



# Village of Irvington

## - Energy Savings Estimate, Project Cost & Financing Proposal

### Energy Savings Calculation

Based on the ConEd Westchester Streetlight Database that Village of Irvington provided, Lumen Light Solutions has performed an analysis for converting the entire streetlight system to Philips LED Roadway Luminaires.

Municipalities are billed by NYPA based on a production and delivery charge for Westchester Street Lighting under Service Classification 66.

Actual 2013 rate paid was 0.22491 per kilowatt.

Actual 2014 rate (effective March 2014) is 0.22961

2015 rates are expected to increase by 8% to approximately .25-cents per kilowatt, which will result in a rate of approximately 0.24798 per watt effective March 2015.

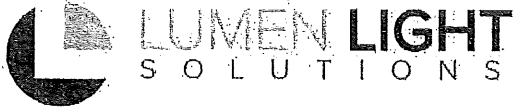
#### Village of Irvington

**Current:**

	ABH	Total in DB	KWH	2015 Energy Cost	Annual Cost
Existing System	4270	547	344,366.96	25-cents/watt	\$85,396.12

NEW	LED WATTS	ABH	QUANTITY	KWH	
RX1 32	36	4270	312	47,960.64	
RX1 48	78	4270	114	37,968.84	
RX1 64	103	4270	74	32,545.94	
RX2 128	205	4270	47	41,141.95	
			<b>547</b>	<b>159,616.87</b>	<b>\$39,581.79</b>
			<b>SAVINGS</b>	184,750 kwh	<b>\$45,814</b>

As the energy rate increases going forward so will the energy savings; however this proposal does not attempt to forecast the future price of energy nor the rate charged to municipalities by ConEd for delivery or NYPA for provision of energy. Therefore, the proposal is based on today's known rate.



## Cost of Project Calculation

The project cost for auditing the system and reviewing the developed replacement program with the Village, furnishing and installing the fixtures is based on the piggy-backing provision of the New Rochelle bid, and is shown in the table below:

<b>VILLAGE OF IRVINGTON</b>			
	Quantity	Unit Cost*	Total
HPS 100W equivalent = Philips RX1 32	312	357.85	111,649.20
HPS 150W equivalent = Philips RX1 48	114	388.35	44,271.90
HPS 250W equivalent = Philips RX1 64	74	431.05	31,897.70
HPS 400W equivalent = Philips RX2 128	47	601.85	28,286.95
Photocell	547	24.11	13,188.17
MPT (at identical \$16.79 per fixture rate)			9,184.13
<b>TOTAL PROJECT COST</b>			<b>\$238,478.05</b>

\* UNIT COST is from the New Rochelle Contract Bid pages BP-3 and BP-4

## Financing Proposal Summary Table

### Benefits of the Financing Option

1. **Not a penny is paid until all streetlights are installed.**
2. **Uses Energy Savings to Pay for the Conversion** – energy savings are accumulated –and will be realized– as each light is converted under Lumen’s approach.
3. **Finances off the City’s Balance Sheet – allowing bonding or borrowing capacity to be used for other capital improvements.** Using the NYS Energy Law financing is handled via a “lease” to the Village for the financing term and thus does not affect bonding or borrowing capacity.

Worth noting is that Lumen’s financing option compares favorably with NYPA financing when including all of NYPAs costs and performing a cost vs. benefit analysis.

<b>VILLAGE OF IRVINGTON</b>	5-year term	7-year term
<i>Kilowatt hour savings (annual)</i>	184,750 kwh	184,750 kwh
<i>At anticipated 2015 rate (.24798)</i>	\$45,814	\$45,814
<b>Annual Payment by City</b> to be paid annually for the financing term Commencing 30-days after substantial completion	\$54,000	\$41,000
Total Project Cost (Annual Pmt x Term)	\$270,000	\$287,000
<b>Available for City Use Each Year</b>	(8,186)	4,814

Interest rate is based on the bank cost of funds borrowing rates as of 8/11/14 as provided for in the New Rochelle bid documents.

# ECF EcoForm

## Site & Area

### Specifications

#### Housing

One piece die cast aluminum housing with integral arm and separate, self retained hinged, one piece die cast door frame.

#### IP Rating

LED light engine rated IP66.

#### Vibration Resistance

EcoForm with Standard Arm carries a 3G vibration rating that conforms to standards set forth by ANSI C136.31. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

#### Electrical

Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. Optional 0-10V dimming to 10% power. RoHS compliant. Surge protector standard. 10KA per ANSI/IEEE C62.41.2.

