

Experimental Company Owned LED Streetlight Program

Russell Township Meeting
July 28, 2017



the
Illuminating[®]
Company

A FirstEnergy Company



July 03, 2017

Account Number: 110 024 369 420

Billing Period: Jun 01 to Jun 30, 2017 for 30 days
Bill For: TWP OF RUSSELL
TOWN HALL
8450 KINSMAN RD STREET
NOVELTY OH 44072

Amount Due: \$575.05

Due Date: August 02, 2017

To report an emergency or an outage, call 24 hours a day 1-888-544-4877. For Customer Service, call 1-800-589-3101. For Payment Options, call 1-800-686-9601. Pay your bill online at www.firstenergycorp.com

Bill Issued by: The Illuminating Company, PO Box 3687, Akron OH 44309-3687

Messages	Account Summary	Amount Due
To avoid a 1.50% Late Payment Charge being added to your bill, please pay the Amount Due by the Due Date.	Previous Balance	551.31
	Payments/Adjustments	-551.31
	Balance at Billing on Jul 03, 2017	0.00
Energy Efficiency 3,346 KWH x 0.000682 \$2.28	The Illuminating Company - Lighting	575.05
Peak Demand Reduction 3,346 KWH x 0.000170 \$0.57	Amount Due by Aug 02, 2017	\$575.05
Renewable Energy 3,346 KWH x 0.000470 \$1.57	Charges From The Illuminating Company	
In Case No. 17-0336-EL-RDR, the Public Utilities Commission of Ohio approved the Rider GEN charges effective June 1, 2017. Customers taking generation service from the company's Standard Service Offer will receive new prices for Rider GEN as of June 1, 2017.	Customer Number: 0800781138 1950000025	
Tree branches and shrubs - and insects that nest in vegetation - can make it difficult and, at times, unsafe for our employees to read your meter. Please be sure your meter is easily accessible by clearing the path to it and the area around it.	Rate: Street Lighting CE-STLF	
For a brochure describing your customer rights and obligations, please call our Customer Service phone number.	Fixture Description Units	
	CE-CO-MV-OHWD-(104)-250W 8	
	CE-CO-MV-OHWD-(158)-400W 3	
	CE-CO-MV-OHWD-(68)-175W 19	
	CE-CO-SV-OHWD-(105)-250W 1	
	CE-CO-SV-OHWD-(42)-100W 6	
	CE-CO-SV-OHWD-(62)-150W 6	
	Distribution Fixture Charges	385.58
	Distribution Related Component	30.74
	Cost Recovery Charges	6.58
	Bypassable Generation and Transmission Related Component	152.15
	Current Consumption Bill Charges	\$75.05
	Detail Payment and Adjustment Information	
	06/09/17 Payment	-551.31

Additional messages, if any, can be found on back.

Return this part with a check or money order payable to The Illuminating Company



76 South Main Street
Akron, OH 44308-1890

TWP OF RUSSELL
TOWN HALL
PO BOX 522
NOVELTY OH 44072-0522

Account Number: 110 024 369 420

Amount Paid	
Amount Due	\$575.05
Due Date	Aug 02, 2017

THE ILLUMINATING COMPANY
PO BOX 3687
AKRON OH 44309-3687

0411002436942000000000000000000000000000000575050000575056

Customer Number: 0800791138 1950000025

Rate: Street Lighting CE-STLF

Fixture Description

Units

CE-CO-MV-OHWD-(104)-250W

8

CE-CO-MV-OHWD-(158)-400W

3

CE-CO-MV-OHWD-(69)-175W

19

CE-CO-SV-OHWD-(105)-250W

1

CE-CO-SV-OHWD-(42)-100W

6

CE-CO-SV-OHWD-(62)-150W

6

} = 43

Distribution Fixture Charges

385.58

Distribution Related Component

30.74

Cost Recovery Charges

6.58

Bypassable Generation and Transmission Related Component

152.15

Current Consumption Bill Charges

575.05

Detail Payment and Adjustment Information

06/09/17 Payment

-551.31

CO=Company Owned	MV=Mercury Vapor	ST=Steel
CU=Customer Owned	FL=Flourescent	WD=Wood
CM=Customer Owned Limited Maintenance	IN=Incandescent	UG=Underground
	SV= High Pressure Sodium Vapor	PL=Pole
	MH= Metal Halide	PS=Post
		TW- Twin
		UP=Underpass Lighting
		OH=overhead
		SA=Special Architectural

Lum=Lumen
Conc.=Concrete
PL=Pole
ST=Steel
Dual or Du=Dual Lamps
O&L=Ornamental with Luminaire
HC=Highway Center
HS=Highway Side
Sp=Special
EONLY*=Energy Only with Limited Maintenance
Elim= Eliminated
Nav.=Navigational
OLM=Optional Limited Maintenance



**TWP OF RUSSELL
Billed Account Summary**

Account Nbr 110024369420
 Customer Nbr 08007911381950000025
 Customer Acct Id TOWN HALL
 Move in/out Date 01/01/1979 - Active Account
 Service Address 8450 KINSMAN RD STREET
 NOVELTY OH 44072
 No meter - Street Lights

Meter Read Unit I231599
 Meter Constant N/A
 Voltage Level Secondary, voltage unknown
 Capacity Peak Load 0.0000
 Load Profile SL
 Supplier Name N/A
 Supplier Dual Bill No
 Trans Peak Load Rate 0.0000
 CE-STLF
 EDI Billing No

Meter Nbr(s)

CURRENT 12 MONTHS							PREVIOUS 12 MONTHS						
DATE	KVAR	DEMAND	KWH	\$	¢/KWH	DATE	KVAR	DEMAND	KWH	\$	¢/KWH		
Jun-17			3,346	575.05	17.19	Jun-16			3,373	593.91	17.61		
May-17			3,346	551.31	16.48	May-16			3,311	562.00	16.97		
Apr-17			3,346	551.31	16.48	Apr-16			3,311	562.00	16.97		
Mar-17			3,373	561.33	16.64	Mar-16			3,311	565.80	17.09		
Feb-17			3,373	561.33	16.64	Feb-16			3,311	565.80	17.09		
Jan-17			3,373	561.33	16.64	Jan-16			3,311	565.80	17.09		
Dec-16			3,373	561.04	16.63	Dec-15			3,364	559.61	16.64		
Nov-16			3,373	561.04	16.63	Nov-15			3,391	558.18	16.46		
Oct-16			3,373	561.04	16.63	Oct-15			3,391	558.18	16.46		
Sep-16			3,373	557.71	16.53	Sep-15			3,391	550.44	16.23		
Aug-16			3,373	585.49	17.36	Aug-15			3,391	586.76	17.30		
Jul-16			3,373	585.49	17.36	Jul-15			3,391	586.76	17.30		
TOTAL			40,395	6,773.47	16.77	TOTAL			40,247	6,815.24	16.93		

P.U.C.O. No. 13



**SCHEDULE OF RATES
FOR
ELECTRIC SERVICE**

Filed pursuant to Order dated May 27, 2009, in Case No. 08-935-EL-SSO et al., before

The Public Utilities Commission of Ohio

Issued by: Richard R. Grigg, President

Effective: June 1, 2009

EXPERIMENTAL COMPANY OWNED LED LIGHTING PROGRAM

AVAILABILITY:

This program is being offered on an experimental basis through December 31, 2019. Available to municipalities and governmental authorities that elect to take service from The Cleveland Electric Illuminating Company owned light-emitting diode (LED) lights for the lighting of streets, sidewalks, parks, and other public grounds.

This experimental program is only available to new customers and customers currently taking service under the Company Owned program under Street Lighting Service (Rate STL), sheet No. 31. A minimum installation of 12 LED lights per customer is required for participation.

GENERAL PROVISIONS:

Unless otherwise noted, the terms of sheet No. 30 (Street Lighting Provisions) shall apply.

METERING:

Standard street lighting service shall be unmetered with monthly kilowatt hour consumption determined using rated capacity multiplied by average burn hours.

BURN HOURS AND MONTHLY KWH CONSUMPTION:

Unless otherwise noted, all lamps shall be operated by photoelectric control or by time clocks, with hours of operation from dusk to dawn, 4,200 hours per annum.

The following monthly Kilowatt-hour values shall be used for billing purposes.

Light Type	Bulb Rating (Lumens)	Bulb Rating (Watts)	kWh per Month
Cobra Head	4,000	50	18
Cobra Head	7,000	90	32
Cobra Head	11,500	130	46
Cobra Head	24,000	260	91
Acorn	2,500	50	18
Acorn	5,000	90	32
Colonial	2,500	50	18
Colonial	5,000	90	32

COSTS OF INSTALLATION:

The Company will install LED lighting fixtures on approved existing poles. The customer shall not be required to pay for the cost of the LED fixture or its installation prior to taking service under this experimental program. However, any additional and new lighting equipment installed by the Company at the request of the customer, including but not limited to poles, brackets, secondary, transformation, etc., not provided for herein, shall be the property of the Company and be paid for by the customer prior to the customer taking service under this experimental program.

