GENERAL SERVICES DEPARTMENT MEMORANDUM

EXECUTIVE SUMMARY

TO: **Doug Bradshaw, Senior Projects Manager**

FROM: **Annalise Mannix, P.E. Manager of Environmental Programs**

DATE: **August 9, 2010**

RE: **Sustainability Advisory Board Recommending the City Commission request the FDOT approve or install LED lighting improvements in Key West**

ACTION STATEMENT: A RESOLUTION OF THE CITY OF KEY WEST REQUESTING THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) TO USE LIGHT EMITTING DIODE (LED) LIGHTING ON THE NORTH ROOSEVELT BOULEVARD RECONSTRUCTION PROJECT AND AUTHORIZE LED LIGHTING ON THE SOUTH ROOSEVLET BOULVARD RECONSTRUCTION PROJECT; AND DIRECTING STAFF TO CREATE A LED PILOT PROJECT ON PINE AND OLIVIA STREET.

STRATIGIC PLAN INITIATIVE
Environmental management seeking to preserve, maintain and when possible enhance the physical environment of Key West and its nearshore waters and is a strategic plan initiative. The work of the Sustainability Advisory Board (SAB) helps to preserve, maintain and when possible enhance the physical environment of Key West.

BACKGROUND:
The City of Key West recognized that local government plays a vital role in fostering sustainability therefore Commission created a Sustainability Advisory Board of the City of Key West with the mission to promote the sustainability of the community as a whole, with the definition of "Sustainability" defined as meeting the vital human needs of the present without compromising the ability to meet future needs. **The SAB recommends the above resolution in an effort to promote the sustainability of the community by reducing greenhouse gas emissions and reducing costs.** Street lighting accounted for 13.5% of the Key West government emissions in FY2005.

PURPOSE & JUSTIFICATION:
City of Key West City Commission resolved to reduce greenhouse gas emissions by 15% by 2015 based on a 2005 baseline survey. Light emitting diode (LED) lighting uses up to 60% less energy than standard street lighting, is in use on various state and local government roads and is a cost effective way to significantly reduce maintenance costs and energy use for lighting and therefore help to reduce greenhouse gas emissions. The City of Key West Climate Action Plan recommends the use of LED

street lighting. **The SAB recommends the initial use of LED lighting on the FDOT roads (large roads) and as a pilot project on Pine and Olivia Streets.**

The City of Key West currently pays for all FDOT street lighting on North and South Roosevelt Boulevards, and may have to pay the lighting bill for additional street lighting on FDOT roads when they are re-constructed in the coming years. Regardless, the City will have to accept the carbon emissions increase in its greenhouse gas emissions inventory. This means that it will be hard for the City to meets its reduction goals while increasing the lighting electric use in the City. Currently, the City pays an average of $16,733 per month for the standard cobra head lighting listed below, which *averages* to $7.42 per month per fixture. This is expected to rise by 64% when the new tariff begins to an *average* of $12.34 per month per fixture. LED lighting will only cost an *average* of $10.6 per month per fixture in the new tariff.

Summary of Lights Paid for by Key West

Owner	Size & type	Qty REG	Qty Cutoff	
City KW	100 watt sodium vapor	624	516	
	200 watt sodium (6 are FDOT lights)	385	329	
	400 watt sodium (all FDOT lights)	55	46	
	400 mercury vapor	5		
	175 mercury vapor	275		**Total**
		1344	891	**2235**

FDOT staff contacted in Tallahassee (Chester A. Henson, P.E. State Traffic Standards Engineer Florida Dept. of Transportation) suggested the option of a pilot project to install LED lighting on their roads. The number of FDOT lights, as well as City lights that the city pays for is listed above. The City Commission or Mayor would have to make a request from the North Roosevelt Blvd Project Manager, or District 6 Administrator to use LED technology. [Staff recommends this letter be written quickly as design is winding down.]

On South Roosevelt Blvd. the City of Key West has full control of the lighting design requirements (as long as it meets FDOT standards) and the City Commission would have to direct City staff to use LED light fixtures since they are currently designed for non-LED. **The SAB recommends to the Commission that staff change the proposed South Roosevelt Blvd. lighting to LED.** [A staff note: it is recommended that these lights be an approved turtle friendly lights so the lights do not have to be turned off during season].