#### LED Board and Array

32, 48, or 64 LEDs. Color temperatures: 3000K, 4000K, 5700K +/- 250K. Minimum CRI of 70. Aluminum metal clad board. RoHS compliant.

#### LED Thermal Management

The housing design allows the one piece housing to provide excellent thermal management critical to long LED system life.

#### Energy Saving Benefits

System efficacy up to 95 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

#### LED Performance

Predicted Lumen Depreciation Data<sup>1</sup>

Ambient Temperature °C	Driver (mA)	Calculated L <sub>70</sub> Hours <sup>1,2</sup>	L <sub>70</sub> Per TM-21 <sup>2,3</sup>	Lumen Maintenance % @ 60,000 hours
Up to 40 °C	Up to 1050 mA	> 350,000 hours	> 60,000 hours	97%

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<sub>70</sub> is the predicted time when LED performance depreciates to 70% of initial lumen output.
3. Calculated per IESNA TM21-11. Published L<sub>70</sub> hours limited to 6 times actual LED test hours

#### Wireless Controls

The LimeLight wireless Controls System includes: gateway, controller pod (with wireless radio, motion response, and photocell), and commissioning/training. LimeLight is an intelligent web-based system that operates through a high density mesh (HDM) wireless technology. Wireless radios with motion response and photocell sensors are integrated with PureForm luminaires, and enable the fixtures to communicate via the ZigBee protocol. The gateway is a mini computer that connects to the Internet, and is located in a secure location. The central LimeLight database channels communication to and from the gateway, allowing data to be viewed or managed through the web-based graphical user interface (GUI). See LimeLight pages for details and technical information.

#### Motion Sensors

ECF-MR50, ECF-APD-MRO, ECF-MRI, ECF-APD-MRI luminaires may be specified for additional energy savings during unoccupied periods. See pages 4-6 for complete details.

#### Optical Systems

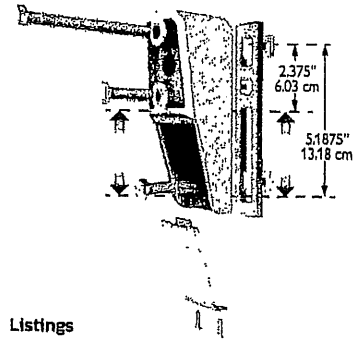
Type 2, 3, 4, and 5 distributions available. Internal Shield option mounts to LED optics and is available with Type 2, 3, and 4 distributions to control backlight.

#### Mounting

Standard luminaire arm mounts to 4" round poles. Square pole adapter included with every luminaire. Round Pole Adapter (RPA) required for 3-3.9" poles.

#### Retrofit Arm Mount

EcoForm features an innovative retrofit arm kit. When specified with the retrofit arm (RAM) option, EcoForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately.



#### Listings

ETL/cETL listed to the UL 1598 standard, suitable for Wet Locations. Suitable for use in ambients from -40° to 40°C (-40° to 104°F). The quality systems of this facility have been registered by UL to the ISO 9001 series standards. All EcoForm luminaires equipped with NW and CW are DesignLights Consortium® qualified.

#### Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. Standard colors include bronze (BRP), black (BLP), white (WP), and natural aluminum (NP). Consult factory for specs on optional or custom colors.

#### Warranty

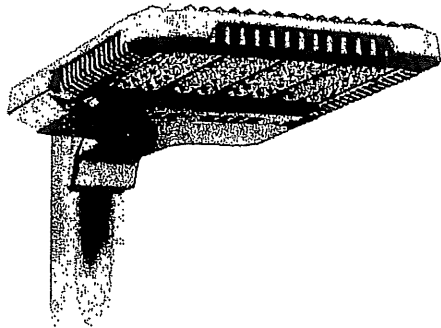
EcoForm luminaires feature a 5 year limited warranty. Philips Gardco LED luminaires with LED arrays feature a 5 year limited warranty covering the LED arrays. LED Drivers also carry a 5 year limited warranty. Motion sensors are covered by warranty for 5 years by the motion sensor manufacturer.

