, cranes and specialized tree removal equipment.

- There may be times when equipment will be left in the area overnight and on weekends. We ask that you keep children and pets away from the work area and any equipment that may remain on site during the project.

- In addition, we ask that you be mindful of our crews' presence as you drive through the area over the coming weeks.

- For your awareness and safety, our employees and contractors drive vehicles marked with the LG&E and KU logo.

- Prior to beginning this work, letters communicating details of the project are being sent to property and business owners within the project areas. Details of the work are also being communicated to area representatives.

  In addition, certified arborists working on the project are making personal visits to owners of properties along the project route to discuss the work to be done and any concerns or further arrangements necessary in advance of the work.

PPL companies

- While this tree trimming work is a critical part of maintaining the system, LG&E and KU are committed to enhancing the environment and landscape across the communities we serve.
    - o
    - o
    - o More than 40,000 trees have been planted across the LG&E and KU service territories as part of the company's Plant for the Planet Grant program;
    - o Since 1981, the company has donated more than 760,000 tree seedlings for planting across the service territories through its annual tree seedling giveaways;
    - o And the company has contributed more than $300,000 to tree planting efforts across the state.

Tactics (Timing TBD):
Internal

- CUSTOMER EXPERIENCE webpage talking points
- TARGETED EMAIL - to be sent to employees who live/work within the identified work area(s)
- BUSINESS SERVICE/CUSTOMER SERVICE talking points
- CE CONTRACTOR MEETING

External

- DEDICATED PHONE AND EMAIL ADDRESS – to be provided to customers to contact project representatives with questions
- BROCHURES (single utility)– containing project details and Q&A of commonly asked questions
- PROJECT WEBPAGE – to be created on company website and provided to customers, business partners and others as a place to stay up-to-date and refer others to information on work
- LETTERS (single utility) - w/brochure and contact info referenced above, to customers who live along the route of the project
- DOOR HANGERS (single utility)– to be considered for leaving in all urban/suburban neighborhoods impacted
- TALKING POINTS - to Media Relations/Customer Service/Customer Experience/Outreach teams

PPL companies

- POWER SOURCE NEWSLETTER – small blurb targeted to customers, providing high level information on tree-trimming/Transmission system improvement work.

- TARGETED CUSTOMER COMMITMENT WORK – (as needed) to address potential inquiries/complaints

- OTHER TACTICS – (as needed/identified)

Project/Project Communications Timing (Tentative)
Week of:

- 3/25 – Update brochure, letter (related web content), other communications
- 4/1 – Finalize communications plan and talking points for outreach
- 4/1– Talking points to Customer Service, Customer Experience, Media Relations
- 4/1 – Send targeted email to employees along first phase route for awareness
- 4/1– Letter(s) to affected property owners and residents along and around project route (brochure attached for those along route, project web page and contact info provided)
- 4/1 – Door Hangers
- 4/8 – Publish Grid article
- TBD – Work begins

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 85

Responding Witness: Lonnie E. Bellar

Q-85. Please provide a listing by type of trees and number of same removed from transmission lines in Fayette County during this five year cycle.

A-85. Transmission began transitioning to a five-year cycle in 2017. The company did not track the number of trees removed in Fayette County for transmission vegetation management for years 2017-2019. The company removed 806 trees in 2020 in Fayette County, but does not track information regarding the quantity of each species.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 86

Responding Witness: Lonnie E. Bellar

Q-86. By the categories of high voltage and low voltage transmission lines, please provide how many trees and corridor miles have been cleared and how many remain to be cleared under the current five year plan.

A-86. The company does not track the number of trees removed. See Bellar Testimony line 9, page 33 for information related to corridor miles cleared.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information
Dated January 8, 2021

Case No. 2020-00349

Question No. 87

Responding Witness: John K. Wolfe

Q-87. Please refer to the testimony of John K. Wolfe beginning at page 10:

a. Please describe the "routine clearing program" for scheduled trimming.

b. Please provide the number of customer authorizations LGE/KU required for each year for the past 10 years before tree trimming could occur.

c. How long has distribution line maintenance been on a 5-year cycle?

d. Please provide a link to the ANSI A300 standards for vegetation management.

e. Please provide a list of the number of at-risk trees removed from the distribution system in each year since 2010.

f. Please provide the following information separately for (a) Transmission lines and (b) distribution lines: which kind of trees are currently allowed to be planted in the easements and right of ways and which trees are not allowed to be planted.

A-87.

a. See the response to Question No. 83(a).

b. Authorizations are not required for routine trimming maintenance unless trimming more than the previous cycle trim. The Company does not have detailed records of each customer where discussions took place.

c. Since 2007.

d. See ANSI A300 link, Utility Pruning of Trees.
https://www.tcia.org/TCIA/Build_Your_Business/A300_Standards/Part_1.aspx

e. The table below is the number of "at-risk" hazard distribution trees that have been removed by the hazard tree program since 2010. Please note that data is not available in 2010.

Year	At-Risk Trees Removed
2010	N/A
2011	653
2012	507
2013	420
2014	753
2015	1079
2016	784
2017	1065
2018	696
2019	778
2020	986

f. (a) See attachment for vegetation allowed in transmission easements located within residential or urban areas.

(b) Distribution does not dictate between "allowed and not allowed" but provides suggestions as seen in the attachment "Right Tree Right Place".

LGE-KU Transmission Approved Tree/Shrub List

***Many Cultivars and Varieties of Most Species Exist – please check tags**

Wire Zone – Maximum 10 ft height at maturity

Weeping redbud
Weeping Mulberry
Dogwood 'Pygmaea'
Tree hydrangea
Hibiscus syriacus
Viridis Japanese maple
Dwarf Crape Myrtle
American Snowbell
Redvein Enkianthus
Fernspray Gold Shrub

Most shrubs will not grow above 10 ft. Check tag at retail/nursery to be sure

Border Zone – Maximum 20 ft height at maturity

Native Trees Max. Height 20 feet:

Redbud 'Ace of Hearts', Rising Sun'
Dogwood 'Red Beauty', 'Venus', Hyperion', 'Coud Nine'
Cornelian cherry
Crabapple (most cultivars)
Witch Hazel (all cultivars)
Canadian serviceberry/shadblow 'Glennform', 'Tarzan', Ssprizam'
Blackhaw viburnum (Viburnum prunifolium)
Arrowwood viburnum (Viburnum dentatum)

Non-Native Trees Max. Height 20 feet
Tree hydrangea
Star Magnolia (Magnolia stellata)
Viburnum spp. (Most cultivars)
Japanese snowbell
Weeping cherry (Prunus serrulata. NOT THE HIGAN)

Evergreens Max. Height 20 feet

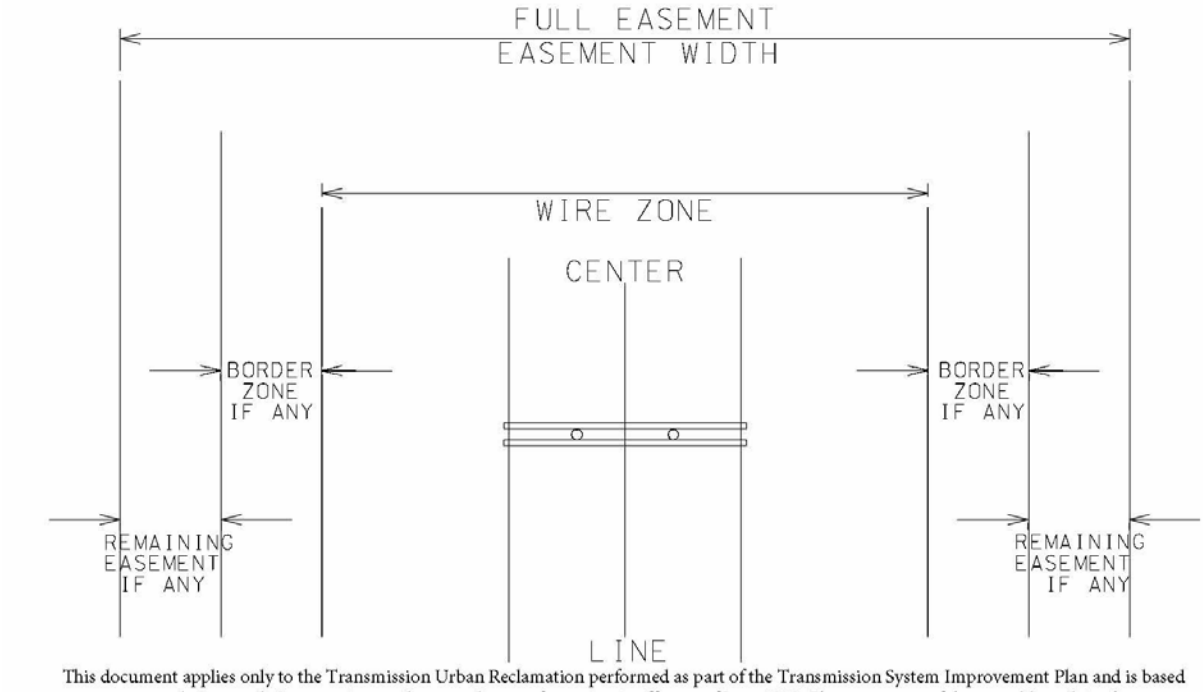
Evergreen viburnum
Eastern Arborvitae (Thuja occidentalis. NOT THE PLICATA)
False Cypress. (Chamaecyparis spp. Check the tag!)
Yew/Taxus
Deodar cedar 'Twisted Growth'

This is not necessarily a complete list. Nurseries may have other varieties of specialized species.

Remaining Easement

No current restrictions. Trees subject to trimming when needed or removal if they are dead, diseased or dying or could otherwise make contact with the line when falling.

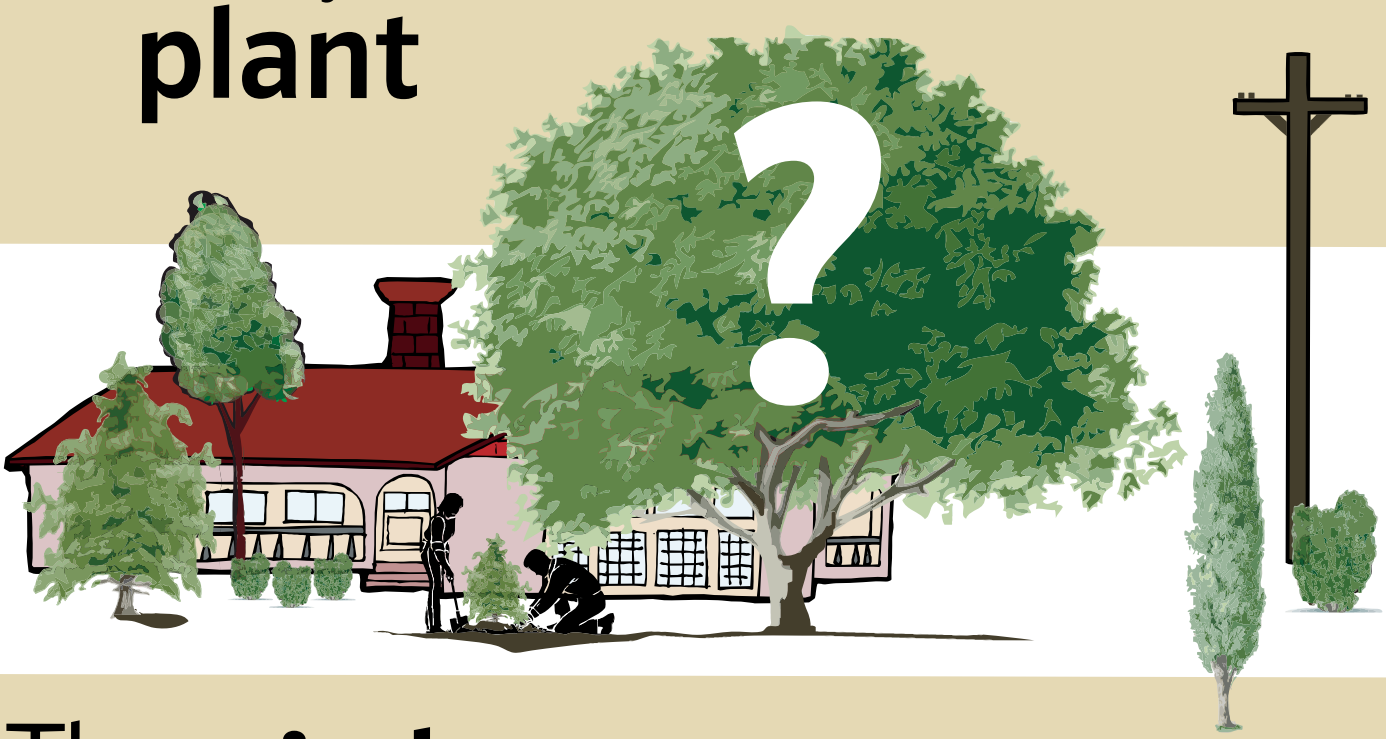
SKETCH



This document applies only to the Transmission Urban Reclamation performed as part of the Transmission System Improvement Plan and is based on current regulations, policies, practices, and current line configuration in effect as of June 2020. Changes to any of these could result in changes to the zones. LGE-KU retains all rights in and to the easement as shown in the recorded document affecting your property.

Rev 1 8-18-2020

Plan *before you* plant

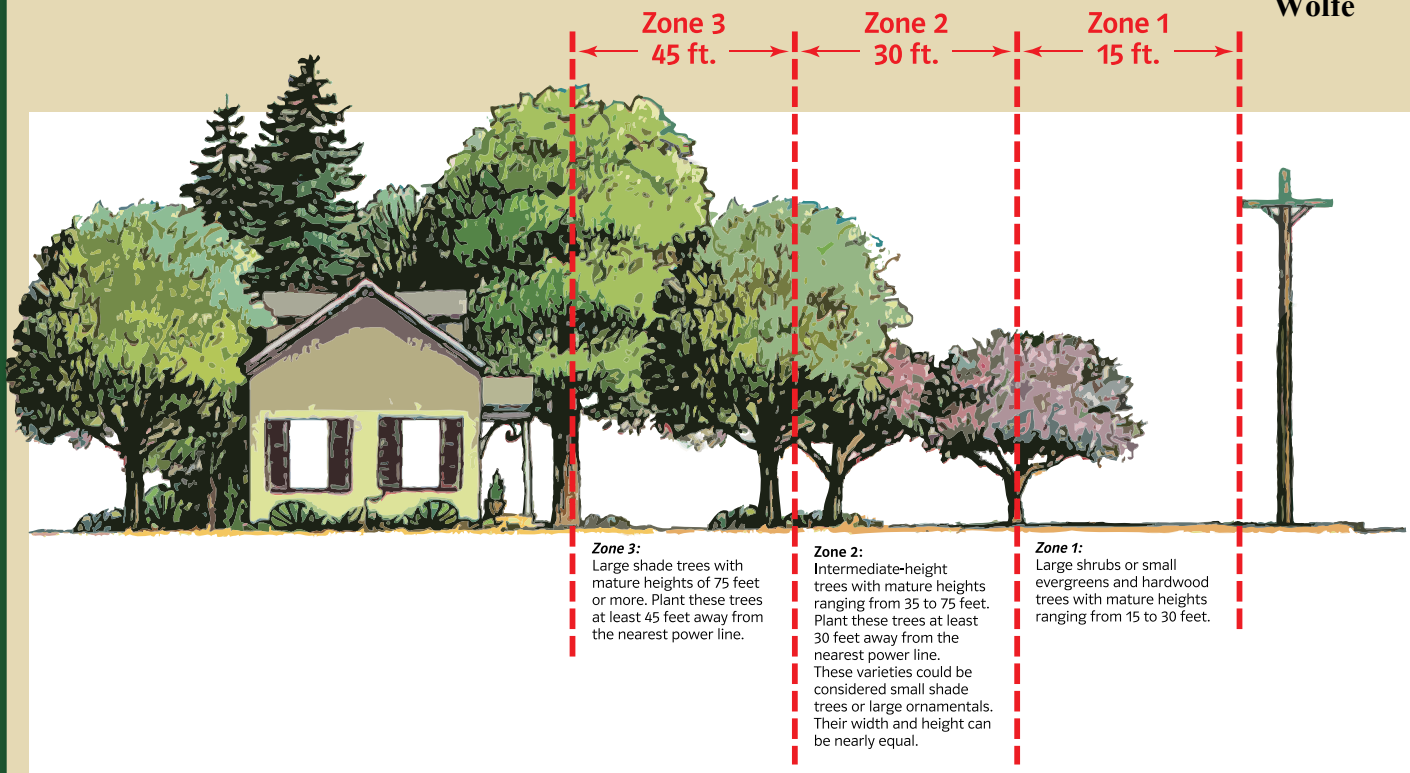


The right *tree* — the right *place*

LG&E KU OVEC

PPL companies

Consider the tree being planted...