The SAB also recommends that the City install a pilot project on Pine and Olivia Streets to test LED lighting in Key West. The Lighting Task Force of the Pedestrian Action Committee has been working with staff from the City and Keys Energy to create

a program that installs LED lights to provide better illumination for walking and driving while reducing costs. A full description of the SAB proposed program is attached, however, it is basically a plan to replace 25 or more cobra head lights in the Meadows with 34 watt LED's. The resultant GHG emission reduction is 5.6 tons of CO2e. The City, KES and the Lighting Task Force tested many lights on Flagler Ave and in the Meadows. They sought homeowners input on the lights installed to ensure the users enjoy the new lighting. Key Energy has agreed to negotiate a pilot program with the City as soon as the City executes the recurring street light tariff contract. KES will make the capital investment for this project, and the monthly light cost to the city will be reduced.

LED lighting intensity can be modified as needed for different size streets. In addition, a computer software package can be purchased to modify light intensity at will, i.e. certain hours of the night with lower intensity at say 3-5 AM or on side streets and higher intensity when there is significant traffic or an event. Tools can be used to have police dispatch personnel flash lights close to a called in complaint to assist an ambulance find a home in an emergency, or it can turn up light intensity in locations a of a called in complaint (I.e. a resident calls complaining of an intruder) or ongoing police incident. These tools are not included in the cost estimates for this analysis, nor are they desired for this project.

OPTIONS:
Approve the resolution as provided, and save money and carbon emissions.

Modify the resolution to limit one or more of the three projects and approve it as desired.

Do not provide any resolution.

[Staff Note: Since LED's are less expensive on a monthly basis and reduce GHG emissions, it is recommended that the Commission create an ordinance that requires all future new installation of street lights be LED if the pilot program is successful.]

FINANCIAL IMPACT:
The City will have positive impacts for the FDOT street lighting through saved operation and maintenance costs over the life cycle of lights. Keys Energy Services installs and maintains all the City street lights and maintains the FDOT street lights. The City pays the fees for both. Keys Energy Services developed a Street Light Financial Evaluation (attached) for the 25 light pilot project and has determined that the cost savings for replacement of an existing 100 watt light over 13 years will result in a cost savings of $4,212 dollars, and have a 11.7 year payback period over existing cobra head light fixtures.

According to KES, the current estimated annual cobra head lighting cost for 2010 is expected to be $200, 807. The billing in 2011 is expected to rise to $329,356 when the new 2011 KES rate tariffs are approved. Additional street lighting costs for "historic" style street lights are billed separately. It is expected that the City will change to LED technology for "historic" lights one day. The HARC Planner has selected an appropriate

fixture head that is designed specifically for LED lighting and meets City engineering safety requirements.

The lighting fee above also has an additional monthly power cost adjustment rate [PCA] which is charged (or credited) based on the rate and the number of kilowatt hours (kWh). The PCA rate has been negative for the past several months, resulting in a credit; however, it is expected to again increase. Keys Energy Services has proposed the following Tariffs for this service; clearly, LED lights are the best option:

Keys Energy Services Tariff		**Proposed SL Rate**			**Current SL Rate**	
Type	**Wattage**	**Flat Monthly Fee**	**Monthly kWh**		**Flat Monthly Fee**	**Monthly kWh**
Sodium Vapor	100 Watt	$ 11.13	33		$ 6.69	47
Sodium Vapor	100 Watt Cobra	$ 10.99	33		$ 6.80	47
Sodium Vapor	200 Watt Cobra	$ 14.15	67		$ 9.25	83
Sodium Vapor	400 Watt	$ 19.68	134		$ 14.33	153
Mercury Vapor	175 Watt	$ 13.21	59		$ 8.35	73
Mercury Vapor	400 Watt	$ 19.74	134		$ 14.33	153
Cut Off Optic	100 Watt	$ 11.15	33		$ 6.69	47
Cut Off Optic	200 Watt	$ 14.05	67		$ 9.12	83
LED	34 Watt	$ 10.07	11		NA	NA
LED	46 Watt	$ 10.39	15		NA	NA
LED	61 Watt	$ 10.79	20		NA	NA

RECOMMENDATION:
Approve this resolution.