Filed pursuant to Orders dated November 20, 2014 and October 12, 2016 in Case Nos. 14-1027-EL-ATA
and 16-470-EL-ATA, before

The Public Utilities Commission of Ohio

EXPERIMENTAL COMPANY OWNED LED LIGHTING PROGRAM**CHANGES IN NUMBER, SIZE, TYPE OR LOCATION:**

Costs associated with activities related to the replacement, relocation, alteration, repair, or removal of existing street lighting equipment are not included as part of normal maintenance and will be the responsibility of the customer. Examples of such activities include, but are not limited to, the replacement of an existing fixture, remaining costs of existing infrastructure, removal or relocation of a lamp, luminaire, bracket, and/or pole, or installation of a luminaire shield.

REMAINING COSTS OF EXISTING INFRASTRUCTURE:

In cases where an existing light is being replaced by an LED light on existing Company owned infrastructure, the customer is responsible for the remaining costs of the existing light, pole and all associated infrastructure prior to installation of the LED light. For each existing light that is being replaced, the remaining costs of the existing infrastructure are to be paid by the customer, in the amount of \$301 per fixture, prior to the customer taking service under this experimental program.

RESPONSIBILITIES FOR OWNERSHIP, MAINTENANCE AND REPLACEMENT:

All lighting components including lamp, refractor, luminaire, ballast, pole, bracket, and other supporting materials shall be owned by the Company. All service and necessary maintenance will be performed only during the regular working hours of the Company. If service and necessary maintenance cannot be performed during regular working hours of the Company, for reasons beyond the Company's control, the incremental costs of performing such work shall be borne by the customer.

RATE:

Monthly charges per customer for all customers served under this schedule shall include Distribution Charges per fixture per month, as shown below.

Distribution Charges:

Light Type	Bulb Rating (Lumens)	Bulb Rating (Watts)	Monthly Charge per Fixture
Cobra Head	4,000	50	\$7.39
Cobra Head	7,000	90	\$9.24
Cobra Head	11,500	130	\$9.82
Cobra Head	24,000	260	\$15.13
Acorn	2,500	50	\$19.44
Acorn	5,000	90	\$20.53
Colonial	2,500	50	\$11.74
Colonial	5,000	90	\$12.90

Filed pursuant to Orders dated November 20, 2014 and October 12, 2016 in Case Nos. 14-1027-EL-ATA
and 16-470-EL-ATA, before

The Public Utilities Commission of Ohio

EXPERIMENTAL COMPANY OWNED LED LIGHTING PROGRAM

CUSTOMER CANCELLATION:

This experimental program will be offered through December 31, 2019, unless cancelled earlier.

Customers may opt off of this lighting program to the Company's Street Lighting Service, Company Owned schedule with 60 days advanced written notice. Customers electing to opt off of the experimental program shall be responsible for all costs associated with removing the LED lights, including the remaining costs of the existing infrastructure that would otherwise be recoverable absent the customer opting off this program. Opting off this program shall not affect or impair the Company's ownership rights of the LED Lights.

OTHER PROVISIONS:

All energy savings associated with customer participation under this experimental program shall count toward The Cleveland Electric Illuminating Company's energy efficiency and peak demand reduction requirements arising as a result of Section 4928.66, Revised Code and associated Ohio Administrative Code provisions.

APPLICABLE RIDERS:

Unless otherwise noted, all rider charges applicable to Rate STL as designated on the Summary Rider, Tariff Sheet 80, shall be added to the Rates and charges set forth above for customers participating under this experimental program.

Filed pursuant to Orders dated November 20, 2014 and October 12, 2016 in Case Nos. 14-1027-EL-ATA
and 16-470-EL-ATA, before

The Public Utilities Commission of Ohio

Issued by: Steven E. Strah, President

Effective: June 1, 2016



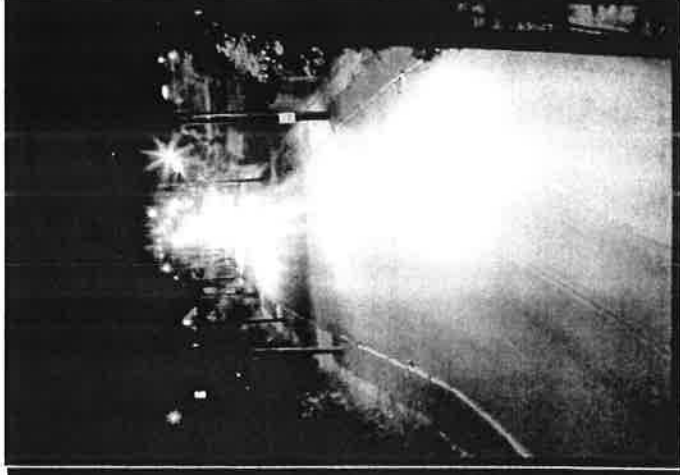
LED capability

LED Replacement Recommendations

- 100 Watt HPS / 175 Watt Mercury = ~50 Watt LED
- 150 Watt HPS / 250 Watt Mercury = ~90 Watt LED
- 200 Watt HPS / 250 Watt HPS = ~130 Watt LED
- 400 Watt HPS = ~260 Watt LED



Before: 250 Watt HPS



After: 130 Watt LED

LED

Streetlight Fact Sheet Cobrahead Roadway Lighting

The Illuminating Company now offers LED street lighting on an experimental basis.

LED streetlights provide many advantages over traditional lighting, including:

- Longer life span – projected 50,000+ hours
- Greater energy efficiency
- Reduced maintenance costs
- Faster turn on and turn off

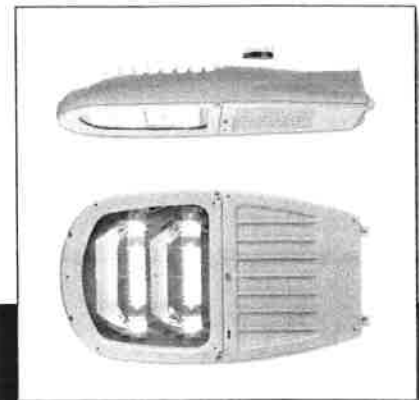
Currently, the approved manufacturers are Acuity and General Electric. Each LED fixture will appear on the municipality's bill. The municipality's decision to install street lighting will not affect its ability to choose an alternate electricity supplier.

The costs shown below include energy, labor and fixture costs associated with the installation of a new LED streetlight. (Some installation costs are not included – See FAQs.)

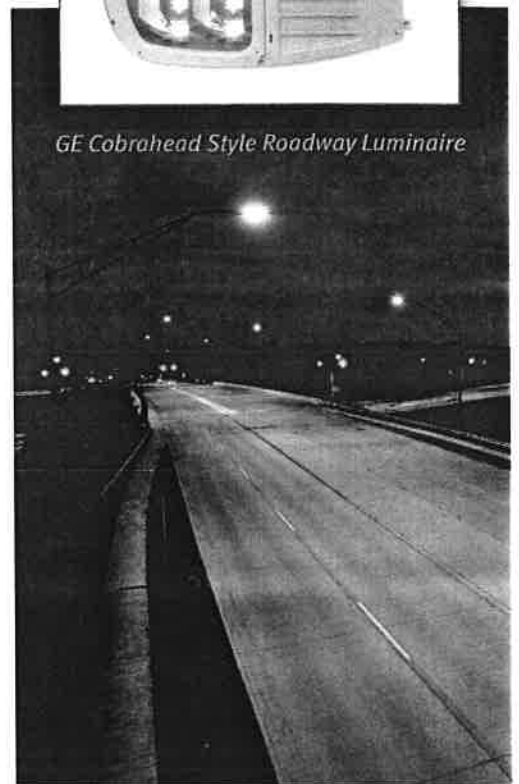
Watts/kWh per month	50/18	90/32	130/46	260/91
Lumens	4,000	7,000	11,500	24,000
Energy @ \$0.06/kWh*	\$1.08	\$1.92	\$2.76	\$5.46
Fixture	\$7.39	\$9.24	\$9.82	\$15.13
Total Monthly Cost**	\$8.47	\$11.16	\$12.58	\$20.59

* The costs shown are based on an average total price of \$0.06 per kWh. These costs will fluctuate depending on the actual rate, the current price-to-compare and if the customer chooses an alternate electricity supplier.

** In addition to Total Monthly Cost, the customer may be responsible for additional rider charges per the streetlight tariff.



GE Cobrahead Style Roadway Luminaire



(over)

For a cost comparison, the chart below lists information about other traditional streetlight options. Although some customers currently have Mercury Vapor (MV) streetlights installed, high-pressure sodium (HPS) vapor streetlights are now the only available alternative to LEDs.

Type	MV	HPS			
Watts/kWh per month	175/69	100/42	150/62	250/105	400/163
Lumens	7,700	9,500	16,000	27,500	50,000
Energy @ \$0.06/kWh*	\$4.14	\$2.52	\$3.72	\$6.30	\$9.78
Fixture	\$7.39	\$10.29	\$10.95	\$13.19	\$15.16
Total Monthly Cost**	\$11.53	\$12.81	\$14.67	\$19.49	\$24.94

* The costs shown are based on an average total price of \$0.06 per kWh. These costs will fluctuate depending on the actual rate, the current price-to-compare and if the customer chooses an alternate electricity supplier.