On these pages, we have compiled a list of tree and shrub varieties and classified them — based on their height at maturity — into three zones. This information will prove valuable in helping you select the right tree for the right space.

These are only suggested varieties. There are many other good varieties available, but two important things to keep in mind when deciding on tree species are knowing the mature height and the mature width of the variety before you plant.

Zone 1: *Shrubs*

Species	Drained Soil	Moist Soil	Sun	Shade	Mature Height (ft.)	Value and Remarks
Winterberry	•	•	•		10	Red berries in winter
Viburnum Species	•		•	Semi	25	Fragrant flowers
Winter Honeysuckle	•		•	Semi	10	Good hedge; fragrant flowers
Weigela	•		•		8	Red or pink flowers
Forsythia	•	Semi	•	Semi	10	Yellow blooms
Lilacs	•		•	Semi	10	Fragrant blooms
Mock Orange	•	Semi	•	Semi	8	Choose fragrant varieties
Deutzia	•	Semi	•	Semi	8	Graceful, white pendulous flowers
Flowering Quince	•	Semi	•	Semi	6	Orange, pink or white blooms
Burning Bush	•		•	Semi	6	Red fall color
Hydrangea	•	Semi	•	Semi	8	Many varieties; summer blooms
Taxus Yew	•		•	•	20	Many shapes and forms
Calycanthus	•	Semi	•	Semi	8	Unique, fruity fragrance

Zone 1: *Small trees*

Species	Drained Soil	Moist Soil	Sun	Shade	Mature Height (ft.)	Value and Remarks
Junipers	•		•		30	Keteleeri, Canaerti, Columnaris
Arborvitae	•	•	•		20	Techny, American, Emerald
Paperbark Maple	•		•		25	Exfoliating bark
Serviceberry	•		•	Semi	30	White flowers; orange-red fall color
Redbud	•	•	•	Semi	35	Purplish flowers in spring
Fringetree	•		•	Semi	30	White blooms in spring
Dogwoods	•		Semi	Semi	40	White or pink blooms
Kousa Dogwoods	•		•	Semi	20	Good resistance
Cornelian cherry dogwood	•		•	Semi	20	Yellow flowers—early spring
Smoke tree	•		•		30	Green- and red-leafed varieties
Winter king hawthorn	•	Semi	•	Semi	35	Red berries in winter
Royal star magnolia	•	Semi	•	Semi	20	White blooms in spring
Sweetbay magnolia	•	Semi	•	Semi	30	Tulip-like blossoms in spring
Ann Magnolia	•	Semi	•	Semi	25	Pinkish-white tulip flowers in spring
Flowering Crabs	•	Semi	•		25	Choose disease-resistant
Japanese tree lilac	•		•		30	White blooms late spring
Red buckeye	•	Semi	•	Semi	25	Red blooms
Akebono flowering cherry	•		•		25	Pinkish-white flowers in spring
Carolina silverbell	•		•	•	25	White bell-like flowers in spring
American hornbeam	•	•	•	•	35	Ky. native; beech-like foliage
Paw paw	•	•	•	•	20	Tropical-like foliage, edible fruit
Witch hazel	•		•	Semi	15	Winter bloomer
Hop-hornbeam	•	Semi	•	Semi	35	Good native ornamental tree
Crepe Myrtle	•		•		15	Train into multi-trunk flowering tree

Zone 2: *Medium trees*

Species	Drained Soil	Moist Soil	Sun	Shade	Mature Height (ft.)	Value and Remarks
Katsura	•	Semi	•		75	Good yellow fall color
Yellowwood	•		•	Semi	60	Native; white, pea-like blooms
Aristocrat Pear	•	Semi	•		45	Best of the ornamental pears
Sawtooth Oak	•		•		60	Yellow fall color
Honeylocust	•	Semi	•		50	Choose patented varieties
Foster Holly	•		•	Semi	35	Avoid exposure to windy locations
Sourwood	•		•	Semi	75	Beautiful mid-summer bloomer
American Holly	•	Semi	•	Semi	45	Berries range from red to yellow

Zone 3: *Large trees*

Species	Drained Soil	Moist Soil	Sun	Shade	Mature Height (ft.)	Value and Remarks
Red maple	•	•	•		80	Choose patented varieties
Sugar maple	•		•		100	Yellow-orange fall color
River birch	•	•	•		90	Multi-trunk specimen
Ginkgo	•		•		100	Choose named varieties
Tulip poplar	•	Semi	•		150	Shiny leaves; yellow fall color
Sweetgum	•	•	•		125	Maroon-purple fall color
Blackgum	•	•	•		90	Brilliant red fall color
White oak	•		•		100	Wide-spreading; slow grower
Bald cypress	•	•	•		150	Ferny needle-like foliage
Zelkova	•		•		70	Choose patented varieties
American elm	•		•		100	New disease-resistant varieties
Pin oak	•	•	•		100	Sensitive to high pH
Willow oak	•	•	•		75	Excellent shade tree
Red oak	•		•		100	Rapid grower of the oaks
White Pine	•		•		150	Problems in heavy clay soils
Norway spruce	•		•	Semi	150	Short, dark green needles
Hemlock	•		•	Semi	150	Can withstand shearing

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 88

Responding Witness: Lonnie E. Bellar

Q-88. For each year of the current cycle, please provide the number of contractors (individuals) and the number of Company employees engaged in vegetation management in Fayette County.

A-88. Transmission began transitioning to a five-year cycle in 2017. From 2017-2020, the company has had two (2) Company employees within transmission engaged in vegetation management in Fayette County. The number of contractors (individuals) performing transmission vegetation management has varied based on the work occurring at any given time. The numbers provided below represent the maximum numbers for each year.

2017 = 8
2018 = 8
2019 = 20
2020 = 12

See table below for the Distribution contractors and employees.

Year	Number of Contractors (Individuals)	Company Employees
2016	45	2
2017	49	2
2018	32	2
2019	50	2
2020	45	2

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 89

Responding Witness: Lonnie E. Bellar

Q-89. By position and duties, please list all Company positions that supervise contractors in vegetation management.

A-89. Transmission Right-of-Way coordinators prescribe and monitor work plans along with providing oversight of the vegetation management contractors. Group Leader of Transmission Line Asset Management supervises the Transmission Right-of-Way Coordinators.

Distribution arborists prescribe and monitor work plans along with providing oversight of vegetation management contractors. Manager of Forestry Services supervises the distribution arborists.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 90

Responding Witness: Lonnie E. Bellar

Q-90. Please describe the response that the Company has made to each complaint about tree trimming and vegetation management that the Company has received from Fayette County customers and how same were resolved.

A-90. The Company does not have records documenting each complaint related to tree trimming and vegetation management for Transmission and Distribution. The Company makes every effort to follow up on each complaint received. The follow up generally includes a review of the complaint and circumstances, and often includes a site visit with the customer to understand and in many cases resolve their concerns.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 91

Responding Witness: Lonnie E. Bellar

Q-91. In the last 20 years has the Company ever recommended that certain type of trees be planted in easements or rights-of-way? If so, please state the date, type of trees and whether any documentation exists.

a. Please provide the following information separately for (i) transmission lines and (ii) distribution lines: which kind of trees are currently allowed to be planted in the easements and right of ways and which trees are not allowed to be planted.

b. Is the Company aware of or approve of contractors cutting down trees under either line without regard to whether the trees have been approved?

c. With respect to type of line (transmission or distribution) what written guidance, laws or regulations require that a particular tree be cleared as opposed to trimming same? Please attach a copy or link to each such written document. Whether such a document exists or not, please detail how the decision is made to clear not trim and who makes the decision for transmission and distribution lines.

A-91.

a. i. For transmission see the response to Question No. 87(f)
ii. For distribution see the response to Question No. 87(f)

b. No.

c. For transmission, see the response to Question No. 97.

Distribution does not follow any guidance for "clear vs trim". Arborists prepare circuits for trim and note any trees that may be good candidates for removal. During the notification process and prior to work, property owners are asked for permission to authorize the removal.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 92

Responding Witness: John K. Wolfe

Q-92. For the Reliability and Resiliency Plan attached to the testimony of John K. Wolfe, please provide the following information:

a. How much money is budgeted in this rate case for vegetation management separately for distribution and transmission? Additionally provide the same information for the years 2016-2020.

b. Please provide a copy of the "integrated management plan" in effect now and for the period covered by the Reliability and Resiliency Plan.

A-92.

a. The following chart provides the Distribution vegetation management costs budgeted in this rate case (July 01, 2021 – June 30, 2022) and the actual costs for years 2016-2020:

Distribution					
Rate Case Period	2016	2017	2018	2019	2020
18,729,241	14,924,100	13,830,246	16,320,890	17,789,585	17,090,208

The following chart provides the Transmission vegetation management costs budgeted in this rate case (July 01, 2021 – June 30, 2022) and the actual costs for years 2016-2020:

Transmission					
Rate Case Period	2016	2017	2018	2019	2020
10,666,993	5,286,815	7,985,351	10,866,183	9,729,783	7,969,097

b. See the response to Question No. 83(a).

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 93

Responding Witness: Lonnie E. Bellar

Q-93. Prior to beginning the implementation of TSIP in 2016, did the Company communicate same to any LFUCG official?

A-93. Yes, the Company presented the TSIP plan in detail as part of its 2016 Rate Case, in which LFUCG was an intervener.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 94

Responding Witness: John K. Wolfe

Q-94. Please provide copies of the RCP work plans for the prior 10 years. Which arborists prepared same plans?

A-94. See attached.