Resolution No. 2010-04

A RESOLUTION OF THE CITY OF KEY WEST "SUSTAINABILITY ADVISORY BOARD" RECOMMENDING THE CITY REQUEST THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) TO USE LIGHT EMITTING DIODE (LED) LIGHTING ON THE NORTH ROOSEVELT BOULEVARD RECONSTRUCTION PROJECT

WHEREAS, the City of Key West recognizes that local government plays a vital role in fostering sustainability; and

WHEREAS, the City of Key West created a Sustainability Advisory Board of the City of Key West; and

WHEREAS, the Definition of "Sustainability" is defined as meeting the vital human needs of the present without compromising the ability to meet future needs; and

WHEREAS, the City of Key West City Commission resolved to reduce greenhouse gas emissions by 15% by 2015 based on a 2005 baseline survey; and

WHEREAS, light emitting diode (led) lighting uses up to 60% less energy than standard street lighting, is in use on various state and local government roads and is a cost effective way to significantly reduce maintenance costs and energy use for lighting and therefore help to reduce greenhouse gas emissions; and

WHEREAS, the Key West Climate Action Plan recommends the use of LED street lighting and;

WHEREAS, the City of Key West will have to pay the lighting bill for street lighting on FDOT roads and accept the carbon emissions increase in its inventory;

NOW, THEREFORE, BE IT RESOLVED BY THE SUSTAINABILITY ADVISORY BOARD OF THE CITY OF KEY WEST, FLORIDA, AS FOLLOWS:

The Board recommends that the City Commission:

a) request the FDOT District Six office to specify LED lighting as the method of providing street lighting for North Roosevelt Boulevard; and
b) request the FDOT approve a LED and solar LED street light be approved for use on state roads (like South Roosevelt Boulevard); and
c) initiate an LED lighting pilot project on Pine Street and Olivia Street.

Passed and adopted by the Sustainability Board at a meeting held this 6th day of May, 2010.

Authenticated by the presiding officer and Secretary of the Board on 5/3, 2010.

Filed with the Clerk ~~May~~ June 8, 2010

Dr. Ross Williams, Chairman

Attest

Jaime Baker, Board Secretary

Project Plan
Meadows Area Street Lighting

This project has been being worked on for over a year with input from Lighting Task Force, Keys Energy Services and the City Environmental Programs. We have tested over 6 LED light fixtures on Flagler Ave, and in the Meadows seeking input from the community on the quality of the light output and design features.

This plan is designed to introduce the City of Key West to the technology of LED street lighting. Studies indicate that LED lights have a lower life cycle cost than other street light technologies due to the long life of the LED's and the low electric use. This reduces maintenance and operating cost.

LED lighting in general has better color imaging; under these lights one seen natural daylight colors. LED lights can be turned up or down; diming during certain hours, say 5 to 7 am, and LED lights can be brightened, within reason, as necessary.

Environmental Programs selected the Meadows location since it is purely residential and has very limited traffic. Since the streets are small it is a perfect opportunity to install lights that can be adjusted and dimmed to meet the needs of small streets, similar to some old town areas, and there are a few blocks that also have larger rights of way that still allow for a good test site for wider blocks. The location of the lights would be designed to minimize the number of lights, have uniformity of light fixture height and improve the quality of the light on the road and sidewalk.

Keys Energy Services developed a financial evaluation of the lights and found that if 25 LED lights were installed to replace 25 existing 100 high pressure sodium lights the annual energy saving would be $594, and the 13 year life cycle cost a savings would be $7,722. However, as we design the lights for one full neighborhood based on actual light standards on the ground we may be able to reduce the total number of fixtures and save additional funds.

For this project Keys Energy Services would purchase the light, install them and maintain them. The City would pay a monthly bill as it does now for street lighting which will cover the cost of all of the above, the new cost will be $1.06 less than the existing 100 watt cobra head lights. The total cost of the project would be $25,860 and when including purchase and O&M it would have an 11.7 year pay back period over maintaining the existing lights.

The attached sheets include information on one LED product that we tested and believe to be an excellent product, the KES financial analysis, and the photometric print out of the meadows area, with a summary of how many foot-candles of light would be actually seen on the street in different areas of the meadows. The photometric summary determines that 30 lights would provide for an entire neighborhood change out, however, our initial project was for only 25 lights so that is what we continue to request.