** In addition to Total Monthly Cost, the customer may be responsible for additional riders per the tariff.

FAQs

What is not included in the installation costs?

Other types of equipment, such as mast arms, poles, transformers, brackets and supply lines to the lighting location, are used to support or provide energy to the LED fixtures. Many of these items are already found at existing locations and can be used to support conversion to LED without any additional costs. For new locations or conversions requiring changes to such equipment, the cost of equipment will be calculated and charged in advance of construction. The monthly cost of the actual LED light can be found in the tariff at www.firstenergycorp.com/oh-tariffs.

Is there a minimum order?

Yes, a customer must have a minimum of 12 LED streetlights installed with each contract in order to participate in the experimental program.

How much energy will I save using LED lights compared to traditional street lighting?

Energy savings vary greatly depending on many variables, but LEDs can use about half as many watts to produce the same amount of light. You also could increase your savings by choosing smaller lights where appropriate.

Is an up-front payment required to replace existing streetlights?

Yes. There is a \$301 cost for replacing each existing non-LED fixture.

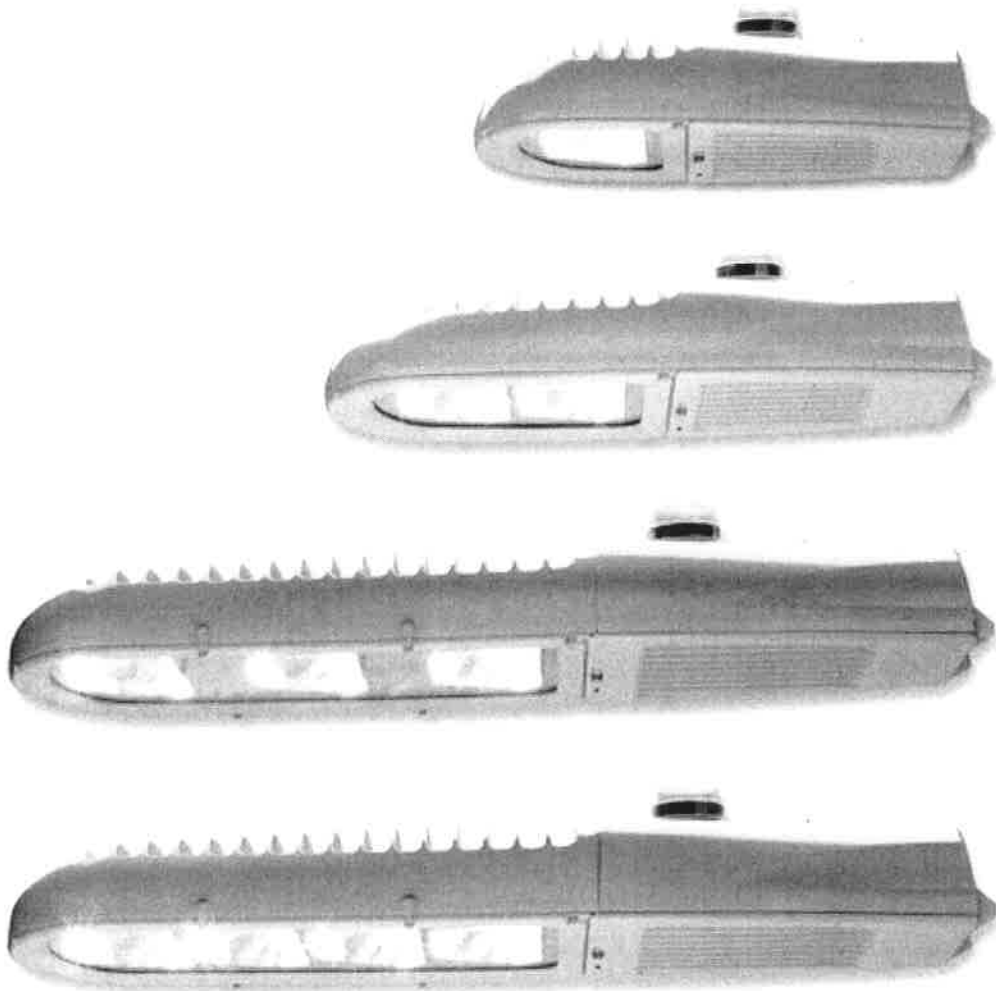
For more information on LED street lighting, please call 1-800-589-3101.

**the
Illuminating
Company**
A FirstEnergy Company

GE
Lighting Solutions

Evolve™ LED Roadway Lighting

Scalable Cobrahead (ERS1, ERS2, ERS3 & ERS4)



imagination at work

Product Features

From local to major roadways, the GE Evolve™ LED Roadway Scalable Cobrahead fixtures are changing the way you light your lanes. Preserving the aesthetic look of traditional roadway Cobrahead fixtures, GE balances the technical needs of a sophisticated LED system with the functional demands of an outdoor fixture facing extreme weather hazards. GE's advanced LED optical design offers hundreds of photometric options to meet your precise lighting requirements, while delivering reduced glare and improved light control. The refined thermal management system incorporates a sleek and robust heat sink directly into the fixture to ensure maximum heat transfer and long LED life.

The GE Evolve LED Roadway Scalable Cobrahead offers more than 11 years of reliable service life to significantly reduce maintenance frequency and expense, based on a 50,000 hour life and 12 hours of operation per day. This efficient fixture can yield up to a 50-percent reduction in system energy compared with standard HID systems, depending on roadway applications, and can also be paired with programmable dimming options for even greater savings and control.

Applications

- Designed to meet recommended luminance and illuminance requirements for local to major roadway / street classifications.

Housing

- Die cast aluminum housing.
- A modern design preserving the aesthetic look of traditional roadway Cobrahead fixtures incorporates the heat sink directly into the unit ensuring maximum heat transfer and long LED life.
- Meets 2G vibration per C136.31-2010 For 3G rating contact manufacturer.
- Power door assembly with removable retention latch.



LED & Optical Assembly

- Structured LED array for optimized roadway photometric distribution.
- Evolve light engine consisting of scalable reflective technology designed to optimize application efficiency and minimize glare.
- Reverse facing light engine options available.
- Utilizes high brightness LEDs, 70 CRI at 4000K & 5700K typical.
- LM-79 tests and reports are performed in accordance with IESNA standards.

Lumen Maintenance

- System rating is L85 at 50,000 hours. Contact manufacturer for Lxx rating (Lumen Depreciation) beyond 50,000 hours.

Ratings

- /e  listed, suitable for wet locations per UL 1598.
- IP65 rated optical enclosure per ANSI C136.25-2009.
- Temperature rated at -40° to 50°C (-40° to 45°C for ERS4 347-480V fixtures).
- Upward Light Output Ratio (ULOR) = 0.

Mounting

- Slipfitter with +/- 5 degree of adjustment for leveling.
- Integral die cast mounting pipe stop feature.
- Wildlife intrusion protection at mounting pipe entry.
- Adjustable for 1.25 in. or 2 in. mounting pipe.

Finish

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

Electrical

- 120-277 volt and 347-480 volt available.
- System power factor is >90% and THD <20%.*
- Class "A" audible sound rating.
- Integral surge protection:
 - For 120-277VAC per IEEE/ANSI C62.41.-1991, 6kV/3kA Location Category B3 (120 Events).
- Optional high capability surge protection per IEEE/ANSI C62.41.2-2002.
 - Rating 1 - 10kV/5kA Location Category (120 events).
 - Rating 2 - 6kV/3kA Location Category C-Low (5000 events).
- EMI: Title 47 CFR Part 15 Class A.
- Photo electric sensors (PE) available for all voltages.

** System power factor and THD is tested and specified at 120V input and maximum load conditions.*

Warranty

- 5-year limited system warranty standard.