Lester	
Moore	
Canfield	

Cycle	Co	Op Center	Op Center Tree	Sub Name	Sub No	Circuit No	Volts KV	OH Miles	OH Miles 3PH	Total Customers	2nd Previous Cycle Date	Previous Cycle Date	Compld Trim Date
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0090	KV	0.00	0.00	0	10/23/2010	10/29/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0052	KV	0.00	0.00	0	10/23/2010	10/29/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0144	4.16KV	4.25	2.56	530	10/23/2010	10/29/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0009	4.16KV	5.03	1.97	898	9/17/2011	10/10/2015	7/20/2019
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0008	4.16KV	1.79	1.36	307	9/17/2011	10/10/2015	7/20/2019
2019	KU	LEXOC	LEXOCS	AMERICAN AVENUE	196	0178	12.47KV	2.53	2.33	706	10/23/2010	8/19/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	ASHLAND AVENUE	808	0050	4.16KV	4.60	2.18	978	10/23/2010	12/21/2014	11/23/2019
2019	KU	LEXOC	LEXOCS	ASHLAND AVENUE	808	0187	4.16KV	3.02	1.70	780	1/15/2011	5/9/2015	12/21/2019
2019	KU	LEXOC	LEXOCS	ASHLAND AVENUE	808	0111	2.40KV	5.19	2.15	971	1/15/2011	5/9/2015	12/21/2019
2019	KU	LEXOC	LEXOCS	ASHLAND AVENUE	808	0048	2.40KV	4.72	1.89	533	12/17/2011	12/19/2015	9/18/2020
2019	KU	LEXOC	LEXOCS	ASHLAND AVENUE	808	0049	2.40KV	2.90	1.52	814	1/19/2013	12/24/2016	9/18/2020
2019	KU	LEXOC	LEXOCS	ASHLAND PIPE	607	0142	12.47KV	6.78	3.87	1762	8/7/2010	8/30/2014	8/17/2019
2019	KU	LEXOC	LEXOCS	ASHLAND PIPE	607	0143	12.47KV	1.62	1.54	479	8/7/2010	8/30/2014	8/17/2019
2019	KU	LEXOC	LEXOCN	BELT LINE	526	0129	12.47KV	13.24	5.10	1964	12/29/2007	8/25/2012	8/12/2017
2019	KU	LEXOC	LEXOCN	BELT LINE	526	0036	7.20KV	6.60	4.66	564	9/15/2007	5/5/2012	2/6/2016
2019	KU	LEXOC	LEXOCN	BELT LINE	526	0086	12.47KV	2.34	2.09	148	9/15/2007	5/5/2012	2/6/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0150	12.47KV	4.50	3.99	1262	9/22/2007	7/21/2012	8/13/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0149	12.47KV	4.48	3.79	1150	9/22/2007	7/21/2012	8/13/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0151	12.47KV	1.64	1.53	309	9/22/2007	10/22/2012	10/22/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0873	12.47KV	7.29	4.86	1756	9/29/2007	10/22/2012	11/12/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0874	12.47KV	4.05	3.76	2362	9/29/2007	10/22/2012	10/29/2016
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0905	12.47KV	4.56	4.41	1114	0/0/00	0/0/00	2/11/2017
2019	KU	LEXOC	LEXOCN	BRYANT ROAD	549	0904	12.47KV	2.57	2.43	982	0/0/00	0/0/00	2/11/2017
2019	KU	LEXOC	LEXOCN	BUCHANAN	847	0058	4.16KV	0.03	0.03	0	8/15/2011	12/14/2013	9/30/2017
2019	KU	LEXOC	LEXOCN	BUCHANAN	847	0010	2.40KV	2.74	2.06	311	8/15/2011	12/14/2013	9/30/2017
2019	KU	LEXOC	LEXOCN	BUCHANAN	847	0005	4.16KV	4.18	2.71	671	8/15/2011	12/14/2013	9/30/2017
2019	KU	LEXOC	LEXOCS	CLAYS MILL	532	0146	7.20KV	9.48	3.12	2011	10/18/2008	3/30/2013	4/8/2017
2019	KU	LEXOC	LEXOCS	CLAYS MILL	532	0147	12.47KV	8.75	4.18	1393	12/27/2008	5/11/2013	5/27/2017
2019	KU	LEXOC	LEXOCS	CLAYS MILL	532	0148	12.47KV	7.41	2.49	1089	7/4/2009	10/5/2013	10/21/2017
2019	KU	LEXOC	LEXOCS	CLAYS MILL	532	0145	12.47KV	10.02	5.84	1651	11/14/2009	10/19/2013	2/3/2018
2019	KU	LEXOC	LEXOCN	EASTLAND	812	0182	7.20KV	16.13	7.85	2341	0/0/00	12/14/2013	6/22/2019
2019	KU	LEXOC	LEXOCN	FMC	807	0120	12.47KV	3.71	3.70	271	11/17/2007	5/19/2012	7/23/2016
2019	KU	LEXOC	LEXOCN	FMC	807	0141	12.47KV	0.11	0.11	0	11/17/2007	5/19/2012	7/23/2016
2019	KU	LEXOC	LEXOCN	FMC	807	0123	12.47KV	2.10	1.52	362	11/17/2007	5/19/2012	7/23/2016
2019	KU	LEXOC	LEXOCN	FMC	807	0122	12.47KV	1.15	1.15	33	11/17/2007	5/19/2012	7/23/2016
2019	KU	LEXOC	LEXOCN	FMC	807	0121	12.47KV	0.74	0.74	7	11/17/2007	5/19/2012	7/23/2016
2019	KU	LEXOC	LEXOCS	G E LAMP WORKS	659	0012	KV	0.00	0.00	133	6/16/2012	2/27/2016	5/9/2020
2019	KU	LEXOC	LEXOCS	G E LAMP WORKS	659	0032	KV	0.00	0.00	0	0/0/00	3/12/2016	5/9/2020
2019	KU	LEXOC	LEXOCS	G E LAMP WORKS	659	0094	2.40KV	1.79	0.97	187	9/23/2017	9/23/2017	5/9/2020
2019	KU	LEXOC	LEXOCS	GE LAMP WORKS	659	0013	4.16KV	0.02	0.02	0	0/0/00	3/12/2016	5/9/2020
2019	KU	LEXOC	LEXOCN	HAEFLING	127	0055	7.20KV	12.41	8.69	1188	11/1/2008	2/16/2013	4/20/2016
2019	KU	LEXOC	LEXOCN	HAEFLING	127	0060	12.47KV	6.65	5.95	332	10/4/2008	9/22/2012	9/10/2016
2019	KU	LEXOC	LEXOCN	HAEFLING	127	0089	12.47KV	0.58	0.58	3	0/0/00	9/22/2012	9/10/2016
2019	KU	LEXOC	LEXOCN	HAEFLING	127	0059	12.47KV	1.50	1.36	11	0/0/00	9/22/2012	9/10/2016
2019	KU	LEXOC	LEXOCN	HALEY	667	0045	7.20KV	55.73	13.24	1037	2/4/2012	8/29/2015	1/16/2020
2019	KU	LEXOC	LEXOCN	HALEY	667	0046	7.20KV	36.52	9.00	377	11/3/2007	2/25/2012	11/7/2015
2019	KU	LEXOC	LEXOCS	HIGBY MILL DISTRIBUTION	716	1071	7.20KV	9.53	4.29	1701	6/27/2009	12/21/2013	6/16/2018
2019	KU	LEXOC	LEXOCS	HIGBY MILL DISTRIBUTION	716	0023	12.47KV	41.93	18.40	1709	12/25/2010	12/27/2014	1/19/2019
2019	KU	LEXOC	LEXOCS	HIGBY MILL DISTRIBUTION	716	0070	12.47KV	0.68	0.51	1336	6/27/2009	12/21/2013	6/16/2018
2019	KU	LEXOC	LEXOCS	HIGBY MILL DISTRIBUTION	716	0128	12.47KV	1.27	1.22	533	6/27/2009	12/21/2013	6/16/2018
2019	KU	LEXOC	LEXOCS	HIGH BRIDGE	762	0590	2.40KV	7.29	2.12	137	4/26/2008	10/13/2012	7/23/2016
2019	KU	LEXOC	LEXOCN	HUGHES LANE	660	0037	7.20KV	89.93	14.73	1080	10/8/2011	4/10/2015	1/25/2020
2019	KU	LEXOC	LEXOCN	HUGHES LANE	660	0063	7.20KV	16.36	2.09	238	3/5/2011	4/10/2015	2/1/2020
2019	KU	LEXOC	LEXOCN	HUME ROAD	459	0191	7.20KV	9.70	2.70	87	0/0/00	0/0/00	8/30/2014
2019	KU	LEXOC	LEXOCN	HUME ROAD	459	0192	12.47KV	1.77	1.56	496	0/0/00	0/0/00	8/30/2014
2019	KU	LEXOC	LEXOCN	HUME ROAD	459	0194	12.47KV	3.14	2.83	282	0/0/00	0/0/00	8/30/2014
2019	KU	LEXOC	LEXOCN	HUME ROAD	459	0193	12.47KV	5.16	4.85	1261	0/0/00	0/0/00	10/25/2014
2019	KU	LEXOC	LEXOCN	IBM	617	0103	12.47KV	6.94	5.15	1081	4/4/2009	4/27/2013	3/24/2018
2019	KU	LEXOC	LEXOCN	IBM	617	0140	12.47KV	14.98	8.96	905	7/1//2009	5/18/2013	12/30/2017
2019	KU	LEXOC	LEXOCN	IBM	617	0057	12.47KV	0.50	0.50	7	4/4/2009	6/8/2013	3/24/2018
2019	KU	LEXOC	LEXOCN	IBM	617	0110	7.20KV	19.05	10.80	2066	3/28/2009	6/1/2013	12/23/2017
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	0596	7.20KV	10.71	5.86	711	11/19/2011	9/15/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	0594	12.47KV	4.76	3.95	1750	11/19/2011	8/29/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	0591	12.47KV	4.17	3.80	96	11/19/2011	8/29/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	0595	12.47KV	8.82	7.42	485	11/19/2011	9/15/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	0592	12.47KV	7.08	5.14	931	11/19/2011	9/15/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	INNOVATION DRIVE	428	593	12.47kv	0.00	0.00	0	11/19/2011	9/19/2015	11/9/2019
2019	KU	LEXOC	LEXOCN	JOYLAND	717	0099	7.20KV	12.23	8.09	2023	4/14/2012	1/9/2016	6/20/2020
2019	KU	LEXOC	LEXOCN	JOYLAND	717	0599	7.20KV	13.30	5.18	1158	2/24/2010	2/8/2014	11/23/2019
2019	KU	LEXOC	LEXOCN	JOYLAND	717	0025	12.47KV	21.03	6.51	1696	4/24/2010	5/3/2014	6/6/2020
2019	KU	LEXOC	LEXOCN	JOYLAND	717	0071	12.47KV	13.43	3.90	853	7/10/2010	1/31/2015	9/26/2020
2019	KU	LEXOC	LEXOCN	JOYLAND	717	0047	12.47KV	11.57	3.08	233	9/4/2010	8/23/2014	9/28/2019
2019	KU	LEXOC	LEXOCS	KENTUCKY RIVER	710	0124	4.16KV	0.02	0.02	1	6/20/2009	12/21/2013	2/10/2018
2019	KU	LEXOC	LEXOCS	KENTUCKY RIVER	710	0043	7.20KV	36.41	5.18	400	6/20/2009	12/21/2013	2/10/2018
2019	KU	MIDOC	MIDOC	KUHLMAN	547	0850	12.47KV	0.01	0.01	1	0/0/00	1/10/2010	1/10/2010
2019	KU	LEXOC	LEXOCS	KUNKEL	745	0019	4.16KV	1.62	0.83	176	11/5/2011	12/2/2015	3/28/2020
2019	KU	LEXOC	LEXOCS	KUNKEL	745	0026	4.16KV	4.20	2.37	572	11/5/2011	12/2/2015	3/28/2020
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0195	7.20KV	3.49	2.63	899	3/27/2010	6/6/2014	1/19/2019
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0152	12.47KV	1.26	1.25	8	12/9/2009	3/8/2014	9/1/2018
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0134	7.20KV	2.95	2.66	1058	12/19/2009	12/7/2013	3/3/2018
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0133	12.47KV	3.79	2.93	962	12/19/2009	12/7/2013	3/3/2018
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0135	12.47KV	11.12	6.54	2249	12/9/2009	3/29/2014	9/1/2018
2019	KU	LEXOC	LEXOCS	LAKESHORE	853	0132	7.20KV	40.50	13.70	1039	3/27/2010	6/6/2014	1/19/2019
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0118	12.47KV	4.79	1.47	443	10/1/2011	9/5/2015	6/27/2020
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0126	7.20KV	16.46	7.83	2504	3/22/2008	7/28/2012	4/9/2016
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0106	12.47KV	18.98	7.25	2096	1/26/2008	9/22/2012	6/11/2016
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0033	12.47KV	13.81	6.44	2508	0/0/00	1/5/2013	12/24/2016
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0038	12.47KV	4.56	3.43	1603	6/14/2008	12/8/2012	12/3/2016
2019	KU	LEXOC	LEXOCS	LANSDOWNE	060	0024	7.20KV	13.66	8.16	2513	7/16/2011	5/9/2015	6/15/2019
2019	KU	LEXOC	LEXOCN	LEXINGTON PLANT	028	0004	4.16KV	3.82	1.54	624	10/24/2009	3/15/2014	5/5/2018
2019	KU	LEXOC	LEXOCN	LEXINGTON PLANT	028	0007	2.40KV	6.37	2.92	1191	10/24/2009	9/30/2014	5/5/2018
2019	KU	LEXOC	LEXOCN	LEXINGTON PLANT	028	0006	2.40KV	2.21	1.66	358	10/24/2009	9/30/2014	5/5/2018
2019	KU	LEXOC	LEXOCN	LEXINGTON PLANT	028	0001	4.16KV	2.81	1.59	528	10/3/2009	10/12/2013	10/21/2017
2019	KU	LEXOC	LEXOCN	LEXINGTON PLANT	028	0003	4.16KV	3.08	1.88	522	10/3/2009	10/12/2013	10/21/2017
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0130	7.20KV	13.02	8.80	3191	9/24/2011	10/10/2015	8/22/2020
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0016	2.40KV	3.31	2.27	698	10/22/2011	11/7/2015	9/12/2020
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0039	12.47KV	10.03	7.45	2041	12/3/2011	12/12/2015	1/4/2020
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0011	2.40KV	3.00	1.78	154	12/19/2009	12/28/2013	12/2/2017
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0109	12.47KV	6.90	4.01	998	5/22/2010	7/4/2014	3/16/2019
2019	KU	LEXOC	LEXOCS	LEXINGTON WATER COMPANY	662	0085	12.47KV	0.52	0.52	1	5/22/2010	7/4/2014	3/16/2019
2019	KU	LEXOC	LEXOCN	LIBERTY ROAD	529	0092	12.47KV	6.98	6.40	786	12/31/2010	10/18/2014	7/20/2019
2019	KU	LEXOC	LEXOCN	LIBERTY ROAD	529	0095	12.47KV	5.22	3.98	1684	8/9/2008	3/2/2013	9/23/2017
2019	KU	LEXOC	LEXOCN	LIBERTY ROAD	529	0091	12.47KV	11.50	4.39	1726	8/9/2008	10/18/2014	9/30/2017
2019	KU	LEXOC	LEXOCN	LIBERTY ROAD	529	0042	12.47KV	7.64	5.06	1798	8/29/2009	9/21/2013	8/10/2019
2019	KU	LEXOC	LEXOCN	LOUDON AVENUE	176	0075	12.47KV	0.49	0.49	11	6/20/2009	12/28/2013	6/16/2018
2019	KU	LEXOC	LEXOCN	LOUDON AVENUE	176	0076	12.47KV	5.56	4.15	523	6/20/2009	12/28/2013	6/16/2018
2019	KU	LEXOC	LEXOCN	LOUDON AVENUE	176	0127	7.20KV	18.88	8.16	2563	1/2/2010	7/27/2013	1/26/2019
2019	KU	LEXOC	LEXOCS	MOUNT TABOR	769	0027	4.16KV	2.26	1.50	191	8/14/2010	7/19/2014	3/23/2019
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0083	12.47KV	17.11	7.29	255	3/31/2012	3/26/2016	10/10/2020
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0064	12.47KV	3.14	3.11	1351	10/4/2008	12/8/2012	12/1/2016
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0074	12.47KV	10.07	5.69	1344	9/15/2009	11/16/2013	11/25/2017
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0051	12.47KV	10.78	4.56	1144	12/19/2009	6/7/2014	6/9/2018
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0939	12.47KV	26.98	13.39	1114	12/19/2009	12/21/2013	7/14/2018
2019	KU	LEXOC	LEXOCS	PARKERS MILL	846	0100	12.47KV	11.57	5.89	1656	1/9/2010	4/12/2014	7/21/2018
2019	KU	LEXOC	LEXOCS	PICADOME	863	0158	12.47KV	5.11	3.44	922	7/9/2011	5/7/2015	12/28/2019
2019	KU	LEXOC	LEXOCS	PICADOME	863	0061	12.47KV	0.44	0.44	12	7/9/2011	5/7/2015	12/28/2019
2019	KU	LEXOC	LEXOCS	PICADOME	863	0080	12.47KV	8.18	4.86	989	7/9/2011	5/7/2015	12/28/2019
2019	KU	LEXOC	LEXOCS	PICADOME	863	0112	12.47KV	10.46	3.96	1565	12/25/2010	6/12/2015	4/11/2020
2019	KU	LEXOC	LEXOCS	PICADOME	863	0062	12.47KV	1.70	1.21	292	12/25/2010	6/12/2015	4/11/2020
2019	KU	LEXOC	LEXOCS	PICADOME	863	0232	12.47KV	9.13	5.44	1029	0/0/00	1/31/2015	10/5/2019
2019	KU	LEXOC	LEXOCN	PROCTOR & GAMBLE	875	0068	2.40KV	3.26	2.11	386	4/24/2010	8/23/2014	10/19/2019