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Tel. 855-486-2216

Imported by: Philips Lighting,  
A division of Philips Electronics Ltd.  
281 Hillmount Rd, Markham, ON, Canada L6C 2S3  
Tel. 800-668-9008



Site & Area  
EcoForm

Project \_\_\_\_\_  
 Location \_\_\_\_\_  
 Cat No. \_\_\_\_\_  
 Type \_\_\_\_\_  
 Qty \_\_\_\_\_  
 Notes \_\_\_\_\_



EcoForm combines economy with performance in an LED area luminaire. Capable of delivering up to 20,000 lumens or more in a compact, low profile housing, EcoForm offers a new level of customer value. EcoForm features an innovative retrofit arm kit, simplifying site conversions to LED by eliminating the need to drill additional holes in most existing poles. Integral control systems, including motion response and wireless controls are available for further energy savings during off peak hours.

Ordering guide

example: ECF-APD-MRO-1-4-75LA-NW-120-NP-LF

Prefix	Controls	Mounting	Optics	LED Wattage	Color Temp	Voltage	Finish	Options
ECF		1	3	70LA-3270	LW	UNV	BRP	PCR - RAM
ECF EcoForm	Standard luminaire (leave blank) <b>DIM</b> 0-10V Dimming <b>APD</b> <sup>1</sup> Auto Profile Dimming <b>APD-MRO</b> <sup>2</sup> Auto Profile Dimming and Motion Response Override pole mounted motion sensor <b>APD-MRI</b> <sup>2,3</sup> APD with Motion Response Override luminaire sensor <b>MRI</b> <sup>2,3</sup> Motion Response at 50% low luminaire sensor <b>MR50</b> <sup>2</sup> Motion Response at 50% low, pole mounted sensor <b>LimeLight Wireless Controls</b> <b>LLC2</b> <sup>1,3</sup> #2 lens for 8-15' mounted heights <b>LLC3</b> <sup>1,3</sup> #3 lens for 15-25' mounted heights <b>LLC4</b> <sup>1,3</sup> #4 lens for 25-40' mounted heights	<b>1</b> Standard <b>2</b> 2@180 <b>2@90</b> 2@90 <b>3</b> 3@90 <b>3@120</b> 3@120 <b>3@120</b> 3@120 <b>4</b> 4@90 <b>WS</b> Wall mount including surface conduit rear entry permitted <b>MA</b> Mast Arm Filter (requires 2-3/8" O.D. Mast Arm)	<b>2</b> Type 2 <b>3</b> Type 3 <b>4</b> Type 4 <b>5</b> Type 5	530 mA <b>55LA-3253</b> <b>75LA-4853</b> <b>100LA-6453</b> 700mA <b>70LA-3270</b> <b>105LA-4870</b> <b>135LA-6470</b> 1050mA <b>105LA-321A</b> <b>160LA-481A</b> <b>215LA-641A</b>	<b>CW</b> Cool White 5700K 70CRI (nominal) <b>NW</b> Neutral White 4,000K 70CRI (nominal) <b>WW</b> <sup>4</sup> Warm White 3,000K 70CRI (nominal)	<b>120</b> 120V <b>208</b> 208V <b>240</b> 240V <b>277</b> 277V <b>347</b> 347V <b>480</b> 480V <b>UNV</b> 120-277V 50hz/60hz <b>HVU</b> 347-480V 50hz/60hz	<b>BRP</b> Bronze Paint <b>BLP</b> Black Paint <b>WP</b> White Paint <b>NP</b> Natural Paint <b>OC</b> Optional Color Specify optional color or RAL (ex: OC-LGP or OC-RAL7024) <b>SC</b> Special color Specify, must supply color chip. Requires factory quote.	<b>TL</b> Tool-Less entry and driver removal hardware <b>TB</b> <sup>3</sup> Terminal Block <b>IS</b> <sup>4</sup> Internal Shield <b>LF</b> <sup>7</sup> Line Fusing <b>LFC</b> <sup>7</sup> Line Fusing for Canada <b>PC</b> <sup>5,7,8</sup> Receptacle with Photocell (Includes PCRS) <b>PCB</b> <sup>5,7,8</sup> Photocell Button <b>PCRS</b> <sup>5,11</sup> Photocell Receptacle only with 2 dimming connections <b>PCR7</b> <sup>5,11</sup> Photocell Receptacle only with 2 dimming and 2 auxiliary connections <b>RAM</b> Retrofit Arm Mount Kit <b>PTF2</b> <sup>9</sup> Pole Top Filter for 2 3/8"-3" Tenon <b>PTF3</b> <sup>9</sup> Pole Top Filter for 3"-3 1/2" Tenon <b>PTF4</b> <sup>9</sup> Pole Top Filter for 3 1/2"-4" Tenon <b>RPA</b> <sup>10</sup> Round Pole Adapter for 3"-3.9" O.D. <b>BD</b> Bird Deterrent (field installed only)