Ordering Number Logic

Scalable (oh) ahead (ERS1)



ERS1

5

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve	0 = 120 - 277 H = 347 - 480		AX = Extra Narrow Asymmetric (Medium)	5 = 525mA*	40 = 4000K 57 = 5700K	1 = None 2 = PE Rec. 4 = PE Rec. with Shorting Cap 5 = PE Rec. with Control 7 = Dimming PE Receptacle *† 9 = Dimming PE Receptacle with Shorting Cap †	BLCK = Black GRAY = Gray Contact manufacturer for other colors.	C = IEC Construction E = GE Level F = Fusing L = Tool-Less Entry P = Programmable Dimming (includes DALI) T = Extra Surge Protection* XXX = Special Options * Contact manufacturer for details and availability.
R = Roadway	1 = 120* 2 = 208*		BX = Narrow Asymmetric (Medium)	*Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.		PE control not available for multi-volt 346-480V. Must be a discrete voltage (347V or 480V).		
S = Scalable	3 = 240* 4 = 277* 5 = 480* D = 347*		CX = Asymmetric (Short)			* Order dimming control PE as a separate item		
1 = Optical Assembly	*Specify single voltage only if fuse option is selected.		DX = Asymmetric Forward (Very Short)			† When ordering PE function socket 7 or 9, a programmable dimming option "P" must also be ordered under the "OPTIONS" column		
			EX = Asymmetric (Medium)					

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE		IES FILE NUMBERS	
		4000K	5700K	120-277V	347-480V	4000K	5700K
AX	AX	3100	3300	43	47	454886	454889
BX		4100	4400	54	59	454887	454890
CX		5100	5500	67	74	454888	454891
AX	BX	3300	3400	43	47	454669	454668
BX		4300	4600	54	59	454670	454667
CX		5300	5700	67	74	454659	454666
AX	CX	3200	3400	43	47	454662	454663
BX		4200	4500	54	59	454661	454665
CX		5200	5600	67	74	454660	454665
AX	DX	3300	3500	43	47	454892	454895
BX		4300	4600	54	59	454893	454896
CX		5300	5700	67	74	454894	454897
AX	EX	3000	3200	43	47	454653	454644
BX		4000	4300	54	59	454652	454645
CX		5000	5400	67	74	454651	454646

Photometrics

Scalable Cobrahead (ERS3)

ISO Plot

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

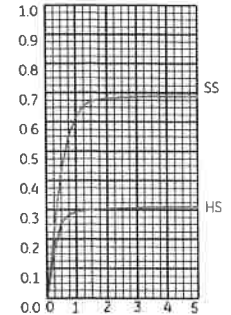
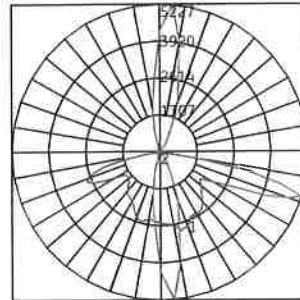
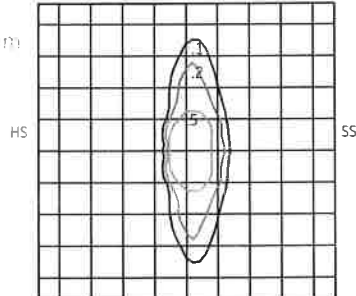
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

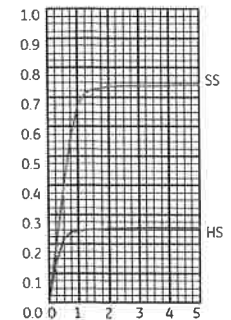
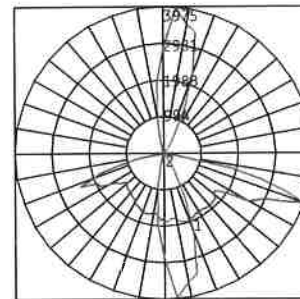
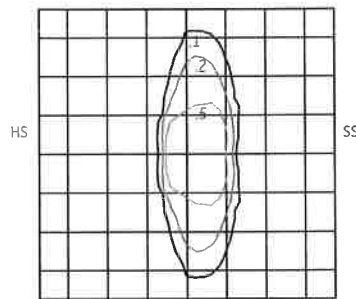
CU Graph

Coefficients of Utilization Street Width / Mounting Height

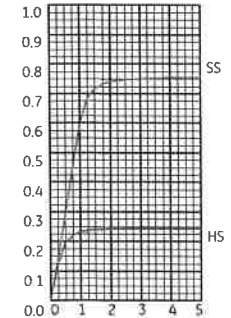
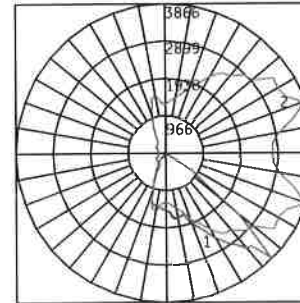
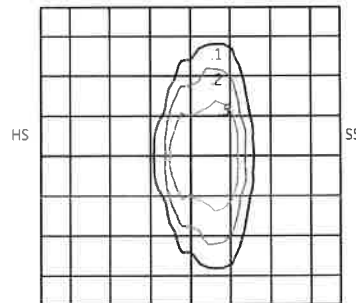
ERS3
Extra Narrow Asymmetric Medium
(CXAX)
5,500 Lumens
5700K
GE454891.ies



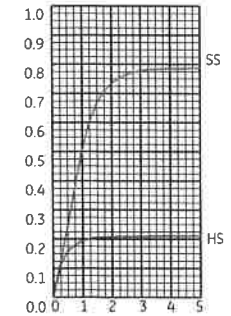
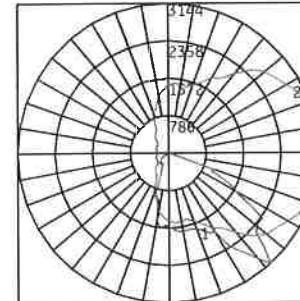
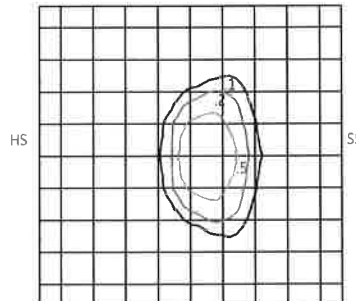
ERS3
Narrow Asymmetric Medium
(CXBX)
5,700 Lumens
5700K
GE454666.ies



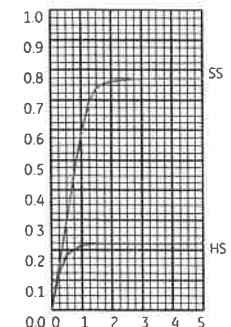
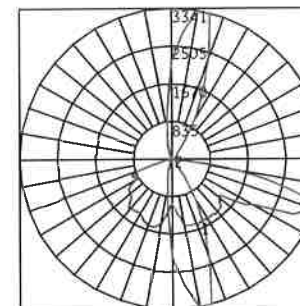
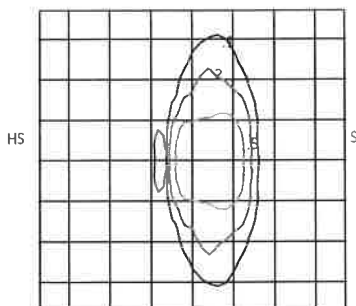
ERS3
Asymmetric Short
(CXCX)
5,600 Lumens
5700K
GE454665.ies



ERS3
Asymmetric Forward Very Short
(CXDX)
5,700 Lumens
5700K
GE454897.ies

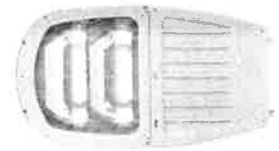


ERS3
Asymmetric Medium
(CXEX)
5,400 Lumens
5700K
GE454646.ies



Ordering Number Logic

Scalable Colorhead (ERS2)



ERS 2

5

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve	0 = 120 - 277 H = 347 - 480		AX = Extra Narrow Asymmetric (Medium)	5 = 525mA*	40 = 4000K 57 = 5700K	1 = None 2 = PE Rec. 4 = PE Rec. with Shorting Cap 5 = PE Rec. with Control 7 = Dimming PE Receptacle *† 9 = Dimming PE Receptacle with Shorting Cap †	BLCK = Black GRAY = Gray Contact manufacturer for other colors.	C = IEC Construction D = Dimming (525mA) E = GE Level F = Fusing L = Tool-Less Entry P = Programmable Dimming (includes DALI) T = Extra Surge Protection* XXX = Special Options * Contact manufacturer for details and availability
R = Roadway	1 = 120* 2 = 208* 3 = 240* 4 = 277* 5 = 480* D = 347*		BX = Narrow Asymmetric (Medium)	*Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.		PE control not available for multi-volt 347-480V. Must be a discrete voltage (347V or 480V)		
S = Scalable			CX = Asymmetric (Short)					
2 = Optical Assembly			DX = Asymmetric Forward (Very Short)					
			EX = Asymmetric (Medium)					

* Specify single voltage only if fuse option is selected.