2019	KU	LEXOC	LEXOCN	PROCTOR & GAMBLE	875	0066	4.16KV	0.45	0.45	6	4/24/2010	8/23/2014	10/19/2019
2019	KU	LEXOC	LEXOCN	PROCTOR & GAMBLE	875	0065	4.16KV	0.05	0.05	3	4/24/2010	8/23/2014	10/19/2019
2019	KU	LEXOC	LEXOCN	PROCTOR & GAMBLE	875	0084	4.16KV	2.29	1.79	245	4/24/2010	8/23/2014	10/19/2019
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0863	12.47KV	0.01	0.01	99	0/0/00	3/8/2014	12/8/2018
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0030	2.40KV	4.80	2.26	782	1/3/2009	6/15/2013	12/8/2018
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0015	2.40KV	2.68	1.66	503	1/3/2009	6/15/2013	12/8/2018
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0067	4.16KV	1.58	1.36	431	1/3/2009	3/1/2014	12/8/2018
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0031	4.16KV	2.55	1.56	452	1/3/2009	3/1/2014	12/8/2018
2019	KU	LEXOC	LEXOCN	RACE STREET	664	0014	2.40KV	3.93	1.69	910	1/3/2009	3/8/2014	12/8/2018
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0056	12.47KV	6.30	4.29	1554	6/25/2011	7/4/2015	6/6/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0188	12.47KV	5.11	4.31	733	12/10/2011	10/24/2015	5/9/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0069	7.20KV	9.13	4.94	1013	12/10/2011	10/24/2015	5/9/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0053	12.47KV	1.71	1.67	103	12/10/2011	10/24/2015	5/9/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0102	12.47KV	1.60	1.60	123	6/2/2012	4/9/2016	10/24/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0101	7.20KV	9.04	5.68	1980	6/2/2012	4/9/2016	10/24/2020
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0040	7.20KV	7.27	3.04	451	4/18/2009	11/16/2013	10/14/2017
2019	KU	LEXOC	LEXOCS	REYNOLDS	463	0044	12.47KV	12.86	7.17	1626	4/18/2009	11/16/2013	10/14/2017
2019	KU	LEXOC	LEXOCS	SCOTT STREET	735	0018	2.40KV	2.51	1.62	737	11/20/2010	12/20/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	SCOTT STREET	735	35	4.16KV	0.74	0.00	0	11/20/2010	12/20/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	SCOTT STREET	735	34	4.16KV	1.63	0.00	0	11/20/2010	12/20/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	SCOTT STREET	735	0017	4.16KV	2.76	2.33	994	11/20/2010	12/20/2014	7/20/2019
2019	KU	LEXOC	LEXOCS	SHUN PIKE	449	0580	7.20KV	24.92	7.94	1303	9/15/2012	9/24/2016	11/7/2020
2019	KU	LEXOC	LEXOCS	SHUN PIKE	449	0581	12.47KV	21.48	5.35	640	9/15/2012	6/24/2017	12/31/2020
2019	KU	LEXOC	LEXOCN	SPINDLETOP	823	0093	12.47KV	0.09	0.09	4	1/10/2009	3/9/2013	2/24/2018
2019	KU	LEXOC	LEXOCN	SPINDLETOP	823	0082	12.47KV	5.43	1.16	106	1/10/2009	3/9/2013	2/24/2018
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0198	12.47KV	7.90	3.59	0	0/0/00	0/0/00	0/0/00
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0199	12.47KV	5.58	4.75	0	0/0/00	0/0/00	0/0/00
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0096	7.20KV	12.17	3.68	2182	3/2/2013	8/1/2015	2/16/2017
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0108	12.47KV	2.15	1.51	345	12/6/2008	2/23/2013	2/25/2017
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0098	12.47KV	4.04	2.18	1127	1/10/2009	5/11/2013	8/31/2017
2019	KU	LEXOC	LEXOCS	STONEWALL	509	0097	12.47KV	11.25	5.84	1842	6/20/2009	10/12/2013	9/30/2017
2019	KU	LEXOC	LEXOCS	TRAFTON AVENUE	898	0404	12.47KV	3.72	3.22	89	2/25/2012	12/12/2015	2/1/2020
2019	KU	LEXOC	LEXOCS	TRAFTON AVENUE	898	0079	7.20KV	4.82	3.34	1187	2/25/2012	12/12/2015	2/1/2020
2019	KU	LEXOC	LEXOCS	TRAFTON AVENUE	898	0077	4.16KV	5.59	4.19	886	5/5/2012	3/12/2016	1/11/2020
2019	KU	LEXOC	LEXOCS	TRAFTON AVENUE	898	0078	2.40KV	2.74	1.36	502	5/5/2012	3/12/2016	1/11/2020
2019	KU	LEXOC	LEXOCS	TRAFTON AVENUE	898	0088	7.20KV	9.03	4.57	1663	4/6/2013	5/13/2017	6/13/2020
2019	KU	LEXOC	LEXOCS	TRIM MASTERS	987	9877	12.47KV	0.39	0.39	1	4/5/2008	9/15/2012	7/16/2016
2019	KU	LEXOC	LEXOCN	VILEY ROAD	621	0116	12.47KV	16.06	8.88	798	12/20/2008	3/28/2013	7/15/2017
2019	KU	LEXOC	LEXOCN	VILEY ROAD	621	0041	7.20KV	39.50	11.51	1057	3/8/2008	1/5/2013	5/28/2016
2019	KU	LEXOC	LEXOCN	VILEY ROAD	621	0115	12.47KV	0.94	0.94	25	3/15/2008	12/1/2012	7/9/2016
2019	KU	LEXOC	LEXOCN	VILEY ROAD	621	0159	12.47KV	4.19	3.48	2011	3/15/2008	10/27/2012	7/9/2016
2019	KU	LEXOC	LEXOCS	VINE STREET	739	0021	4.16KV	1.61	0.91	678	10/30/2010	10/18/2014	5/11/2019
2019	KU	LEXOC	LEXOCS	VINE STREET	739	0125	12.47KV	0.99	0.71	331	10/30/2010	10/18/2014	5/11/2019
2019	KU	LEXOC	LEXOCS	VINE STREET	739	0022	4.16KV	0.48	0.48	75	10/30/2010	10/18/2014	5/11/2019
2019	KU	LEXOC	LEXOCS	WEST CLIFF	122	3427	34.50KV	3.99	3.99	0	0/0/00	0/0/00	8/17/2013
2019	KU	LEXOC	LEXOCS	WEST HICKMAN	507	0865	12.47KV	5.74	3.91	1279	12/1/2012	6/18/2014	2/16/2019
2019	KU	LEXOC	LEXOCS	WEST HICKMAN	507	0020	12.47KV	0.06	0.06	0	12/1/2012	6/18/2014	2/16/2019
2019	KU	LEXOC	LEXOCS	WEST HICKMAN	507	0864	12.47KV	7.72	5.75	2101	8/28/2010	9/27/2014	8/3/2019
2019	KU	LEXOC	LEXOCS	WEST HIGH STREET	516	0054	12.47KV	2.24	1.56	747	11/14/2009	10/18/2014	5/11/2019
2019	KU	LEXOC	LEXOCS	WILMORE	677	0586	7.20KV	40.95	8.06	1267	7/5/2008	10/20/2012	8/20/2016
2019	KU	LEXOC	LEXOCS	WILMORE	677	0585	7.20KV	19.05	8.99	833	12/15/2012	11/12/2016	1/16/2020
2019	KU	LEXOC	LEXOCS	WILMORE	677	0587	2.40KV	0.97	0.64	3	12/15/2012	11/12/2016	1/16/2020
2019	KU	LEXOC	LEXOCS	WILMORE	677	0588	4.16KV	0.94	0.71	48	12/15/2012	11/12/2016	1/16/2020
2019	KU	LEXOC	LEXOCS	WILSON DOWNING	899	0137	12.47KV	2.76	2.73	1489	11/15/2008	2/16/2013	2/18/2017
2019	KU	LEXOC	LEXOCS	WILSON DOWNING	899	0073	12.47KV	11.91	5.86	3071	1/16/2010	2/22/2014	7/28/2018
2019	KU	LEXOC	LEXOCS	WILSON DOWNING	899	0081	7.20KV	13.27	6.19	2214	2/6/2010	5/17/2014	10/20/2018
2019	KU	LEXOC	LEXOCS	WILSON DOWNING	899	0072	7.20KV	5.96	3.16	1444	4/3/2010	6/6/2014	2/16/2019
2019	KU	LEXOC	LEXOCS	WILSON DOWNING	899	0114	12.47KV	6.14	3.41	1481	5/29/2010	7/4/2014	4/6/2019

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 95

Responding Witness: Lonnie E. Bellar

Q-95. Which arborists visually inspected the circuits in Fayette County in the last 5 years prior to clear cutting trees? Please state the date of the inspection, the arborists performing the inspection, and the circuits examined.

A-95. See attached for transmission inspection records. The Company does not have records of the person performing each inspection.

Distribution does not clear cut except in situations that have been pre-approved by the landowner / city. The following arborists were responsible for inspections in Fayette County:

- Billy Moore-Arborist (retired May 2017). Succeeded by Clinton Lester-Arborist.

- Mike Canfield-Arborist (retired December 2020). Succeeded by Dustin Bruner-Arborist.

LineCode	LineName	SectionName	PatrolDate
003804A0300	ADAMS - HAEFLING		4/29/2016 20:12
003804A0300	ADAMS - HAEFLING		8/2/2016 20:18
003804A0300	ADAMS - HAEFLING		3/23/2017 15:37
003804A0300	ADAMS - HAEFLING		6/8/2017 13:11
003804A0300	ADAMS - HAEFLING		10/13/2017 16:29
003804A0300	ADAMS - HAEFLING		11/29/2017 19:09
003804A0300	ADAMS - HAEFLING		3/16/2018 15:54
003804A0300	ADAMS - HAEFLING		6/8/2018 16:24
003804A0300	ADAMS - HAEFLING		9/14/2018 8:23
003804A0300	ADAMS - HAEFLING		4/9/2019 16:38
003804A0300	ADAMS - HAEFLING		7/2/2019 8:43
003804A0300	ADAMS - HAEFLING		10/4/2019 16:06
003804A0300	ADAMS - HAEFLING		6/4/2020 15:07
003804A0300	ADAMS - HAEFLING		10/26/2020 16:04
011012A0300	HAEFLING - INNOVATION DRIVE		4/29/2016 20:13
011012A0300	HAEFLING - INNOVATION DRIVE		8/2/2016 20:19
011012A0300	HAEFLING - INNOVATION DRIVE		3/23/2017 15:37
011012A0300	HAEFLING - INNOVATION DRIVE		6/8/2017 16:00
011012A0300	HAEFLING - INNOVATION DRIVE		10/13/2017 16:28
011012A0300	HAEFLING - INNOVATION DRIVE		11/29/2017 19:09
011012A0300	HAEFLING - INNOVATION DRIVE		3/16/2018 15:54
011012A0300	HAEFLING - INNOVATION DRIVE		6/8/2018 16:24
011012A0300	HAEFLING - INNOVATION DRIVE		9/14/2018 15:22
011012A0300	HAEFLING - INNOVATION DRIVE		4/9/2019 16:38
011012A0300	HAEFLING - INNOVATION DRIVE		7/2/2019 15:51
011012A0300	HAEFLING - INNOVATION DRIVE		10/4/2019 16:06

011012A0300	HAEFLING - INNOVATION DRIVE		6/4/2020 15:07
011012A0300	HAEFLING - INNOVATION DRIVE		10/26/2020 16:04
015603A0300	GHENT - WEST LEXINGTON		6/13/2016 14:34
015603A0300	GHENT - WEST LEXINGTON		9/12/2016 14:20
015603A0300	GHENT - WEST LEXINGTON		10/31/2016 13:44
015603A0300	GHENT - WEST LEXINGTON		6/30/2017 15:21
015603A0300	GHENT - WEST LEXINGTON		11/10/2017 17:41
015603A0300	GHENT - WEST LEXINGTON		5/21/2018 8:27
015603A0300	GHENT - WEST LEXINGTON		9/20/2018 15:53
015603A0300	GHENT - WEST LEXINGTON		3/20/2019 15:51
015603A0300	GHENT - WEST LEXINGTON		6/3/2019 0:00
015603A0300	GHENT - WEST LEXINGTON		9/27/2019 15:47
015603A0300	GHENT - WEST LEXINGTON		10/15/2020 8:20
003504A0300	HIGBY MILL - DIX		6/10/2016 0:00
003504A0300	HIGBY MILL - DIX		9/2/2016 8:47
003504A0300	HIGBY MILL - DIX		10/28/2016 15:12
003504A0300	HIGBY MILL - DIX		3/24/2017 8:51
003504A0300	HIGBY MILL - DIX		6/20/2017 8:55
003504A0300	HIGBY MILL - DIX		10/2/2017 16:00
003504A0300	HIGBY MILL - DIX		4/12/2018 9:06
003504A0300	HIGBY MILL - DIX		6/14/2018 9:21
003504A0300	HIGBY MILL - DIX		9/18/2018 8:53
003504A0300	HIGBY MILL - DIX		9/18/2018 8:58
003504A0300	HIGBY MILL - DIX		3/19/2019 7:22
003504A0300	HIGBY MILL - DIX		4/17/2019 8:52
003504A0300	HIGBY MILL - DIX		7/11/2019 9:40
003504A0300	HIGBY MILL - DIX		9/23/2019 16:48
003504A0300	HIGBY MILL - DIX		4/29/2020 9:07
003504A0300	HIGBY MILL - DIX		4/29/2020 9:47
003504A0300	HIGBY MILL - DIX		7/16/2020 14:46
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	3/23/2016 21:01

015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	4/14/2016 18:55
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	6/27/2016 0:00
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	9/13/2016 15:49
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	3/20/2017 16:10
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	5/31/2017 13:09
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	8/23/2017 15:34
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	11/30/2017 13:03
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	5/14/2018 9:32
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	7/25/2018 8:39
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	3/12/2019 10:32
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	7/3/2019 12:13
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	10/3/2019 0:00
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	5/22/2020 15:04
015604AB300	BROWN NORTH - HIGBY MILL	(Tower #84 - Higby Mill Section)	9/4/2020 13:33
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		3/23/2016 15:04
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		6/27/2016 0:00
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		9/13/2016 9:54
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		3/20/2017 16:40
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		5/31/2017 9:50
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		8/23/2017 9:18
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		11/30/2017 13:03
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		5/10/2018 9:19
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		7/25/2018 8:39
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		3/12/2019 16:20
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		10/3/2019 0:00
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		5/22/2020 15:16
013801A0300	BROWN NORTH - HIGBY MILL(DBL. CIRC.)		9/4/2020 13:15
015604B0300	CLAYS MILL TAP		3/23/2016 21:00
015604B0300	CLAYS MILL TAP		4/14/2016 18:55
015604B0300	CLAYS MILL TAP		6/27/2016 0:00
015604B0300	CLAYS MILL TAP		9/13/2016 15:50
015604B0300	CLAYS MILL TAP		3/20/2017 16:41
015604B0300	CLAYS MILL TAP		5/31/2017 18:59
015604B0300	CLAYS MILL TAP		8/23/2017 15:34

015604B0300	CLAYS MILL TAP		5/14/2018 18:04
015604B0300	CLAYS MILL TAP		7/25/2018 13:49
015604B0300	CLAYS MILL TAP		3/12/2019 10:32
015604B0300	CLAYS MILL TAP		7/3/2019 12:13
015604B0300	CLAYS MILL TAP		10/3/2019 0:00
015604B0300	CLAYS MILL TAP		5/22/2020 15:04
015604B0300	CLAYS MILL TAP		9/4/2020 13:33
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	3/23/2016 21:01
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	4/14/2016 18:55
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	6/27/2016 0:00
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	9/13/2016 15:50
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	3/20/2017 16:41
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	5/31/2017 18:59
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	8/23/2017 15:32
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	5/14/2018 18:04
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	7/25/2018 8:39
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	3/12/2019 10:30
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	7/3/2019 12:13
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	10/3/2019 0:00
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	5/22/2020 9:46
015608AA300	HIGBY MILL - WEST LEXINGTON	(Higby Mill - Tower #84 section)	9/4/2020 13:33
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		3/23/2016 20:58
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		4/14/2016 18:55