- Available in 120V-277V Voltages only (UNV, 120, 208, 240 & 277).
- MR50 and APD-MRO luminaires require one motion sensor per pole, ordered separately. See page 2 for Accessories. Available in 120V or 277V only.
- ECF-MRI requires outboarded sensor when used with Terminal Block (TB) Option.
- Contact factory for lead times on warm white.
- LLC2/LLC3/LLC4 Wireless Controls are not configurable with PC/PCB/PCR5/PCR7 Options. See page 7-8 for more info.
- Not configurable with Type 5 (5) Optics.
- Not configurable with 120-277V (UNV) Voltage. Voltage must be specified.
- Not configurable with 480V (480) Voltage.
- Not configurable with 3@120 (3@120) Mounting.
- No adaptor required for 4" round poles. RPAs provided with Black Paint standard.
- Works with 3-pin or 5-pin NEMA photocell/dimming device.
- Works with 3-pin or 5-pin NEMA photocell/dimming device and auxiliary connections are not connected (for future use only).
- If ordered with DIM, APD, MRI, MR50, APD-MRI, APD-MRO, dimming will not be connected to NEMA receptacle.

# ECF EcoForm

## Site & Area

### EcoForm Accessories (order separately)

#### FS1R-100

MR hand held programmer

For use with 'MRI' motion response when field programming is required. If desired, only one is needed per job.

#### MS-A-120V

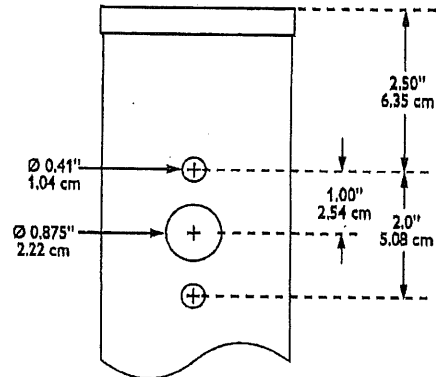
120V Input Area Motion Sensor  
For MR50 (Motion Response) or APD-MRO (Automatic Profile Dimming with Motion Response Override)

#### MS-A-277V

277V Input Area Motion Sensor  
For MR50 (Motion Response) or APD-MRO (Automatic Profile Dimming with Motion Response Override)

**Note:** Motion Sensors are ordered separately, with one (1) motion sensor required per pole location for MR50 or APD-MRO luminaires. See Luminaire Configuration Information on page 5 for more details. Area motion sensor color is Arctic White. MRI and APD-MRI luminaires include an integral motion sensor

### EcoForm Drill Template (standard arm mount)



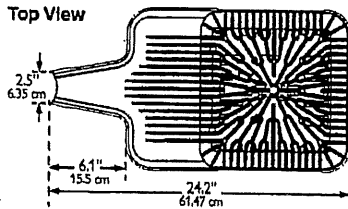
### LED Wattage and Lumen Values (standard EcoForm luminaire)

Order Code (standard units)	Array Quantity	Total LEDs	LED Current (mA)	Average System Watts <sup>1</sup>	LED Selection	Initial Lumens <sup>2</sup>			
						2 Type 2	3 Type 3	4 Type 4	5 Type 5
55LA-3253	2	32	530	52	NW	5,994 (s)	5,895 (s)	5,823 (s)	5,588 (s)
75LA-4853	3	48	530	77	NW	8,899 (s)	8,753 (s)	8,646 (s)	8,297 (s)
100LA-6453	4	64	530	103	NW	11,896 (s)	11,700	11,558	11,091
70LA-3270	2	32	700	69	NW	7,385 (s)	7,576 (s)	7,293 (s)	7,068 (s)
105LA-4870	3	48	700	104	NW	10,965 (s)	11,249 (s)	10,828 (s)	10,494 (s)
135LA-6470	4	64	700	139	NW	14,657 (s)	15,037	14,475 (s)	14,028
105LA-321A	2	32	1050	107	NW	10,199 (s)	10,458	10,072 (s)	9,767
160LA-481A	3	48	1050	158	NW	15,144 (s)	15,565	14,955 (s)	14,465
215LA-641A	4	64	1050	211	NW	20,243	20,252	19,991	19,880

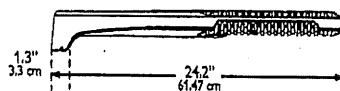
- System input wattage may vary based on Input voltage, by up to +/- 10%, and based on manufacturer forward voltage, by up to +/- 8%.
  - Lumen values based on photometric tests performed in compliance with IESNA LM-79.
- (s). Data is scaled based on tests of similar, but not identical, luminaires.