* Order dimming control PE as a separate item

† When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE		IES FILE NUMBERS	
		4000K	5700K	120-277V	347-480V	4000K	5700K
DX	AX	6000	6500	82	89	454898	454903
EX		7000	7500	94	102	454899	454904
FX		8000	8600	106	114	454900	454905
GX		9000	9700	118	127	454901	454906
HX		10000	10800	130	140	454902	454907
DX	BX	6300	6800	82	89	454684	454683
EX		7300	7900	94	102	454685	454682
FX		8400	9000	106	114	454686	454681
GX		9400	10100	118	127	454687	454680
HX		10500	11300	130	140	454688	454643
DX	CX	6200	6700	82	89	454675	454674
EX		7300	7800	94	102	454676	454673
FX		8300	8900	106	114	454677	454672
GX		9300	10000	118	127	454678	454671
HX		10300	11100	130	140	454679	454641
DX	DX	6300	6800	82	89	454908	454913
EX		7300	7900	94	102	454909	454914
FX		8400	9000	106	114	454910	454915
GX		9400	10100	118	127	454911	454916
HX		10400	11200	130	140	454912	454917
DX	EX	6000	6400	82	89	454658	454650
EX		6900	7400	94	102	454657	454649
FX		7900	8500	106	114	454656	454647
GX		8800	9500	118	127	454655	454648
HX		9900	10600	130	140	454654	454642

House side photometry options available (using reverse facing light engines). Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS 2)

ISO Plot

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

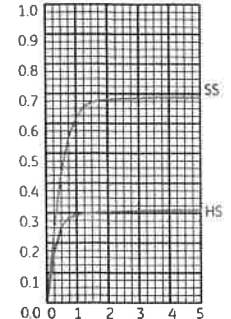
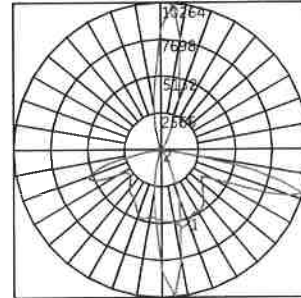
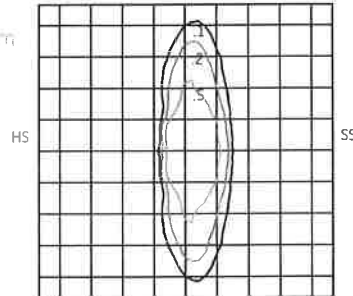
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

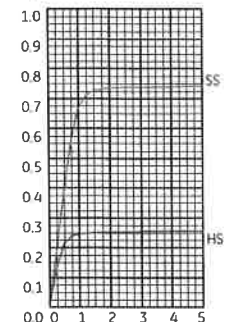
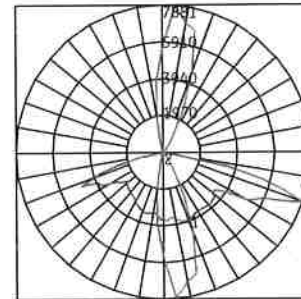
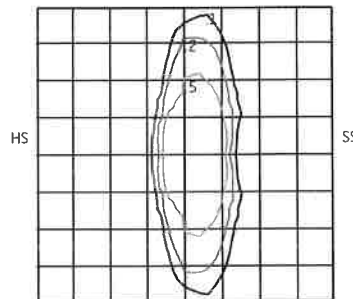
CU Graph

Coefficients of Utilization Street Width / Mounting Height

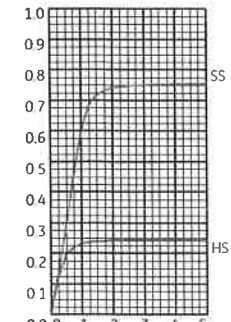
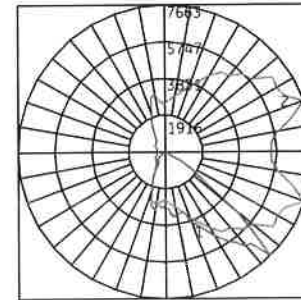
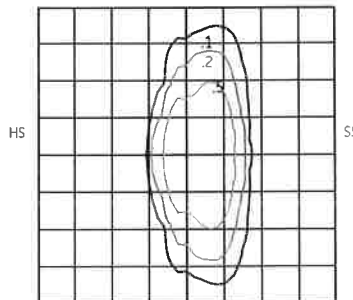
ERS2
Extra Narrow Asymmetric Medium
(HXAX)
10,800 Lumens
5700K
GE454907.ies



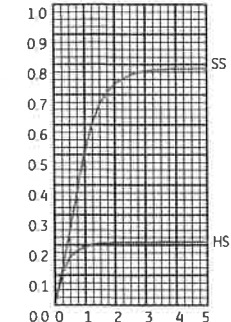
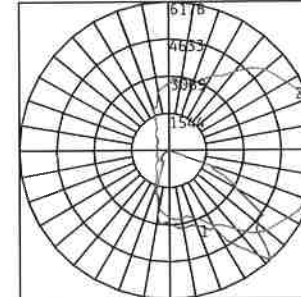
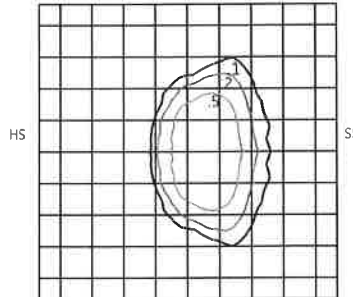
ERS2
Narrow Asymmetric Medium
(HXBX)
11,300 Lumens
5700K
GE454643.ies



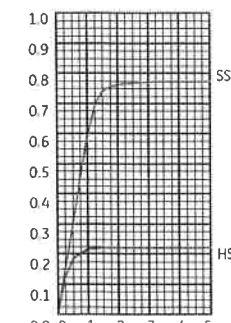
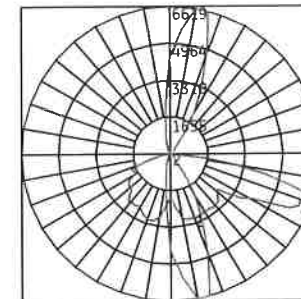
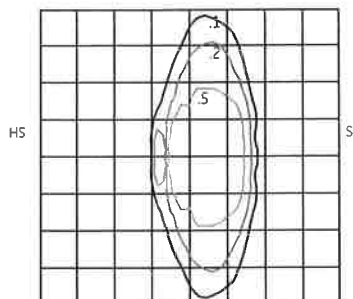
ERS2
Asymmetric Short
(HXCX)
11,100 Lumens
5700K
GE454641.ies



ERS2
Asymmetric Forward Very Short
(HXDX)
11,200 Lumens
5700K
GE454917.ies



ERS2
Asymmetric Medium
(HXEX)
10,600 Lumens
5700K
GE454642.ies



Ordering Number Logic

Scalable Cabrohead (ERS3)



ERS3

5

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve	0 = 120 - 277 H = 347 - 480		AX = Extra Narrow Asymmetric (Medium)	5 = 525mA*	40 = 4000K 57 = 5700K	1 = None 2 = PE Rec. 4 = PE Rec. with Shorting Cap 5 = PE Rec. with Control 7 = Dimming PE Receptacle *† 9 = Dimming PE Receptacle with Shorting Cap †	BLCK = Black GRAY = Gray Contact manufacturer for other colors.	C = IEC Construction D = Dimming (525mA) E = GE Level F = Fusing L = Tool-Less Entry P = Programmable Dimming (includes DALI) T = Extra Surge Protection* XXX = Special Options
R = Roadway	1 = 120* 2 = 208* 3 = 240* 4 = 277* 5 = 480* D = 347*		BX = Narrow Asymmetric (Medium)	*Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.		PE control not available for multi-volt 347-480V. Must be a discrete voltage (347V or 480V).		* Contact manufacturer for details and availability.
S = Scalable			CX = Asymmetric (Short)					
3 = Optical Assembly			DX = Asymmetric Forward (Very Short)					
			EX = Asymmetric (Medium)					

*Specify single voltage only if fuse option is selected.

† When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE		IES FILE NUMBERS	
		4000K	5700K	120-277V	347-480V	4000K	5700K
JX	AX	11100	11900	148	164	454918	454923
KX		12100	13000	159	177	454919	454924
LX		13100	14100	172	191	454920	454925
MX		14000	15000	183	204	454921	454926
NX		14800	15900	196	218	454922	454927
JX	BX	11600	12500	148	164	454928	454933
KX		12600	13600	159	177	454929	454934
LX		13700	14700	172	191	454930	454935
MX		14700	15800	183	204	454931	454936
NX		15500	16700	196	218	454932	454937
JX	CX	11400	12300	148	164	454938	454943
KX		12500	13400	159	177	454939	454944
LX		13500	14500	172	191	454940	454945
MX		14400	15500	183	204	454941	454946
NX		15300	16400	196	218	454942	454947
JX	DX	11500	12400	148	164	454958	454963
KX		12600	13600	159	177	454959	454964
LX		13700	14700	172	191	454960	454965
MX		14600	15700	183	204	454961	454966
NX		15400	16600	196	218	454962	454967
JX	EX	10900	11700	148	164	454948	454953
KX		11900	12800	159	177	454949	454954
LX		12800	13800	172	191	454950	454955
MX		13800	14800	183	204	454951	454956
NX		14500	15600	196	218	454952	454957

House side photometry options available (using reverse facing light engines). Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS3)

IES Plot

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

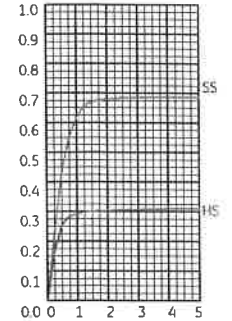
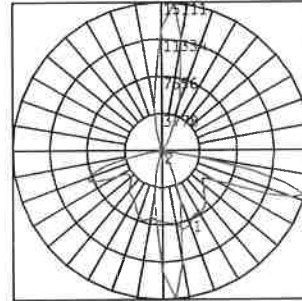
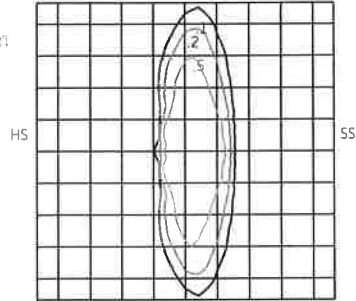
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