Street Light Financial Evaluation

Pay Back Period Calculation

100-HPS ---- 34-LED

HPS 100w CO Street Light	
Watts per Fixture with Ballast **100w Street**	120
Fixture Cost per unit with overhead	$257.00
# of Fixtures	25
Install cost (Fixture cost +labor/truck cost w/oh)	$11,260.00
Total kWh per Month	33.4
Cost of Energy per KWH	$0.090
Energy Cost to operate fixture (per yr)	$36.07
Maintenance Bulb (for 1 fixture for 1 yr)	$26.04
Maintenance Bulb (per yr for total qty)	$651.00
Total COST(O&M and ENERGY) per yr	$1,552.80
Total 13yr Life cycle cost	$31,446.40
(includes Light, initial install, energy and OM over the 13yrs)	

LED 34w Street Light	
Watts per Fixture	34
Fixture Cost per unit	$841.00
# of Fixtures	25
Install cost (Fixture cost +labor/truck cost)	$25,860.00
Total kWh per Month	11.4
Cost of energy per KWH	$0.090
Energy Cost to operate fixture (per yr)	$12.31
Maintenance (for 1 fixture for 1 yr)	$0.00
Maintenance (per yr for total qty)	$0.00
Total COST(O&M and ENERGY) per yr	$307.80
Total 13yr Life cycle cost	$29,861.40
(includes initial light, install, energy and OM over the 13yrs)	

SUMMARY	
Total Energy savings with LED per yr	***$594.00***
Total Energy Savings with LED over the 13 Years	***$7,722.00***
Initial install Cost LED (material/labor/truck)	***$25,860.00***
Initial install Cost HPS	***$11,260.00***
PP (Payback period) -- In Years	***11.7***