### Dimensions – Standard EcoForm luminaire

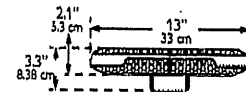
#### Top View



#### Side View



#### End View



#### EPA (ft<sup>2</sup>/m<sup>2</sup>)

Single	Twin (2@180)	3/4@90
0.2 / 0.019	0.5 / 0.046	0.5 / 0.046

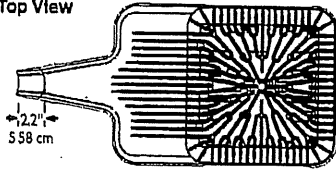
Approximate Luminaire Weight:  
20 Lbs (9.07 Kg)

# ECF EcoForm

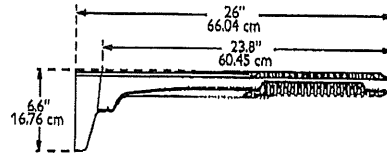
## Site & Area

### Dimensions – EcoForm with Retrofit Arm Mount (RAM) \*

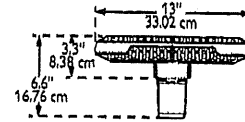
Top View



Side View



End View



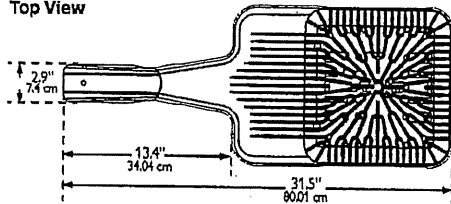
EPA (ft<sup>2</sup>/m<sup>2</sup>)

Single	Twin (2@180)	3/4@90
0.3 / 0.028	0.6 / 0.056	0.7 / 0.065

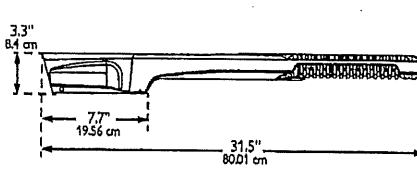
Approximate Luminaire Weight:  
21 Lbs (9.53 Kg)

### Dimensions – EcoForm with Mast Arm Fitter (MA)

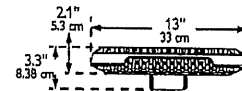
Top View



Side View



End View



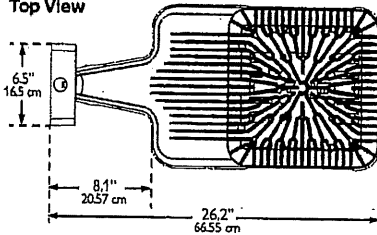
EPA (ft<sup>2</sup>/m<sup>2</sup>)

Single
0.51 / 0.047

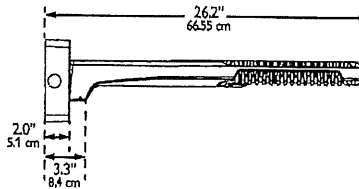
Approximate Luminaire Weight:  
21.5 Lbs (9.77 Kg)

### Dimensions – EcoForm with Wall Mount (WS)

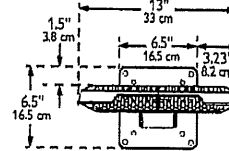
Top View



Side View



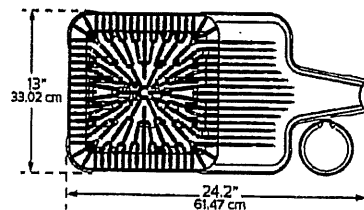
End View



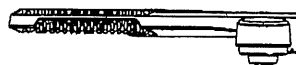
Approximate Luminaire Weight:  
23.36 Lbs (10.6 Kg)

### Dimensions – EcoForm with LimeLight Luminaire mounted controller

Top View



Side View



End View