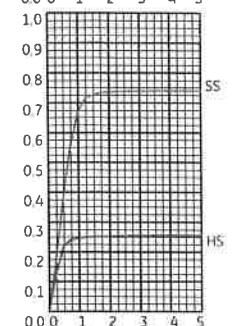
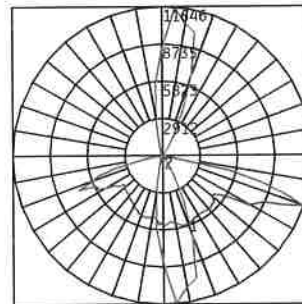
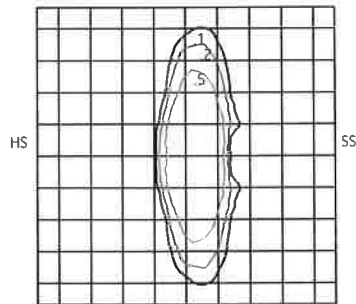
CU Graph

Coefficients of Utilization Street Width / Mounting Height

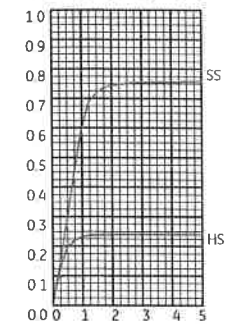
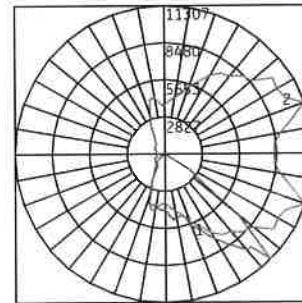
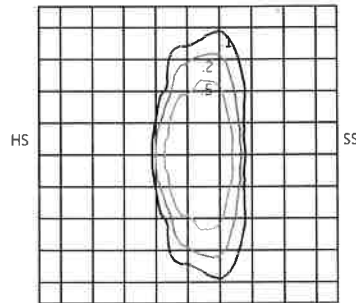
ERS3
Extra Narrow Asymmetric Medium
(NXAX)
15,900 Lumens
5700K
GE454927.ies



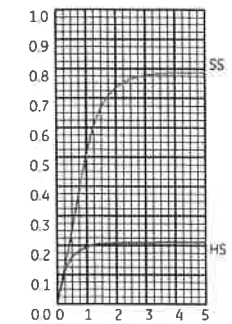
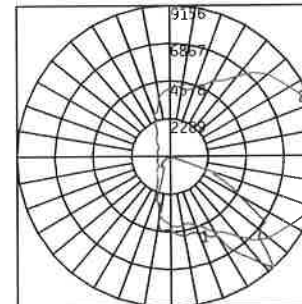
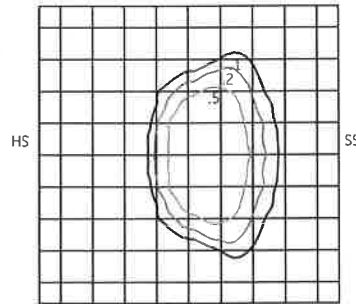
ERS3
Narrow Asymmetric Medium
(NXBX)
16,700 Lumens
5700K
GE454937.ies



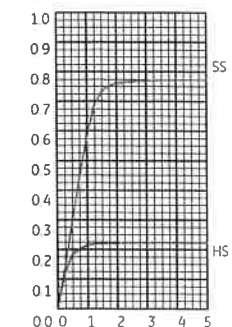
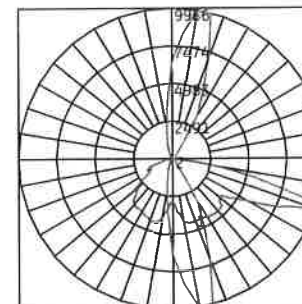
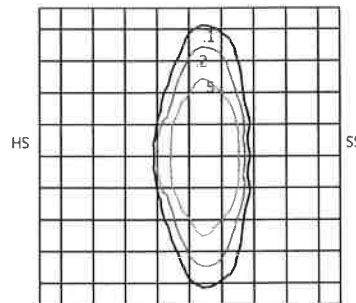
ERS3
Asymmetric Short
(NXCX)
16,400 Lumens
5700K
GE454947.ies



ERS3
Asymmetric Forward Very Short
(NXDX)
16,600 Lumens
5700K
GE454967.ies

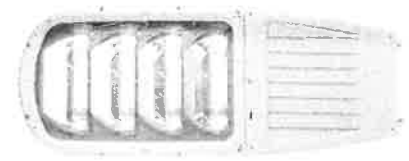


ERS3
Asymmetric Medium
(NXEX)
15,600 Lumens
5700K
GE454957.ies



Ordering Number Logic

Si-able Cobrohead (ERS4)



ERS4

5

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve	0 = 120 - 277		AX = Extra Narrow Asymmetric (Medium)	5 = 525mA*	40 = 4000K	1 = None	BLCK = Black	C = IEC Construction
R = Roadway	H = 347 - 480				57 = 5700K	2 = PE Rec.	GRAY = Gray	D = Dimming (525mA)
S = Scalable	1 = 120*		BX = Narrow Asymmetric (Medium)	*Standard drive current is 525mA, 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.		4 = PE Rec. with Shorting Cap	Contact manufacturer for other colors.	E = GE Level
4 = Optical Assembly	2 = 208*		CX = Asymmetric (Short)			5 = PE Rec. with Control		F = Fusing
	3 = 240*		DX = Asymmetric Forward (Medium)			7 = Dimming PE Receptacle *†		L = Tool-Less Entry
	4 = 277*		EX = Asymmetric (Medium)			9 = Dimming PE Receptacle with Shorting Cap †		P = Programmable Dimming (includes DALI)
	5 = 480*							T = Extra Surge Protection*
	D = 347*							XXX = Special Options
								* Contact manufacturer for details and availability.

*Specify single voltage only if fuse option is selected.

† When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS		TYPICAL SYSTEM WATTAGE		IES FILE NUMBERS	
		4000K	5700K	120-277V	347-480V	4000K	5700K
PX	AX	15900	17100	209	232	454968	454973
QX		16700	18000	222	246	454969	454974
RX		17600	18900	235	261	454970	454975
SX		18500	19900	244	271	454971	454976
TX		19400	20900	258	287	454972	454977
PX	BX	16600	17900	209	232	454978	454983
QX		17500	18800	222	246	454979	454984
RX		18400	19800	235	261	454980	454985
SX		19400	20900	244	271	454981	454986
TX		20400	21900	258	287	454982	454987
PX	CX	16400	17600	209	232	454988	454993
QX		17200	18500	222	246	454989	454994
RX		18100	19500	235	261	454990	454995
SX		19100	20500	244	271	454991	454996
TX		20000	21500	258	287	454992	454997
PX	DX	16600	17800	209	232	455008	455013
QX		17400	18700	222	246	455009	455014
RX		18300	19700	235	261	455010	455015
SX		19300	20800	244	271	455011	455016
TX		20300	21800	258	287	455012	455017
PX	EX	15600	16800	209	232	454998	455003
QX		16400	17600	222	246	454999	455004
RX		17300	18600	235	261	455000	455005
SX		18100	19500	244	271	455001	455006
TX		19100	20500	258	287	455002	455007

House side photometry options available (using reverse facing light engines). Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS4)

IEC Plot

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

Polar Curve

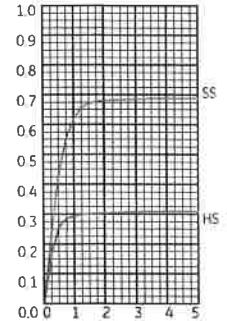
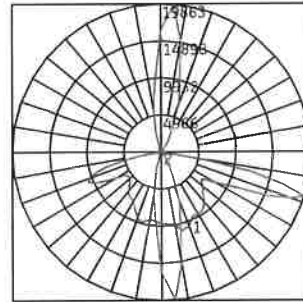
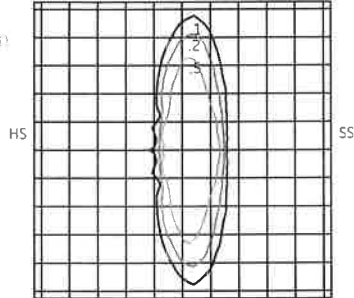
Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