013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		6/27/2016 0:00
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		9/13/2016 15:50
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		3/20/2017 16:40
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		5/31/2017 18:59
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		8/23/2017 15:35
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		5/14/2018 18:04
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		7/25/2018 13:49
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		3/12/2019 16:20
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		7/3/2019 12:13
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		10/3/2019 0:00
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		5/22/2020 15:04
013805A0300	HIGBY MILL (66) - HIGBY MILL (716-1)		9/4/2020 13:32
004201A0300	TYRONE - HIGBY MILL		3/23/2016 13:18
004201A0300	TYRONE - HIGBY MILL		6/27/2016 0:00
004201A0300	TYRONE - HIGBY MILL		9/13/2016 0:00
004201A0300	TYRONE - HIGBY MILL		3/20/2017 16:40
004201A0300	TYRONE - HIGBY MILL		5/31/2017 13:09
004201A0300	TYRONE - HIGBY MILL		8/23/2017 13:09
004201A0300	TYRONE - HIGBY MILL		11/30/2017 13:03
004201A0300	TYRONE - HIGBY MILL		5/14/2018 9:32
004201A0300	TYRONE - HIGBY MILL		7/25/2018 13:49
004201A0300	TYRONE - HIGBY MILL		7/3/2019 10:12
004201A0300	TYRONE - HIGBY MILL		7/3/2019 10:12
004201A0300	TYRONE - HIGBY MILL		10/3/2019 0:00

004201A0300	TYRONE - HIGBY MILL		5/22/2020 0:00
004201A0300	TYRONE - HIGBY MILL		5/22/2020 9:46
004201A0300	TYRONE - HIGBY MILL		5/22/2020 9:46
004201A0300	TYRONE - HIGBY MILL		5/22/2020 9:46
004201A0300	TYRONE - HIGBY MILL		9/4/2020 8:16
006103D0300	ASHLAND TAP		6/2/2016 17:14
006103D0300	ASHLAND TAP		6/10/2016 17:25
006103D0300	ASHLAND TAP		8/22/2016 17:01
006103D0300	ASHLAND TAP		11/18/2016 15:49
006103D0300	ASHLAND TAP		5/15/2017 15:12
006103D0300	ASHLAND TAP		8/23/2017 15:07
006103D0300	ASHLAND TAP		3/5/2018 16:41
006103D0300	ASHLAND TAP		5/24/2018 8:43
006103D0300	ASHLAND TAP		4/11/2019 15:13
006103D0300	ASHLAND TAP		7/12/2019 13:05
006103D0300	ASHLAND TAP		9/13/2019 0:00
006103D0300	ASHLAND TAP		5/5/2020 14:05
006103D0300	ASHLAND TAP		8/3/2020 16:03
006103A0300	FAWKES - HIGBY MILL		6/2/2016 16:54
006103A0300	FAWKES - HIGBY MILL		8/22/2016 15:16
006103A0300	FAWKES - HIGBY MILL		11/18/2016 13:30
006103A0300	FAWKES - HIGBY MILL		5/15/2017 0:00
006103A0300	FAWKES - HIGBY MILL		8/23/2017 9:18
006103A0300	FAWKES - HIGBY MILL		3/5/2018 16:40
006103A0300	FAWKES - HIGBY MILL		5/24/2018 8:43
006103A0300	FAWKES - HIGBY MILL		9/12/2018 10:38
006103A0300	FAWKES - HIGBY MILL		4/11/2019 9:01
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40

006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		7/11/2019 9:40
006103A0300	FAWKES - HIGBY MILL		9/13/2019 14:43
006103A0300	FAWKES - HIGBY MILL		5/5/2020 11:16
006103A0300	FAWKES - HIGBY MILL		8/3/2020 12:37
006103B0300	WATER WORKS #1 TAP		6/2/2016 17:14
006103B0300	WATER WORKS #1 TAP		6/10/2016 17:25
006103B0300	WATER WORKS #1 TAP		8/22/2016 16:59
006103B0300	WATER WORKS #1 TAP		11/18/2016 15:50
006103B0300	WATER WORKS #1 TAP		5/15/2017 13:13
006103B0300	WATER WORKS #1 TAP		8/23/2017 9:18
006103B0300	WATER WORKS #1 TAP		3/5/2018 16:40
006103B0300	WATER WORKS #1 TAP		5/24/2018 15:23
006103B0300	WATER WORKS #1 TAP		4/11/2019 15:13
006103B0300	WATER WORKS #1 TAP		7/11/2019 9:40
006103B0300	WATER WORKS #1 TAP		9/13/2019 0:00
006103B0300	WATER WORKS #1 TAP		5/5/2020 14:05
006103B0300	WATER WORKS #1 TAP		8/3/2020 16:03
006103C0300	WATER WORKS #2 TAP		6/2/2016 17:14
006103C0300	WATER WORKS #2 TAP		6/10/2016 17:25
006103C0300	WATER WORKS #2 TAP		8/22/2016 17:01
006103C0300	WATER WORKS #2 TAP		11/18/2016 15:50
006103C0300	WATER WORKS #2 TAP		5/15/2017 13:13
006103C0300	WATER WORKS #2 TAP		8/23/2017 9:18
006103C0300	WATER WORKS #2 TAP		3/5/2018 16:41
006103C0300	WATER WORKS #2 TAP		5/24/2018 8:43
006103C0300	WATER WORKS #2 TAP		4/11/2019 15:13
006103C0300	WATER WORKS #2 TAP		7/12/2019 13:05
006103C0300	WATER WORKS #2 TAP		9/13/2019 0:00
006103C0300	WATER WORKS #2 TAP		5/5/2020 14:05
006103C0300	WATER WORKS #2 TAP		8/3/2020 16:03
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	5/31/2016 13:58

011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	8/30/2016 9:27
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	11/8/2016 9:23
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	3/28/2017 10:42
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	6/21/2017 8:14
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	10/20/2017 20:32
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	10/25/2017 8:52
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	4/27/2018 9:27
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	7/30/2018 8:29
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	2/25/2019 10:24
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	7/24/2019 17:00
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	10/23/2019 16:25
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	5/20/2020 15:05
011003AA300	AVON - LOUDON AVENUE	(Avon - I-75 Section)	10/13/2020 14:31
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	5/31/2016 13:58
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	8/30/2016 18:25
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	9/8/2016 17:43
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	11/8/2016 15:33
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	3/28/2017 16:44
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	6/21/2017 16:46
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	10/25/2017 17:08
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	4/27/2018 16:21
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	7/30/2018 8:29
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	2/27/2019 5:33
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	7/24/2019 17:00
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	10/23/2019 8:50
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	5/20/2020 15:05
003815B0300	AVON TAP	(off Loudon Ave. - Paris line)	10/13/2020 14:51
006111B0300	AVON TAP		5/31/2016 13:58
006111B0300	AVON TAP		8/30/2016 18:25

006111B0300	AVON TAP		11/8/2016 15:33
006111B0300	AVON TAP		3/28/2017 16:43
006111B0300	AVON TAP		6/21/2017 16:46
006111B0300	AVON TAP		10/20/2017 20:32
006111B0300	AVON TAP		10/25/2017 8:52
006111B0300	AVON TAP		4/27/2018 16:21
006111B0300	AVON TAP		7/30/2018 8:29
006111B0300	AVON TAP		2/27/2019 5:33
006111B0300	AVON TAP		7/24/2019 0:00
006111B0300	AVON TAP		10/23/2019 0:00
006111B0300	AVON TAP		5/20/2020 15:05
006111B0300	AVON TAP		10/13/2020 9:10
003815C0300	BRIAR HILL TAP		5/31/2016 14:17
003815C0300	BRIAR HILL TAP		8/30/2016 18:25
003815C0300	BRIAR HILL TAP		11/8/2016 15:33
003815C0300	BRIAR HILL TAP		3/28/2017 16:43
003815C0300	BRIAR HILL TAP		6/21/2017 16:46
003815C0300	BRIAR HILL TAP		10/25/2017 17:08
003815C0300	BRIAR HILL TAP		4/27/2018 16:21
003815C0300	BRIAR HILL TAP		7/30/2018 13:33
003815C0300	BRIAR HILL TAP		2/27/2019 5:33
003815C0300	BRIAR HILL TAP		7/24/2019 17:30
003815C0300	BRIAR HILL TAP		10/23/2019 16:29
003815C0300	BRIAR HILL TAP		5/20/2020 15:06
003815C0300	BRIAR HILL TAP		10/13/2020 14:51
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	5/31/2016 13:58
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	6/14/2016 0:00
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	8/30/2016 9:27
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	11/8/2016 9:23
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	3/28/2017 10:42
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	6/21/2017 8:14
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	10/25/2017 9:16
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	4/27/2018 9:27

003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	7/30/2018 8:29
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	2/25/2019 10:24
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	7/24/2019 17:00
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	5/20/2020 11:48
003815AB300	LOUDON AVENUE - PARIS SWITCHING STATION	(I-75 CROSSING - PARIS SWITCHING STATION)	10/13/2020 9:10
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	3/8/2016 13:00
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	5/18/2016 21:16
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	6/28/2016 18:14
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	7/29/2016 15:35
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	9/16/2016 16:05
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	11/17/2016 14:59
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	2/10/2017 15:44
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	5/22/2017 15:11
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	6/30/2017 15:19
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	8/1/2017 16:36
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	9/28/2017 21:02
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	11/16/2017 16:18
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	3/12/2018 17:01
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	5/25/2018 16:20
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	7/13/2018 14:53
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	8/24/2018 13:48
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	11/5/2018 16:17
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	12/12/2018 14:33
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	3/15/2019 14:04
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	5/13/2019 16:12
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	6/28/2019 15:45
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	7/26/2019 14:14
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	9/24/2019 15:57
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	11/26/2019 13:55
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	4/7/2020 13:54
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	5/21/2020 15:19
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	7/24/2020 16:02
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	9/8/2020 16:14
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	11/2/2020 13:37
015604AA300	BROWN NORTH - HIGBY MILL(D.C. w/W. LEX.)	(Brown No. - Tower #84 Section)	12/3/2020 10:46
004402A0300	BROWN NORTH - WEST LEXINGTON		3/7/2016 12:46
004402A0300	BROWN NORTH - WEST LEXINGTON		5/18/2016 11:15
004402A0300	BROWN NORTH - WEST LEXINGTON		6/28/2016 12:45
004402A0300	BROWN NORTH - WEST LEXINGTON		7/29/2016 13:30
004402A0300	BROWN NORTH - WEST LEXINGTON		9/16/2016 12:33
004402A0300	BROWN NORTH - WEST LEXINGTON		11/17/2016 12:10
004402A0300	BROWN NORTH - WEST LEXINGTON		2/10/2017 15:44

004402A0300	BROWN NORTH - WEST LEXINGTON		5/22/2017 15:10
004402A0300	BROWN NORTH - WEST LEXINGTON		6/30/2017 15:19
004402A0300	BROWN NORTH - WEST LEXINGTON		8/1/2017 13:16
004402A0300	BROWN NORTH - WEST LEXINGTON		9/28/2017 21:01
004402A0300	BROWN NORTH - WEST LEXINGTON		11/16/2017 16:17
004402A0300	BROWN NORTH - WEST LEXINGTON		3/12/2018 10:57
004402A0300	BROWN NORTH - WEST LEXINGTON		5/25/2018 9:01
004402A0300	BROWN NORTH - WEST LEXINGTON		7/13/2018 14:52
004402A0300	BROWN NORTH - WEST LEXINGTON		8/24/2018 10:55
004402A0300	BROWN NORTH - WEST LEXINGTON		11/5/2018 16:17
004402A0300	BROWN NORTH - WEST LEXINGTON		12/12/2018 14:33
004402A0300	BROWN NORTH - WEST LEXINGTON		3/15/2019 14:04
004402A0300	BROWN NORTH - WEST LEXINGTON		5/13/2019 16:12
004402A0300	BROWN NORTH - WEST LEXINGTON		6/28/2019 8:55
004402A0300	BROWN NORTH - WEST LEXINGTON		7/26/2019 8:22
004402A0300	BROWN NORTH - WEST LEXINGTON		9/24/2019 15:56
004402A0300	BROWN NORTH - WEST LEXINGTON		11/26/2019 13:55
004402A0300	BROWN NORTH - WEST LEXINGTON		4/7/2020 13:54
004402A0300	BROWN NORTH - WEST LEXINGTON		5/21/2020 15:19
004402A0300	BROWN NORTH - WEST LEXINGTON		7/24/2020 6:30
004402A0300	BROWN NORTH - WEST LEXINGTON		9/8/2020 8:27
004402A0300	BROWN NORTH - WEST LEXINGTON		11/2/2020 8:31
004402A0300	BROWN NORTH - WEST LEXINGTON		12/3/2020 10:46
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	3/8/2016 13:00
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	5/18/2016 21:16
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	6/28/2016 18:16
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	7/29/2016 15:35

015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	9/16/2016 16:05
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	11/17/2016 14:59
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	2/10/2017 15:44
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	5/22/2017 15:11
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	6/30/2017 15:19
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	8/1/2017 16:36
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	9/28/2017 21:02
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	11/16/2017 16:18
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	3/12/2018 17:01
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	5/25/2018 16:20
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	7/13/2018 14:53
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	8/24/2018 13:48
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	11/5/2018 16:17
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	12/12/2018 14:33
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	3/15/2019 14:04
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	5/13/2019 16:12
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	6/28/2019 15:45
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	7/26/2019 14:14
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	9/24/2019 15:57

015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	11/26/2019 13:55
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	4/7/2020 13:54
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	5/21/2020 15:19
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	7/24/2020 16:02
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	9/8/2020 16:14
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	11/2/2020 13:37
015608AB300	HIGBY MILL - WEST LEXINGTON	(Tower #84 - West Lexington)	12/3/2020 10:46
015602A0300	WEST LEXINGTON - BROWN NORTH		3/8/2016 13:00
015602A0300	WEST LEXINGTON - BROWN NORTH		5/18/2016 21:16
015602A0300	WEST LEXINGTON - BROWN NORTH		6/28/2016 18:14
015602A0300	WEST LEXINGTON - BROWN NORTH		7/29/2016 15:35
015602A0300	WEST LEXINGTON - BROWN NORTH		9/16/2016 16:05
015602A0300	WEST LEXINGTON - BROWN NORTH		11/17/2016 14:59
015602A0300	WEST LEXINGTON - BROWN NORTH		2/10/2017 15:44
015602A0300	WEST LEXINGTON - BROWN NORTH		5/22/2017 15:11
015602A0300	WEST LEXINGTON - BROWN NORTH		6/30/2017 15:19
015602A0300	WEST LEXINGTON - BROWN NORTH		8/1/2017 16:36
015602A0300	WEST LEXINGTON - BROWN NORTH		9/28/2017 21:02
015602A0300	WEST LEXINGTON - BROWN NORTH		11/16/2017 16:17
015602A0300	WEST LEXINGTON - BROWN NORTH		3/12/2018 17:01
015602A0300	WEST LEXINGTON - BROWN NORTH		5/25/2018 16:21
015602A0300	WEST LEXINGTON - BROWN NORTH		7/13/2018 14:52
015602A0300	WEST LEXINGTON - BROWN NORTH		8/24/2018 13:48
015602A0300	WEST LEXINGTON - BROWN NORTH		11/5/2018 16:17
015602A0300	WEST LEXINGTON - BROWN NORTH		12/12/2018 14:33