CU Graph

Coefficients of Utilization Street Width / Mounting Height

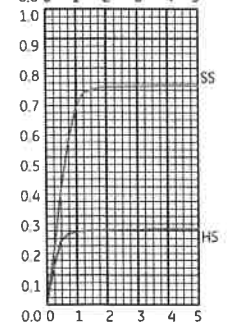
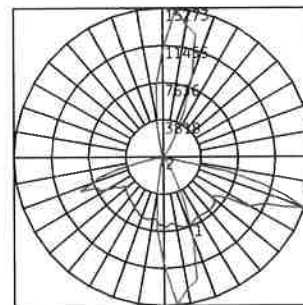
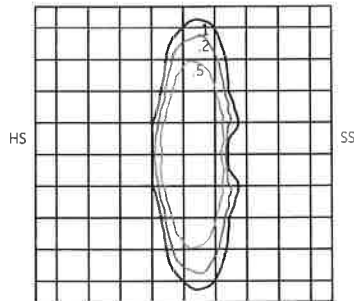
ERS4
Extra Narrow Asymmetric Medium
(TXAX)

20,900 Lumens
5700K
GE454977.ies



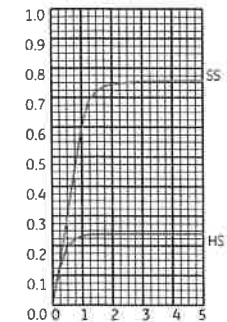
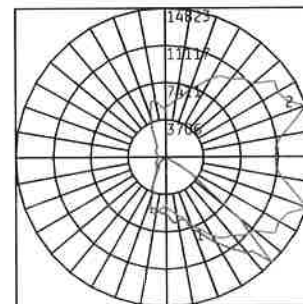
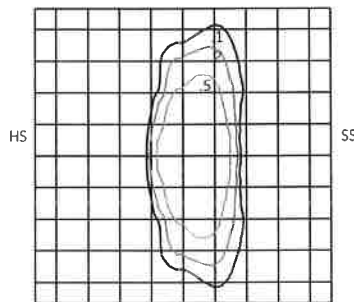
ERS4
Narrow Asymmetric Medium
(TXBX)

21,900 Lumens
5700K
GE454987.ies



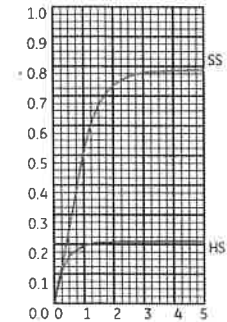
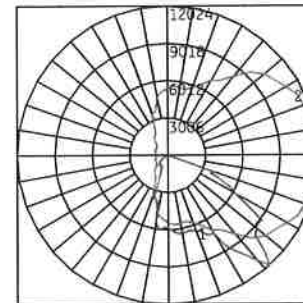
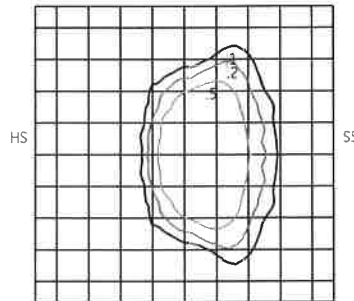
ERS4
Asymmetric Short
(TXCX)

21,500 Lumens
5700K
GE454997.ies



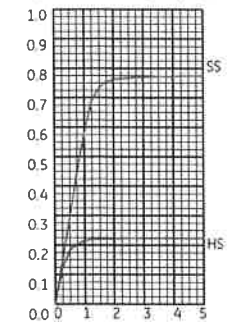
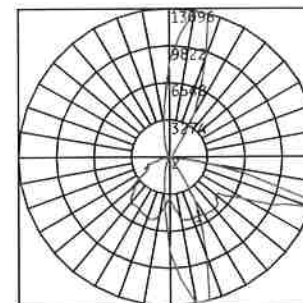
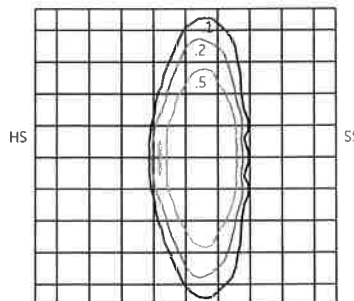
ERS4
Asymmetric Forward Very Short
(TXDX)

21,800 Lumens
5700K
GE455017.ies



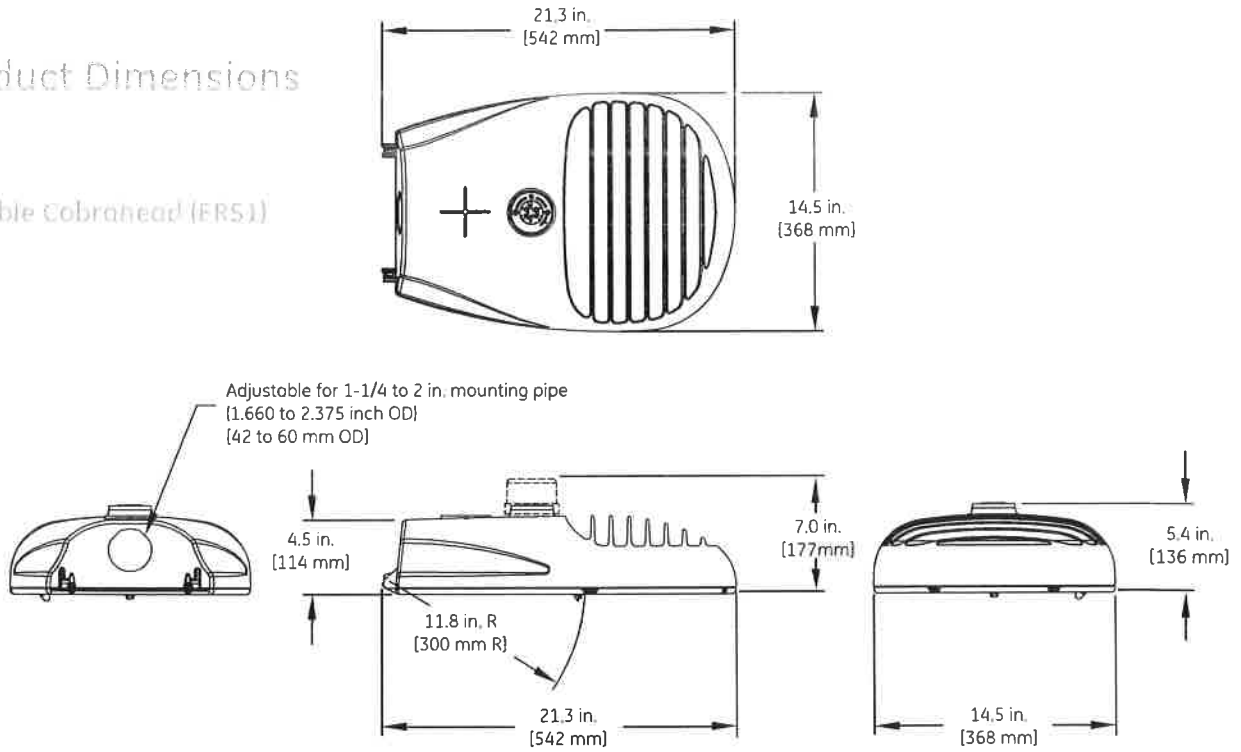
ERS4
Asymmetric Medium
(TXEX)

20,500 Lumens
5700K
GE455007.ies



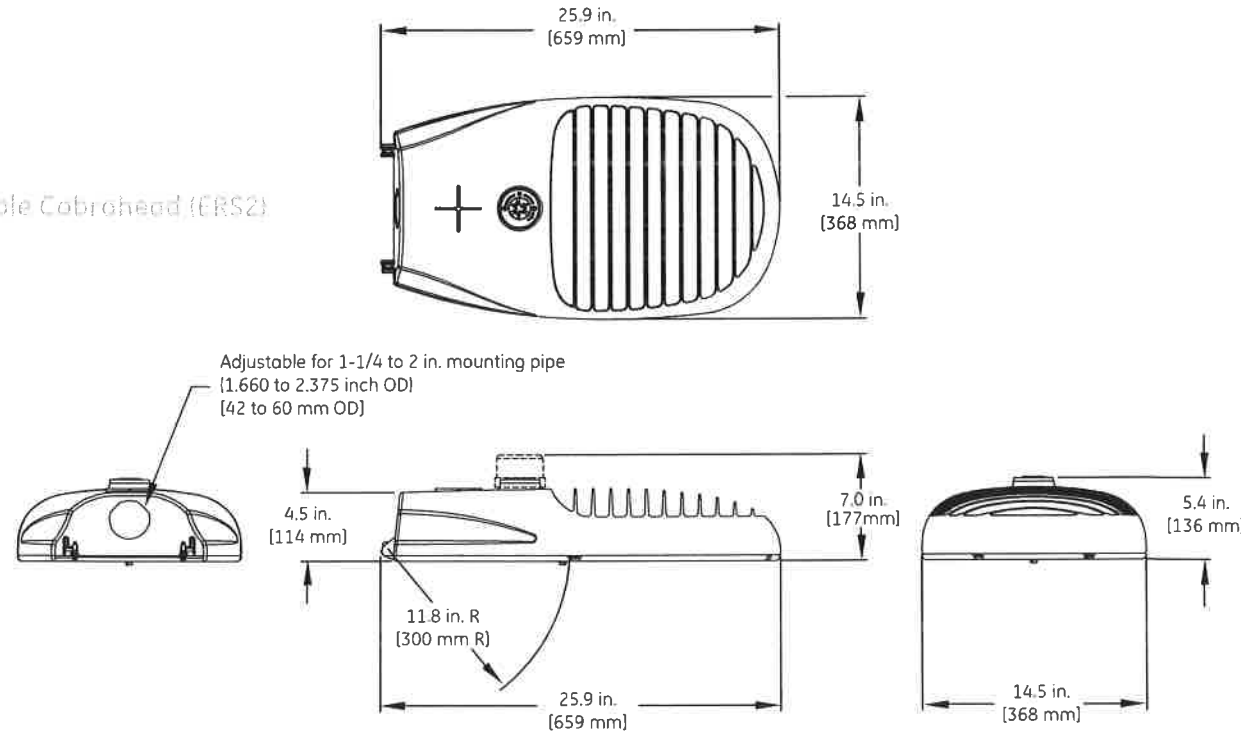
Product Dimensions

Scalable Cobrahead (ERS1)