015602A0300	WEST LEXINGTON - BROWN NORTH		3/15/2019 14:04
015602A0300	WEST LEXINGTON - BROWN NORTH		5/13/2019 16:12
015602A0300	WEST LEXINGTON - BROWN NORTH		6/28/2019 15:45
015602A0300	WEST LEXINGTON - BROWN NORTH		7/26/2019 14:14
015602A0300	WEST LEXINGTON - BROWN NORTH		9/24/2019 15:57
015602A0300	WEST LEXINGTON - BROWN NORTH		11/26/2019 13:55
015602A0300	WEST LEXINGTON - BROWN NORTH		4/7/2020 13:54
015602A0300	WEST LEXINGTON - BROWN NORTH		5/21/2020 15:19
015602A0300	WEST LEXINGTON - BROWN NORTH		7/24/2020 16:02
015602A0300	WEST LEXINGTON - BROWN NORTH		9/8/2020 16:14
015602A0300	WEST LEXINGTON - BROWN NORTH		11/2/2020 13:37
015602A0300	WEST LEXINGTON - BROWN NORTH		12/3/2020 10:46
004403A0300	WEST LEXINGTON - GHENT		3/8/2016 12:54
004403A0300	WEST LEXINGTON - GHENT		5/18/2016 21:15
004403A0300	WEST LEXINGTON - GHENT		6/28/2016 9:53
004403A0300	WEST LEXINGTON - GHENT		7/29/2016 15:33
004403A0300	WEST LEXINGTON - GHENT		9/16/2016 9:32
004403A0300	WEST LEXINGTON - GHENT		11/17/2016 14:58
004403A0300	WEST LEXINGTON - GHENT		2/10/2017 15:42
004403A0300	WEST LEXINGTON - GHENT		5/22/2017 9:11
004403A0300	WEST LEXINGTON - GHENT		6/30/2017 8:57
004403A0300	WEST LEXINGTON - GHENT		8/1/2017 0:00
004403A0300	WEST LEXINGTON - GHENT		10/5/2017 8:49
004403A0300	WEST LEXINGTON - GHENT		11/16/2017 16:15
004403A0300	WEST LEXINGTON - GHENT		3/12/2018 17:01
004403A0300	WEST LEXINGTON - GHENT		5/25/2018 9:01
004403A0300	WEST LEXINGTON - GHENT		7/13/2018 9:02
004403A0300	WEST LEXINGTON - GHENT		8/24/2018 8:22
004403A0300	WEST LEXINGTON - GHENT		11/5/2018 8:34
004403A0300	WEST LEXINGTON - GHENT		12/12/2018 14:33
004403A0300	WEST LEXINGTON - GHENT		3/15/2019 14:03

004403A0300	WEST LEXINGTON - GHENT		5/13/2019 16:12
004403A0300	WEST LEXINGTON - GHENT		6/28/2019 8:55
004403A0300	WEST LEXINGTON - GHENT		7/26/2019 8:22
004403A0300	WEST LEXINGTON - GHENT		9/24/2019 15:56
004403A0300	WEST LEXINGTON - GHENT		11/26/2019 13:54
004403A0300	WEST LEXINGTON - GHENT		4/7/2020 9:17
004403A0300	WEST LEXINGTON - GHENT		5/21/2020 8:27
004403A0300	WEST LEXINGTON - GHENT		7/24/2020 6:30
004403A0300	WEST LEXINGTON - GHENT		9/8/2020 8:27
004403A0300	WEST LEXINGTON - GHENT		11/2/2020 13:36
004403A0300	WEST LEXINGTON - GHENT		12/3/2020 10:46
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	3/23/2016 16:35
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	9/15/2016 0:00
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	9/15/2016 0:00
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	9/15/2016 0:00
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	9/14/2017 0:00
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	12/14/2017 15:38
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	5/15/2018 12:59
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	5/18/2018 14:45
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	8/20/2018 15:07
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	8/30/2018 13:04
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	3/8/2019 0:00
003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	8/23/2019 14:16

003804AA300	ADAMS - HAEFLING	ADAMS - HOOVER SECTION	4/27/2020 13:53
003807A0300	AMERICAN AVENUE - HAEFLING		3/30/2016 18:25
013803A0300	AMERICAN AVENUE - HAEFLING		3/30/2016 18:27
003807A0300	AMERICAN AVENUE - HAEFLING		9/15/2016 0:00
003807A0300	AMERICAN AVENUE - HAEFLING		9/15/2016 0:00
013803A0300	AMERICAN AVENUE - HAEFLING		9/20/2016 0:00
013803A0300	AMERICAN AVENUE - HAEFLING		9/20/2016 0:00
013803A0300	AMERICAN AVENUE - HAEFLING		9/20/2016 0:00
003807A0300	AMERICAN AVENUE - HAEFLING		12/14/2017 15:38
013803A0300	AMERICAN AVENUE - HAEFLING		12/14/2017 15:42
013803A0300	AMERICAN AVENUE - HAEFLING		5/14/2018 13:52
003807A0300	AMERICAN AVENUE - HAEFLING		5/15/2018 0:00
003807A0300	AMERICAN AVENUE - HAEFLING		9/21/2018 0:00
013803A0300	AMERICAN AVENUE - HAEFLING		1/28/2019 0:00
013803A0300	AMERICAN AVENUE - HAEFLING		5/10/2019 0:00
003807A0300	AMERICAN AVENUE - HAEFLING		11/25/2019 14:40
013803A0300	AMERICAN AVENUE - HAEFLING		11/27/2019 15:51
013803A0300	AMERICAN AVENUE - HAEFLING		9/22/2020 14:47
013803A0300	AMERICAN AVENUE - HAEFLING		9/22/2020 14:47
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		4/1/2016 8:50
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		9/15/2016 0:00
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		9/15/2016 0:00
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		12/14/2017 15:39
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		5/14/2018 13:52
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		9/24/2018 11:36
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		11/25/2019 14:40
003809A0300	AMERICAN AVENUE - U. K. MED CENTER		10/26/2020 14:23
003814B0300	ASHLAND AVENUE TAP		3/28/2016 17:20
003814B0300	ASHLAND AVENUE TAP		9/15/2016 0:00
003814B0300	ASHLAND AVENUE TAP		9/15/2016 0:00
003814B0300	ASHLAND AVENUE TAP		12/14/2017 15:40
003814B0300	ASHLAND AVENUE TAP		9/14/2018 15:15
003814B0300	ASHLAND AVENUE TAP		10/31/2019 15:39
003814B0300	ASHLAND AVENUE TAP		11/3/2020 13:53

011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	4/1/2016 8:53
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	9/20/2016 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	9/20/2016 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	9/20/2016 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	9/20/2016 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	9/20/2016 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	8/15/2017 13:12
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	8/16/2017 8:43
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	12/14/2017 15:35
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	4/29/2018 21:51
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	4/19/2019 0:00
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	8/30/2019 14:34
011003AB300	AVON - LOUDON AVENUE	(I-75 - Loudon Ave. Section)	11/4/2020 12:43
003512C0300	BRYANT ROAD TAP		3/29/2016 17:12
003512C0300	BRYANT ROAD TAP		9/15/2016 0:00
003512C0300	BRYANT ROAD TAP		9/15/2016 0:00
003512C0300	BRYANT ROAD TAP		9/15/2016 0:00
003512C0300	BRYANT ROAD TAP		9/15/2016 0:00
003512C0300	BRYANT ROAD TAP		5/21/2018 10:07
003512C0300	BRYANT ROAD TAP		9/12/2018 12:44
003512C0300	BRYANT ROAD TAP		8/13/2019 12:44
003512C0300	BRYANT ROAD TAP		4/7/2020 11:46

003512C0300	BRYANT ROAD TAP		6/8/2020 14:01
003512C0300	BRYANT ROAD TAP		11/13/2020 12:58
003806A0300	HIGBY MILL - AMERICAN AVENUE		3/30/2016 10:35
013802A0300	HIGBY MILL - AMERICAN AVENUE		3/30/2016 18:23
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/15/2016 0:00
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/15/2016 0:00
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/15/2016 0:00
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/15/2016 0:00
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/15/2016 0:00
013802A0300	HIGBY MILL - AMERICAN AVENUE		9/20/2016 0:00
013802A0300	HIGBY MILL - AMERICAN AVENUE		9/20/2016 0:00
013802A0300	HIGBY MILL - AMERICAN AVENUE		9/20/2016 0:00
003806A0300	HIGBY MILL - AMERICAN AVENUE		4/19/2017 14:49
013802A0300	HIGBY MILL - AMERICAN AVENUE		12/14/2017 15:42
013802A0300	HIGBY MILL - AMERICAN AVENUE		5/14/2018 13:52
013802A0300	HIGBY MILL - AMERICAN AVENUE		9/14/2018 15:14
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/21/2018 12:44
013802A0300	HIGBY MILL - AMERICAN AVENUE		1/1/2019 0:00
013802A0300	HIGBY MILL - AMERICAN AVENUE		5/10/2019 0:00
013802A0300	HIGBY MILL - AMERICAN AVENUE		10/31/2019 15:19
003806A0300	HIGBY MILL - AMERICAN AVENUE		10/31/2019 15:38
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/1/2020 15:17
003806A0300	HIGBY MILL - AMERICAN AVENUE		9/8/2020 13:25
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	1/4/2016 17:59
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	3/29/2016 17:15
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	9/20/2016 0:00
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	9/20/2016 0:00
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	9/20/2016 0:00
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	9/20/2016 0:00
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	12/14/2017 15:42
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	5/14/2018 13:52
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	1/1/2019 0:00
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	5/17/2019 0:00

013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	11/25/2019 14:45
013806A0300	HIGBY MILL - LANDSDOWNE	(Dbl. Cir. W/H.M.-Landsdowne 69kv Cir.)	10/21/2020 9:02
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	3/29/2016 9:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/14/2016 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/14/2016 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/14/2016 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/14/2016 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/21/2017 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	10/2/2017 0:00
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	12/14/2017 15:37
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	5/21/2018 10:07
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	9/12/2018 12:44
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	8/13/2019 12:44
003510A0300	HIGBY MILL - LANSDOWNE	(doub. circ. w/H. M. - Lansdowne 138kv)	10/21/2020 9:02
003811A0300	HIGBY MILL - U. K. MED CENTER		3/28/2016 17:19
003811A0300	HIGBY MILL - U. K. MED CENTER		9/15/2016 0:00
003811A0300	HIGBY MILL - U. K. MED CENTER		9/15/2016 0:00
003811A0300	HIGBY MILL - U. K. MED CENTER		9/21/2017 0:00
003811A0300	HIGBY MILL - U. K. MED CENTER		10/2/2017 0:00
003811A0300	HIGBY MILL - U. K. MED CENTER		12/14/2017 15:39
003811A0300	HIGBY MILL - U. K. MED CENTER		4/13/2018 21:49
003811A0300	HIGBY MILL - U. K. MED CENTER		9/14/2018 0:00
003811A0300	HIGBY MILL - U. K. MED CENTER		10/21/2020 8:30

003510C0300	HIGBY MILL (2) TAP		3/29/2016 17:10
003510C0300	HIGBY MILL (2) TAP		9/14/2016 0:00
003510C0300	HIGBY MILL (2) TAP		9/14/2016 0:00
003510C0300	HIGBY MILL (2) TAP		9/14/2016 0:00
003510C0300	HIGBY MILL (2) TAP		9/14/2016 0:00
003510C0300	HIGBY MILL (2) TAP		9/14/2016 0:00
003510C0300	HIGBY MILL (2) TAP		12/14/2017 15:37
003510C0300	HIGBY MILL (2) TAP		9/12/2018 12:44
003510C0300	HIGBY MILL (2) TAP		8/19/2019 8:45
002405D0300	HUGHES LANE TAP		4/5/2016 18:14
002405D0300	HUGHES LANE TAP		9/14/2016 0:00
002405D0300	HUGHES LANE TAP		9/14/2016 0:00
002405D0300	HUGHES LANE TAP		9/14/2016 0:00
002405D0300	HUGHES LANE TAP		9/14/2016 0:00
002405D0300	HUGHES LANE TAP		9/14/2016 0:00
002405D0300	HUGHES LANE TAP		6/22/2017 8:33
002405D0300	HUGHES LANE TAP		12/14/2017 15:36
002405D0300	HUGHES LANE TAP		4/17/2018 14:10
002405D0300	HUGHES LANE TAP		8/31/2018 11:31
002405D0300	HUGHES LANE TAP		2/27/2019 12:03
002405D0300	HUGHES LANE TAP		8/19/2019 11:27
002405D0300	HUGHES LANE TAP		9/28/2020 8:40
006111C0300	HUME ROAD TAP		4/4/2016 19:59
006111C0300	HUME ROAD TAP		9/19/2016 0:00
006111C0300	HUME ROAD TAP		9/19/2016 0:00
006111C0300	HUME ROAD TAP		9/19/2016 0:00
006111C0300	HUME ROAD TAP		12/14/2017 15:47
006111C0300	HUME ROAD TAP		5/21/2018 10:07
006111C0300	HUME ROAD TAP		11/27/2019 15:46
003810B0300	I.B.M. WEST TAP		4/1/2016 8:51
003810B0300	I.B.M. WEST TAP		9/15/2016 0:00
003810B0300	I.B.M. WEST TAP		9/15/2016 0:00

003810B0300	I.B.M. WEST TAP		12/14/2017 15:39
003810B0300	I.B.M. WEST TAP		4/5/2018 11:47
003810B0300	I.B.M. WEST TAP		8/23/2018 15:17
003810B0300	I.B.M. WEST TAP		10/27/2020 14:06
011011B0300	IBM NORTH TAP		3/24/2016 11:24
011011B0300	IBM NORTH TAP		9/20/2016 0:00
011011B0300	IBM NORTH TAP		9/20/2016 0:00
011011B0300	IBM NORTH TAP		9/20/2016 0:00
011011B0300	IBM NORTH TAP		9/20/2016 0:00
011011B0300	IBM NORTH TAP		9/20/2016 0:00
011011B0300	IBM NORTH TAP		12/14/2017 15:35
011011B0300	IBM NORTH TAP		4/13/2018 22:05
011011B0300	IBM NORTH TAP		8/23/2018 15:16
011011B0300	IBM NORTH TAP		8/30/2018 14:05
011011B0300	IBM NORTH TAP		8/19/2019 8:45
011011B0300	IBM NORTH TAP		10/26/2020 15:33
011013A0300	INNOVATION DRIVE - ADAMS		3/23/2016 16:34
011013A0300	INNOVATION DRIVE - ADAMS		3/24/2016 17:16

011013A0300	INNOVATION DRIVE - ADAMS		9/20/2016 0:00
011013A0300	INNOVATION DRIVE - ADAMS		9/20/2016 0:00
011013A0300	INNOVATION DRIVE - ADAMS		9/20/2016 0:00
011013A0300	INNOVATION DRIVE - ADAMS		9/20/2016 0:00
011013A0300	INNOVATION DRIVE - ADAMS		9/20/2016 0:00
011013A0300	INNOVATION DRIVE - ADAMS		6/26/2017 8:16
011013A0300	INNOVATION DRIVE - ADAMS		12/14/2017 15:35
011013A0300	INNOVATION DRIVE - ADAMS		9/21/2018 12:43
011013A0300	INNOVATION DRIVE - ADAMS		11/25/2019 14:43
011013A0300	INNOVATION DRIVE - ADAMS		5/1/2020 11:19
011013A0300	INNOVATION DRIVE - ADAMS		5/19/2020 10:18
005301D0300	KUNKLE TAP		3/28/2016 17:21
005301D0300	KUNKLE TAP		9/15/2016 0:00
005301D0300	KUNKLE TAP		9/15/2016 0:00

005301D0300	KUNKLE TAP		9/15/2016 0:00
005301D0300	KUNKLE TAP		4/19/2017 14:51
005301D0300	KUNKLE TAP		12/14/2017 15:46
005301D0300	KUNKLE TAP		5/21/2018 10:07
005301D0300	KUNKLE TAP		9/14/2018 15:16
005301D0300	KUNKLE TAP		11/25/2019 14:41
003512B0300	LAKESHORE TAP		3/29/2016 17:12
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		9/15/2016 0:00
003512B0300	LAKESHORE TAP		12/14/2017 15:37
003512B0300	LAKESHORE TAP		5/3/2018 9:52
003512B0300	LAKESHORE TAP		9/28/2018 11:12
003512B0300	LAKESHORE TAP		8/13/2019 12:44

003512B0300	LAKESHORE TAP		10/31/2019 15:46
003512B0300	LAKESHORE TAP		4/6/2020 14:12
003512B0300	LAKESHORE TAP		4/7/2020 8:17
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		3/29/2016 17:14
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/14/2016 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/14/2016 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/14/2016 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/14/2016 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/14/2016 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		4/19/2017 14:50
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		10/2/2017 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		12/14/2017 15:37
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		5/2/2018 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		9/12/2018 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		4/26/2019 0:00
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		8/13/2019 12:44
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		4/7/2020 11:46
003512A0300	LANSDOWNE - LOUDON AVE. (Doub. Circ.)		11/13/2020 12:58
003511A0300	LANSDOWNE - MOUNT TABOR		3/29/2016 17:10
003511A0300	LANSDOWNE - MOUNT TABOR		9/14/2016 0:00
003511A0300	LANSDOWNE - MOUNT TABOR		9/14/2016 0:00
003511A0300	LANSDOWNE - MOUNT TABOR		9/14/2016 0:00

003511A0300	LANSDOWNE - MOUNT TABOR		9/14/2016 0:00
003511A0300	LANSDOWNE - MOUNT TABOR		9/14/2016 0:00
003511A0300	LANSDOWNE - MOUNT TABOR		6/22/2017 8:33
003511A0300	LANSDOWNE - MOUNT TABOR		12/14/2017 15:37
003511A0300	LANSDOWNE - MOUNT TABOR		5/2/2018 13:06
003511A0300	LANSDOWNE - MOUNT TABOR		9/12/2018 12:45
003511A0300	LANSDOWNE - MOUNT TABOR		4/26/2019 0:00
003511A0300	LANSDOWNE - MOUNT TABOR		8/13/2019 12:44
003511A0300	LANSDOWNE - MOUNT TABOR		10/21/2020 12:35
003810A0300	LEXINGTON PLANT - HAEFLING		4/1/2016 8:51
003810A0300	LEXINGTON PLANT - HAEFLING		9/15/2016 0:00
003810A0300	LEXINGTON PLANT - HAEFLING		9/15/2016 0:00
003810A0300	LEXINGTON PLANT - HAEFLING		12/14/2017 15:39
003810A0300	LEXINGTON PLANT - HAEFLING		4/5/2018 11:47
003810A0300	LEXINGTON PLANT - HAEFLING		8/23/2019 14:18
003810A0300	LEXINGTON PLANT - HAEFLING		9/22/2020 14:29
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		4/5/2016 18:13
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		6/14/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		9/13/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		9/13/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		9/13/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		9/13/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		9/13/2016 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		6/22/2017 8:33
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		12/14/2017 15:36
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		4/6/2018 0:00

002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		8/31/2018 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		1/28/2019 0:00
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		8/19/2019 11:24
002405A0300	LEXINGTON PLANT - PARIS SWITCHING STATION		8/5/2020 7:40
005301A0300	LEXINGTON PLANT - PISGAH		3/28/2016 17:21
005301A0300	LEXINGTON PLANT - PISGAH		9/15/2016 0:00
005301A0300	LEXINGTON PLANT - PISGAH		9/15/2016 0:00
005301A0300	LEXINGTON PLANT - PISGAH		9/15/2016 0:00
005301A0300	LEXINGTON PLANT - PISGAH		11/27/2017 0:00
005301A0300	LEXINGTON PLANT - PISGAH		12/14/2017 15:46
005301A0300	LEXINGTON PLANT - PISGAH		4/13/2018 0:00
005301A0300	LEXINGTON PLANT - PISGAH		8/31/2018 0:00
005301A0300	LEXINGTON PLANT - PISGAH		8/29/2019 15:08
005301A0300	LEXINGTON PLANT - PISGAH		6/11/2020 8:49
005301A0300	LEXINGTON PLANT - PISGAH		6/19/2020 8:49
005301A0300	LEXINGTON PLANT - PISGAH		6/23/2020 8:52
003813A0300	LEXINGTON PLANT - RACE STREET		3/28/2016 17:20
003813A0300	LEXINGTON PLANT - RACE STREET		9/15/2016 0:00
003813A0300	LEXINGTON PLANT - RACE STREET		9/15/2016 0:00
003813A0300	LEXINGTON PLANT - RACE STREET		8/24/2017 14:24

003813A0300	LEXINGTON PLANT - RACE STREET		12/14/2017 15:40
003813A0300	LEXINGTON PLANT - RACE STREET		3/6/2018 0:00
003813A0300	LEXINGTON PLANT - RACE STREET		4/5/2018 11:47
003813A0300	LEXINGTON PLANT - RACE STREET		8/20/2018 0:00
003813A0300	LEXINGTON PLANT - RACE STREET		8/29/2019 15:15
003813A0300	LEXINGTON PLANT - RACE STREET		10/27/2020 13:43
011011A0300	LOUDON AVENUE - HAEFLING		3/24/2016 17:21
011011A0300	LOUDON AVENUE - HAEFLING		9/20/2016 0:00
011011A0300	LOUDON AVENUE - HAEFLING		9/20/2016 0:00
011011A0300	LOUDON AVENUE - HAEFLING		9/20/2016 0:00
011011A0300	LOUDON AVENUE - HAEFLING		9/20/2016 0:00
011011A0300	LOUDON AVENUE - HAEFLING		9/20/2016 0:00
011011A0300	LOUDON AVENUE - HAEFLING		6/22/2017 8:36
011011A0300	LOUDON AVENUE - HAEFLING		12/14/2017 15:34
011011A0300	LOUDON AVENUE - HAEFLING		5/17/2018 0:00
011011A0300	LOUDON AVENUE - HAEFLING		8/23/2018 0:00
011011A0300	LOUDON AVENUE - HAEFLING		8/30/2019 14:41
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		3/30/2016 18:23
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		9/14/2016 0:00
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		9/14/2016 0:00
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		9/14/2016 0:00
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		9/14/2016 0:00
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		6/22/2017 8:34
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		8/14/2017 15:56
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		8/15/2017 13:18
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		12/14/2017 15:36
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		8/23/2019 11:55
003506A0300	LOUDON AVENUE - LEXINGTON PLANT		9/16/2020 13:21

003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	3/31/2016 9:01
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	9/15/2016 0:00
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	9/15/2016 0:00
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	12/14/2017 15:40
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	4/5/2018 11:47
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	8/20/2018 13:50
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	8/30/2019 14:39
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	11/27/2019 15:50
003815AA300	LOUDON AVENUE - PARIS SWITCHING STATION	(LOUDON AVENUE - I-75 CROSSING SECTION)	11/4/2020 12:43
006111A0300	LOUDON AVENUE - WINCHESTER		4/4/2016 19:59
006111A0300	LOUDON AVENUE - WINCHESTER		7/5/2016 0:00
006111A0300	LOUDON AVENUE - WINCHESTER		9/19/2016 0:00
006111A0300	LOUDON AVENUE - WINCHESTER		9/19/2016 0:00
006111A0300	LOUDON AVENUE - WINCHESTER		9/19/2016 0:00
006111A0300	LOUDON AVENUE - WINCHESTER		8/16/2017 16:40
006111A0300	LOUDON AVENUE - WINCHESTER		8/17/2017 7:59
006111A0300	LOUDON AVENUE - WINCHESTER		12/14/2017 15:47
006111A0300	LOUDON AVENUE - WINCHESTER		4/19/2018 10:11
006111A0300	LOUDON AVENUE - WINCHESTER		4/20/2018 11:22
006111A0300	LOUDON AVENUE - WINCHESTER		5/3/2018 9:52
006111A0300	LOUDON AVENUE - WINCHESTER		8/31/2018 11:15
006111A0300	LOUDON AVENUE - WINCHESTER		8/30/2019 14:40
003806B0300	PARKERS MILL TAP		4/1/2016 8:49

005301E0300	PARKERS MILL TAP		4/1/2016 8:51
003806B0300	PARKERS MILL TAP		9/15/2016 0:00
003806B0300	PARKERS MILL TAP		9/15/2016 0:00
005301E0300	PARKERS MILL TAP		9/15/2016 0:00
005301E0300	PARKERS MILL TAP		9/15/2016 0:00
005301E0300	PARKERS MILL TAP		9/15/2016 0:00
003806B0300	PARKERS MILL TAP		12/14/2017 15:38
005301E0300	PARKERS MILL TAP		12/14/2017 15:46
003806B0300	PARKERS MILL TAP		4/5/2018 11:47
005301E0300	PARKERS MILL TAP		4/16/2018 0:00
003806B0300	PARKERS MILL TAP		8/30/2018 0:00
005301E0300	PARKERS MILL TAP		3/29/2019 0:00
005301E0300	PARKERS MILL TAP		8/29/2019 15:08
003806B0300	PARKERS MILL TAP		11/27/2019 15:49
003806B0300	PARKERS MILL TAP		4/27/2020 8:28
003806B0300	PARKERS MILL TAP		4/29/2020 8:21

003806B0300	PARKERS MILL TAP		6/3/2020 10:21
005301E0300	PARKERS MILL TAP		8/3/2020 10:15
005301E0300	PARKERS MILL TAP		8/3/2020 10:15
005301E0300	PARKERS MILL TAP		8/3/2020 11:31
003806B0300	PARKERS MILL TAP		11/13/2020 12:58
003806C0300	PICADOME TAP		3/30/2016 10:35
003806C0300	PICADOME TAP		9/15/2016 0:00
003806C0300	PICADOME TAP		9/15/2016 0:00
003806C0300	PICADOME TAP		12/14/2017 15:38
003806C0300	PICADOME TAP		5/25/2018 11:41
003806C0300	PICADOME TAP		9/28/2018 11:18
003806C0300	PICADOME TAP		8/19/2019 8:45
003806C0300	PICADOME TAP		11/27/2019 15:49
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	3/21/2016 16:17
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	7/5/2016 0:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	9/15/2016 0:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	9/15/2016 0:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	9/15/2016 0:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	12/3/2017 15:58
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	5/23/2018 10:06
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	9/30/2018 19:53
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	5/31/2019 0:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	11/27/2019 13:00
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	7/14/2020 14:46
005302AA300	PISGAH - TYRONE	(Pisgah - Str. #390-Dbl. Cir. Twr.)	7/16/2020 15:01
003807B0300	SCOTT STREET TAP		3/30/2016 18:25
003807B0300	SCOTT STREET TAP		9/15/2016 0:00
003807B0300	SCOTT STREET TAP		9/15/2016 0:00
003807B0300	SCOTT STREET TAP		12/14/2017 15:39
003807B0300	SCOTT STREET TAP		5/15/2018 12:59
003807B0300	SCOTT STREET TAP		9/28/2018 11:19
003807B0300	SCOTT STREET TAP		11/27/2019 15:49

003807B0300	SCOTT STREET TAP		10/26/2020 14:00
003804B0300	SPINDLETOP TAP		2/17/2016 0:00
003804B0300	SPINDLETOP TAP		3/23/2016 16:35
003804B0300	SPINDLETOP TAP		9/15/2016 0:00
003804B0300	SPINDLETOP TAP		9/15/2016 0:00
003804B0300	SPINDLETOP TAP		9/15/2016 0:00
003804B0300	SPINDLETOP TAP		9/15/2016 0:00
003804B0300	SPINDLETOP TAP		9/15/2016 0:00
003804B0300	SPINDLETOP TAP		6/22/2017 8:33
003804B0300	SPINDLETOP TAP		12/14/2017 15:38
003804B0300	SPINDLETOP TAP		5/25/2018 11:40
003804B0300	SPINDLETOP TAP		9/28/2018 11:18
003804B0300	SPINDLETOP TAP		11/27/2019 15:47
003804B0300	SPINDLETOP TAP		10/21/2020 15:37
005301C0300	TRAFTON AVENUE TAP		3/28/2016 17:21

005301C0300	TRAFTON AVENUE TAP		9/15/2016 0:00
005301C0300	TRAFTON AVENUE TAP		9/15/2016 0:00
005301C0300	TRAFTON AVENUE TAP		9/15/2016 0:00
005301C0300	TRAFTON AVENUE TAP		4/19/2017 14:51
005301C0300	TRAFTON AVENUE TAP		5/21/2018 10:07
005301C0300	TRAFTON AVENUE TAP		9/28/2018 11:22
005301C0300	TRAFTON AVENUE TAP		11/27/2019 15:50
005301C0300	TRAFTON AVENUE TAP		6/19/2020 8:49
005301C0300	TRAFTON AVENUE TAP		11/3/2020 13:53
003807D0300	U. K. WEST TAP (#412)		3/30/2016 18:29
003807D0300	U. K. WEST TAP (#412)		9/15/2016 0:00
003807D0300	U. K. WEST TAP (#412)		9/15/2016 0:00
003807D0300	U. K. WEST TAP (#412)		9/15/2016 0:00
003807D0300	U. K. WEST TAP (#412)		4/19/2017 14:52
003807D0300	U. K. WEST TAP (#412)		6/26/2017 8:15
003807D0300	U. K. WEST TAP (#412)		5/21/2018 10:07
003807D0300	U. K. WEST TAP (#412)		9/28/2018 11:20
003807D0300	U. K. WEST TAP (#412)		11/27/2019 15:56
003807D0300	U. K. WEST TAP (#412)		10/26/2020 14:01
003814A0300	U.K. MED CENTER - RACE STREET		3/28/2016 17:19
003814A0300	U.K. MED CENTER - RACE STREET		9/15/2016 0:00
003814A0300	U.K. MED CENTER - RACE STREET		9/15/2016 0:00
003814A0300	U.K. MED CENTER - RACE STREET		10/2/2017 0:00