DATA	<ul style="list-style-type: none"> • Approximate Net Weight: 20 to 25 lbs. (9.07 to 11.34 kgs.) Contact manufacturer for specific configuration weight.
	<ul style="list-style-type: none"> • Effective Projected Area (EPA): 0.5 sq. ft. max (0.046 sq. m)

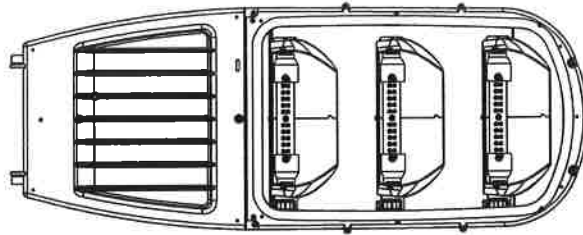
Scalable Cobrahead (ERS2)



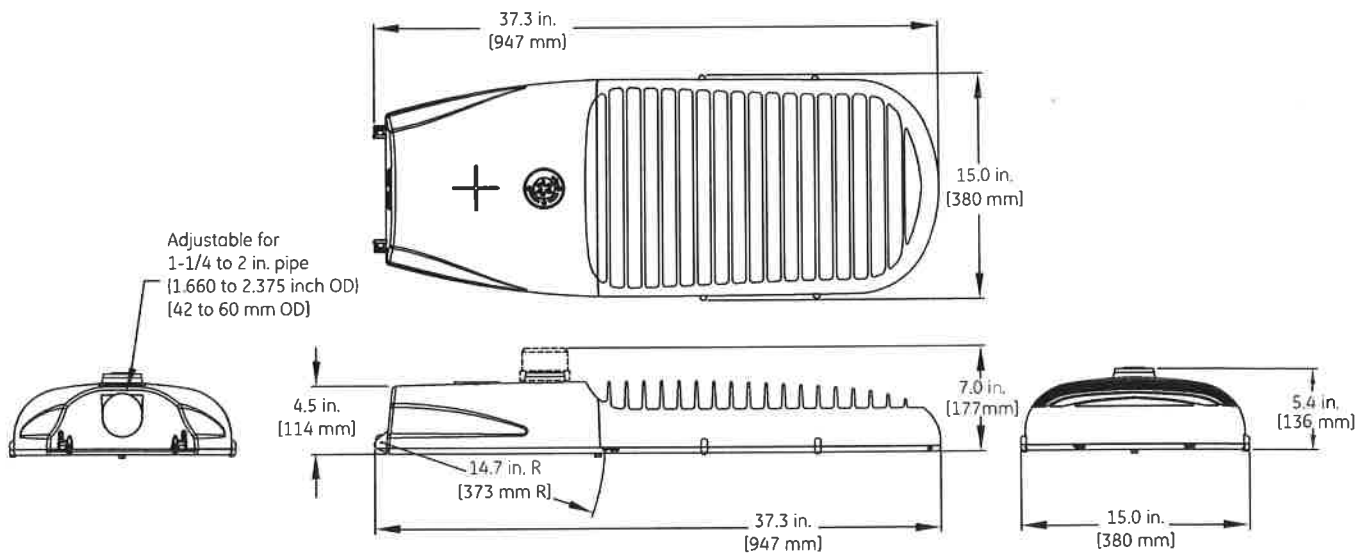
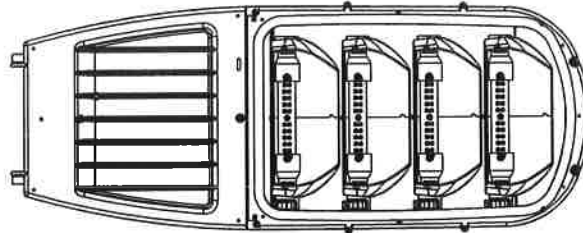
DATA	<ul style="list-style-type: none"> • Approximate Net Weight: 25 to 29 lbs. (11.34 to 13.15 kgs.) Contact manufacturer for specific configuration weight.
	<ul style="list-style-type: none"> • Effective Projected Area (EPA): 0.7 sq. ft. max (0.065 sq. m)

Product Dimensions

Scalable Cobrahead (ERS3)



Scalable Cobrahead (ERS4)



DATA	
	<ul style="list-style-type: none"> • Approximate Net Weight: 40 to 46 lbs. (18.14 to 20.87 kgs.) Contact manufacturer for specific configuration weight. • Effective Projected Area (EPA): 1.0 sq. ft. max (0.093 sq. m)



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1-888-69-43-533

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The Illuminating Company Streetlight Tariff Schedules. (Revised: 07-27-2017 DDD)

Municipality: Russell Township
 Account Number: 110024369420
 Cost Per kWh: \$ 0.0495

Note: Russell Township, CEI Legacy Streetlighting vs. Comparable LED Streetlighting. Pro-Forma Comparison --- For informational purposes only --- Rates and Riders are Based on July 2017 billing and are subject to change.

Description:

Removal of existing Illuminating Company Fixtures

Line No.	Quantity	Wattage	Description	Monthly Distribution Rate per Light	Total Monthly Distribution Rate	Monthly kWh per Light	Total Monthly kWh	Total Energy	Total	Data Check
54	6	100	Schedule 57 High Pressure Sodium Cobra Head	\$ 10.29	\$ 61.74	42	252	\$ 12.47	\$ 74.21	\$ 74.21
127	6	150	Schedule 57 High Pressure Sodium Cobra Head Long Term	\$ 10.95	\$ 65.70	62	372	\$ 18.41	\$ 84.11	\$ 84.11
53	19	175	Schedule 57 Mercury Vapor Cobra Head Long Term	\$ 7.39	\$ 140.41	69	1311	\$ 64.89	\$ 205.30	\$ 205.30
128	1	250	Schedule 57 High Pressure Sodium Cobra Head Long Term	\$ 13.19	\$ 13.19	105	105	\$ 5.20	\$ 18.39	\$ 18.39
3	8	250	Schedule 51 Mercury Vapor Cobra Head	\$ 8.80	\$ 70.40	104	832	\$ 41.18	\$ 111.58	\$ 111.58
5	3	400	Schedule 51 Mercury Vapor Cobra Head on Wood Pole	\$ 11.38	\$ 34.14	158	474	\$ 23.46	\$ 57.60	\$ 57.60
				\$ 385.58 Total		3,346 Total		\$ 165.63 Total		\$ 551.21

Installation LED Fixtures

Line No.	Quantity	Wattage	Description	Monthly Distribution Rate per Light	Total Monthly Distribution Rate	Monthly kWh per Light	Total Monthly kWh	Total Energy	Total	Data Check
153	6	50	Schedule 72 LED Cobra Head	\$ 7.39	\$ 44.34	18	108	\$ 5.35	\$ 49.69	\$ 49.69
154	6	90	Schedule 72 LED Cobra Head	\$ 9.24	\$ 55.44	32	192	\$ 9.50	\$ 64.94	\$ 64.94
153	19	50	Schedule 72 LED Cobra Head	\$ 7.39	\$ 140.41	18	342	\$ 16.93	\$ 157.34	\$ 157.34
154	1	90	Schedule 72 LED Cobra Head	\$ 9.24	\$ 9.24	32	32	\$ 1.58	\$ 10.82	\$ 10.82
154	8	90	Schedule 72 LED Cobra Head	\$ 9.24	\$ 73.92	32	256	\$ 12.67	\$ 86.59	\$ 86.59
156	3	260	Schedule 72 LED Cobra Head	\$ 15.13	\$ 45.39	91	273	\$ 13.51	\$ 58.90	\$ 58.90
				\$ 368.74 Total		1,203 Total		\$ 59.55 Total		\$ 428.29

Monthly Energy Savings (KWh) =	2143 kwh	Data Checks	2143	\$ 122.92
Monthly Cost Savings =	\$ 122.92	Monthly Savings	\$	\$
Conversion Cost/Fixture =	301	Annual Savings	\$	\$ 1,475
Total Conversion Cost	\$ 12,943			
Payback (in Years)	8.775			(8 Years, 9 Months)