003814A0300	U.K. MED CENTER - RACE STREET		12/14/2017 15:40
003814A0300	U.K. MED CENTER - RACE STREET		5/14/2018 13:37
003814A0300	U.K. MED CENTER - RACE STREET		9/14/2018 15:05
003814A0300	U.K. MED CENTER - RACE STREET		10/31/2019 15:39
003814A0300	U.K. MED CENTER - RACE STREET		10/27/2020 14:12
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	3/30/2016 18:25
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	9/15/2016 0:00
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	9/15/2016 0:00
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	12/14/2017 15:39
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	9/28/2018 11:19
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	11/27/2019 15:49
003807C0300	WEST HIGH STREET TAP	(Off the Amer. Ave.- Haef. Line)	11/27/2019 15:56
005301B0300	WEST HIGH STREET TAP		3/28/2016 17:21
005301B0300	WEST HIGH STREET TAP		9/15/2016 0:00
005301B0300	WEST HIGH STREET TAP		9/15/2016 0:00
005301B0300	WEST HIGH STREET TAP		9/15/2016 0:00
003814C0300	WEST HIGH STREET TAP		9/15/2016 0:00
003814C0300	WEST HIGH STREET TAP		9/15/2016 0:00
005301B0300	WEST HIGH STREET TAP		4/19/2017 14:50
003814C0300	WEST HIGH STREET TAP		12/14/2017 15:40
005301B0300	WEST HIGH STREET TAP		12/14/2017 15:46
005301B0300	WEST HIGH STREET TAP		5/21/2018 10:07
003814C0300	WEST HIGH STREET TAP		9/28/2018 11:21
005301B0300	WEST HIGH STREET TAP		9/28/2018 11:22
003814C0300	WEST HIGH STREET TAP		11/27/2019 15:50
003814C0300	WEST HIGH STREET TAP		10/26/2020 13:47
005301B0300	WEST HIGH STREET TAP		10/26/2020 13:48
015605A0300	WEST LEXINGTON - HAEFLING		1/4/2016 17:54
015605A0300	WEST LEXINGTON - HAEFLING		2/17/2016 0:00
015605A0300	WEST LEXINGTON - HAEFLING		3/24/2016 17:22
015605A0300	WEST LEXINGTON - HAEFLING		9/20/2016 0:00

015605A0300	WEST LEXINGTON - HAEFLING		9/20/2016 0:00
015605A0300	WEST LEXINGTON - HAEFLING		9/20/2016 0:00
015605A0300	WEST LEXINGTON - HAEFLING		11/20/2017 0:00
015605A0300	WEST LEXINGTON - HAEFLING		12/1/2017 0:00
015605A0300	WEST LEXINGTON - HAEFLING		12/14/2017 15:43
015605A0300	WEST LEXINGTON - HAEFLING		6/8/2018 8:34
015605A0300	WEST LEXINGTON - HAEFLING		9/28/2018 11:17
015605A0300	WEST LEXINGTON - HAEFLING		11/27/2019 15:47
015605A0300	WEST LEXINGTON - HAEFLING		4/7/2020 11:49
015605A0300	WEST LEXINGTON - HAEFLING		4/13/2020 9:43
015605A0300	WEST LEXINGTON - HAEFLING		4/17/2020 10:25
015605A0300	WEST LEXINGTON - HAEFLING		4/20/2020 10:19
015605A0300	WEST LEXINGTON - HAEFLING		11/13/2020 11:04
003510B0300	WILSON DOWNING TAP		3/29/2016 17:09
006103E0300	WILSON DOWNING TAP		3/29/2016 17:17
003510B0300	WILSON DOWNING TAP		9/14/2016 0:00
003510B0300	WILSON DOWNING TAP		9/14/2016 0:00
003510B0300	WILSON DOWNING TAP		9/14/2016 0:00
003510B0300	WILSON DOWNING TAP		9/14/2016 0:00
006103E0300	WILSON DOWNING TAP		9/19/2016 0:00
006103E0300	WILSON DOWNING TAP		9/19/2016 0:00
006103E0300	WILSON DOWNING TAP		9/19/2016 0:00
006103E0300	WILSON DOWNING TAP		9/19/2016 0:00
003510B0300	WILSON DOWNING TAP		6/22/2017 8:33

003510B0300	WILSON DOWNING TAP		12/14/2017 15:37
006103E0300	WILSON DOWNING TAP		9/28/2018 11:17
006103E0300	WILSON DOWNING TAP		8/13/2019 15:44
003510B0300	WILSON DOWNING TAP		8/19/2019 8:45
003510B0300	WILSON DOWNING TAP		11/27/2019 15:47
003510B0300	WILSON DOWNING TAP		10/21/2020 13:15

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 96

Responding Witness: Lonnie E. Bellar

Q-96. For each arborist employed by the Company in the last 10 years, please state the name of the arborist and the direct supervisor of the arborist and additionally whether the arborist was (a) an ISA Certified Arborist or (b) an ISA Certified Arborist Utility Specialist.

A-96. Transmission employed the following arborist:

Michael Daukas (retired in 2015) – Transmission Right-of-Way Coordinator-ISA Certified Arborist and an ISA Certified Arborist Utility Specialist. His direct supervisor was the Group Leader of Construction, who was neither (a) nor (b).

The company currently uses contract ISA Certified Arborists to support transmission vegetation management. Company employees provide oversight of the contract arborists.

Distribution employed the following arborists:

- Billy Moore-ISA Certified Arborist (retired May 2017). Succeeded by Clinton Lester-ISA Certified Arborist.
- Mike Canfield-ISA and Utility Certified Arborist (retired December 2020). Succeeded by Dustin Bruner-ISA and Utility Certified Arborist.
- Manager William Wheeler ISA and Utility Certified Arborist (retired August 2013). Succeeded by Terry Wright ISA Certified Arborist.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 97

Responding Witness: Lonnie E. Bellar

Q-97. For the recent clear cutting of trees under transmission lines (median trees) on Fayette County's Southpoint Drive, please list for each such tree so cut, the type of tree, the height of the tree cut, the distance from the top of the tree to the power line, why tree trimming was not considered or employed, and the type of the tree planted in the cut tree's stead and a link to the regulation, law or order that required the trees to be cleared and not trimmed.

A-97. The Company removed 53 median trees under the transmission line along Southpoint Drive in Fayette County. The Company does not have specific information regarding the tree species, the height of the trees removed, or the distance from the top of the tree to the power line. See Q98b for the type of trees planted.

The Company is not aware of any law or order requiring the trees to be cleared and not trimmed. The Company elected to remove the trees located within their existing easement due to their location under the transmission line and their potential impact to the safe and reliable operation of the transmission network.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 98

Responding Witness: Lonnie E. Bellar

Q-98. For the recent clear cutting of street trees in the easement along Southpoint Drive please answer the following:

a. What was the reason(s) why the trees were cut down? Please state the number of trees cut and the type and height of the trees cut.

b. Have the trees been replaced? If yes, please state the tree type, If not, why not.

c. Prior to cutting the trees, did KU obtain a permit from LFUCG? In cutting the street trees did KU comply with Chapter 17b of the LFUCG Code of Ordinances? If not, why not?

A-98.

a. The Company elected to remove the trees located within their existing easement due to their location under the transmission line and their potential impact to the safe and reliable operation of the transmission network.

b. The Company worked with representatives from LFUCG to develop a "replanting plan" along Southpoint Drive. This plan was implemented in December 2020. The plan includes the following vegetation species:

- Sargent Crabapple,
- Jane Magnolia,
- Bottlebrush Buckeye,
- Winterberry,
- Prague Viburnum,
- Forsythia, and
- Fothergilla.

c. No, KU did not obtain a permit from LFUCG prior to cutting the trees along Southpoint Drive because such trees are located within existing easements expressly granting KU the right to trim or remove such trees.

KENTUCKY UTILITIES COMPANY

Response to Lexington-Fayette Urban County Government's Request for Information Dated January 8, 2021

Case No. 2020-00349

Question No. 99

Responding Witness: Lonnie E. Bellar

Q-99. For the planned tree cutting on Lansdowne Drive in Fayette County set to begin February 1, 2021, please list for each planned tree so cut, the type of tree, the height of the tree cut, the distance from the top of the tree to the power line, why tree trimming was not considered or employed, and the type of the tree planted in the cut tree's stead and a link to the regulation, law or order that required the trees to be cleared and not trimmed.

A-99. See attached for those trees within the median along Lansdowne Drive.

The company does not have records regarding the distance from the top of each tree to the power line. The company is working with LFUCG representatives to develop a "replanting plan" along Lansdowne Drive. The Company is electing to remove the trees located within their existing easement due to their location under the transmission line and their potential impact to the safe and reliable operation of the transmission network. The Company is not aware of any regulation, law or order requiring the trees to be cleared and not trimmed.

Lansdowne Drive Median Tree Data			
Median	Species	Current Height	Action
Median 01	Crabapple	13.5	Remove
Median 02	Hawthorn	15.5	Remove
Median 02	Hawthorn	15.5	Remove
Median 02	Hawthorn	15.5	Remove
Median 02	Hawthorn	15.5	Remove
Median 02	Hawthorn	15.5	Remove
Median 03	Crabapple	15.5	Remove
Median 03	Crabapple	13.5	Remove
Median 03	Crabapple	19.5	Remove
Median 03	Crabapple	13.5	Remove
Median 03	Crabapple	13.5	Remove
Median 03	Crabapple	10	Remove
Median 03	Crabapple	10	Remove
Median 03	Crabapple	14	Remove
Median 03	Crabapple	12	Remove
Median 03	Crabapple	13.5	Remove
Median 03	Crabapple	12	Remove
Median 03	Apple	10	Remove
Median 04	Crabapple	16	Remove
Median 05	Crabapple	13	Remove
Median 05	Crabapple	13	Remove
Median 06	Crabapple	13	Remove
Median 08	Crabapple	13	Remove
Median 08	S. Magnolia	17	Remove
Median 08	Rubbertree	15	Remove
Median 08	S. Magnolia	17	Remove
Median 08	S. Magnolia	17	Remove
Median 08	S. Magnolia	13	Remove
Median 08	S. Magnolia	17	Remove
Median 08	S. Magnolia	17	Remove
Median 09	Crabapple	13	Remove
Median 09	Crabapple	13	Remove
Median 09	Hawthorn	14	Remove
Median 09	Hawthorn	15	Remove
Median 09	Hawthorn	12	Remove
Median 09	Hawthorn	13	Remove
Median 09	Hawthorn	13	Remove
Median 09	kousa dogwood	10	Prune
Median 09	kousa dogwood	12	Prune
Median 09	kousa dogwood	10	Prune
Median 09	Rubbertree	15	Remove
Median 09	Rubbertree	20	Remove
Median 10	Rubbertree	20	Remove
Median 10	Rubbertree	20	Remove
Median 10	Hawthorn	10	Remove
Median 10	Hawthorn	10	Remove
Median 10	Hawthorn	10	Remove
Median 10	Hawthorn	14	Remove
Median 10	Hawthorn	10	Remove
Median 10	kousa dogwood	6	Prune
Median 10	kousa dogwood	10	Prune
Median 10	kousa dogwood	6	Prune

Median 10	kousa dogwood	6	Prune
Median 11	Crabapple	18	Remove
Median 11	Crabapple	18	Remove
Median 11	Crabapple	18	Remove
Median 11	Crabapple	20	Remove
Median 11	Crabapple	18	Remove
Median 11	Crabapple	18	Remove
Median 11	Crabapple	12	Remove
Median 11	Crabapple	6	Remove
Median 11	Rubbertree	15	Remove
Median 11	Hawthorn	6	Remove
Median 12	Crabapple	12	Remove
Median 12	Crabapple	15	Remove
Median 12	Crabapple	12	Remove
Median 12	Crabapple	10	Remove
Median 12	Crabapple	10	Remove
Median 12	Crabapple	10	Remove
Median 12	Crabapple	10	Remove
Median 12	Rubbertree	15	Remove
Median 12	Hawthorn	18	Remove
Median 12	Hawthorn	18	Remove
Median 12	Hawthorn	24	Remove
Median 12	Hawthorn	15	Remove
Median 12	Hawthorn	12	Remove
Median 12	Hawthorn	12	Remove
Median 12	Hawthorn	16	Remove
Median 12	Hawthorn	12	Remove
Median 12	Hawthorn	17	Remove
Median 12	Hawthorn	10	Remove
Median 13	Crabapple	10	Remove
Median 13	Crabapple	12	Remove
Median 13	Crabapple	15	Remove
Median 13	Crabapple	15	Remove
Median 13	Crabapple	12	Remove
Median 13	Crabapple	10	Remove
Median 13	Crabapple	16	Remove
Median 13	Crabapple	13	Remove
Median 13	Crabapple	13	Remove
Median 13	Rubbertree	20	Remove
Median 13	Rubbertree	15	Remove
Median 13	kousa dogwood	10	Prune
Median 13	kousa dogwood	8	Prune
Median 13	kousa dogwood	10	Prune
Median 13	kousa dogwood	10	Prune
Median 13	kousa dogwood	10	Prune
Median 14	Hawthorn	10	Remove
Median 14	Hawthorn	8	Remove
Median 14	Hawthorn	30	Remove
Median 14	Hawthorn	15	Remove
Median 14	Hawthorn	18	Remove
Median 14	Hawthorn	16	Remove
Median 14	Hawthorn	14	Remove
Median 14	Hawthorn	15	Remove
Median 14	Hawthorn	10	Remove

Median 14	Hawthorn	13	Remove
Median 14	Rubbertree	13	Remove
Median 14	Rubbertree	14	Remove
Median 15	S. Magnolia	18	Remove
Median 15	S. Magnolia	18	Remove
Median 15	S. Magnolia	18	Remove
Median 15	S. Magnolia	18	Remove
Median 16	Hawthorn	19	Remove
Median 16	Hawthorn	14	Remove
Median 16	Hawthorn	8	Remove
Median 16	Rubbertree	15	Remove
Median 16	Rubbertree	18	Remove
Median 16	kousa dogwood	10	Prune
Median 16	kousa dogwood	10	Prune
Median 16	kousa dogwood	12	Prune
Median 16	kousa dogwood	10	Prune
Median 17	Crabapple	14	Remove
Median 17	Crabapple	14	Remove
Median 17	Crabapple	15	Remove
Median 17	Crabapple	14	Remove
Median 17	Crabapple	16	Remove
Median 17	Crabapple	14	Remove
Median 17	Hawthorn	10	Remove
Median 17	Hawthorn	10	Remove
Median 17	Hawthorn	15	Remove
Median 17	Hawthorn	14	Remove
Median 17	Hawthorn	14	Remove
Median 17	Blue spruce	28	Remove
Median 17	S. Magnolia	22	Remove
Median 17	S. Magnolia	22	Remove
Median 17	S. Magnolia	22	Remove