KEYS Info/Comments

Developed by Dale Finigan
KEYS Energy
7/29/2010

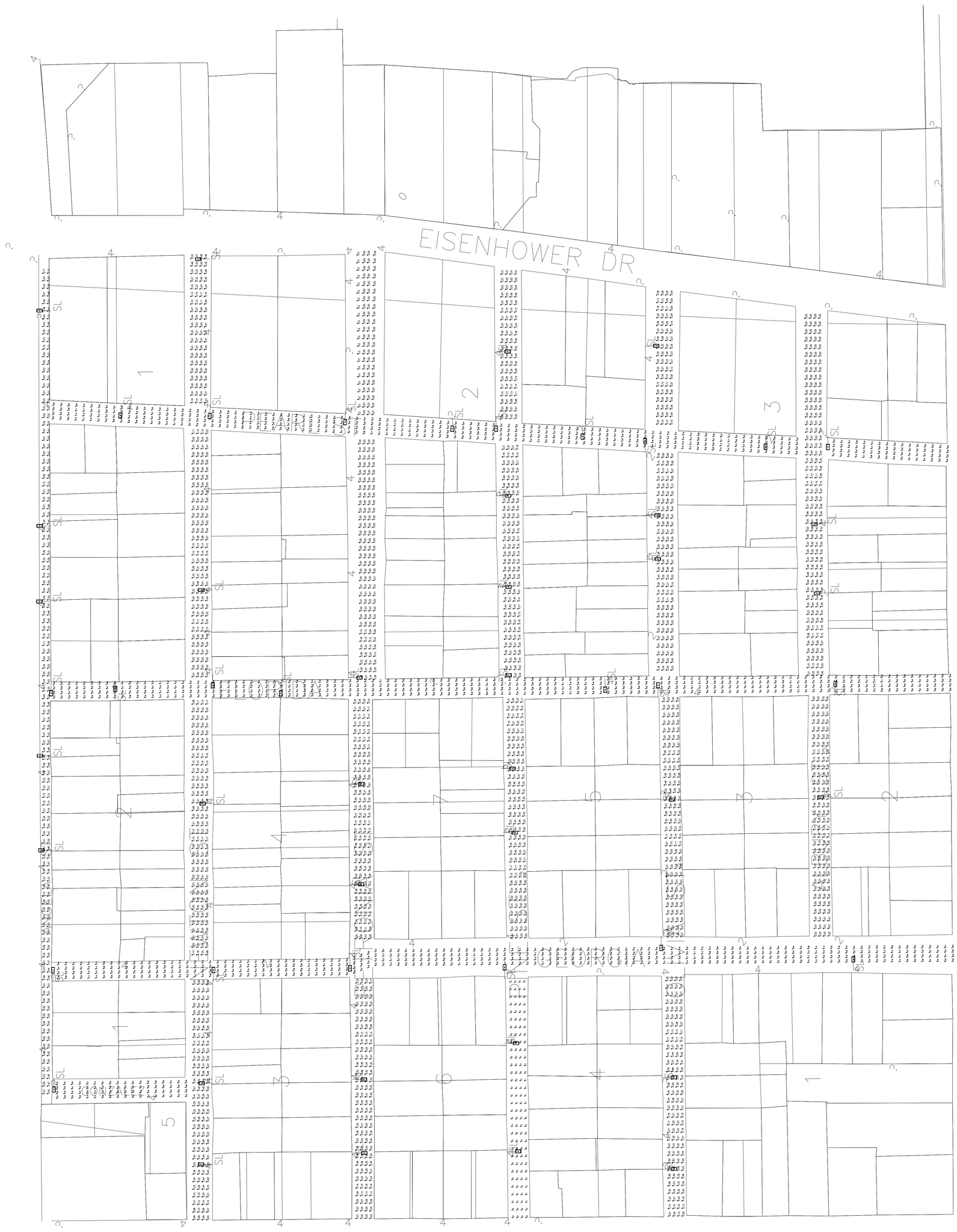
Notes--Calculations/assumptions

Energy cost same over test period
Assumed 6 yr life on HPS bulb
Manufacture LED life span is 13yrs
Assumed ballast is 10yr life on HPS
photocell not included, as same for both in RIO calculations

KEYS energy services

Luminaire Schedule						
Project: MEADOWS STREET LIGHTING KEY WEST, FL 5-17-2010						
Symbol	Qty	Label	Description	Lumens/Lamp	LLF	Lum. Watts
	55	SL	BETA STR-LWY-2MB-AA-04-C-UL-WH -350mA -43K -2' - 0" ARM POLE MOUNT: 23' - 0" AFG	1772	0.890	37

Calculation Summary					
Project: MEADOWS STREET LIGHTING KEY WEST, FL 5-17-2010 LIGHT LEVELS AT 50,000 HOURS OF OPERATION					
Label	Avg	Max	Min	Avg/Min	Max/Min
ALBURY	0.19	0.57	0.00	N.A.	N.A.
ANGELA	0.24	0.54	0.00	N.A.	N.A.
FLORIDA	0.25	0.68	0.00	N.A.	N.A.
GEORGIA	0.17	0.52	0.00	N.A.	N.A.
GONZALEZ	0.13	0.52	0.00	N.A.	N.A.
NEWTON	0.18	0.54	0.00	N.A.	N.A.
OLIVIA	0.23	0.73	0.00	N.A.	N.A.
PEARL	0.30	0.82	0.00	N.A.	N.A.
PETRONIA	0.18	0.54	0.00	N.A.	N.A.
PINE	0.29	0.63	0.00	N.A.	N.A.



Luminaire Schedule

Project: MEADOWS STREET LIGHTING KEY WEST, FL 5-17-2010

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Calculation Summary

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LIGHT LEVELS AT 50,000 HOURS OF OPERATION

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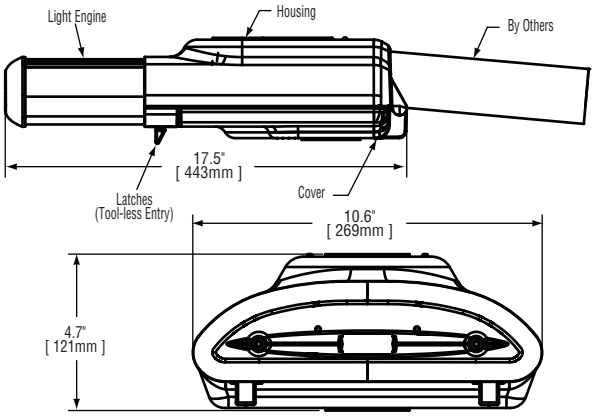
GONZALEZ	0.13	0.52	0.00	N.A.	N.A.
NEWTON	0.18	0.54	0.00	N.A.	N.A.
OLIVA	0.23	0.73	0.00	N.A.	N.A.
PEARL	0.30	0.82	0.00	N.A.	N.A.
PETRONIA	0.18	0.54	0.00	N.A.	N.A.
PINE	0.29	0.63	0.00	N.A.	N.A.

STR-LWY-2M-HT LEDway™ Streetlight – Type II Medium

Rev. Date: 02/15/10



Notes:

Product	Family	Optic	Mounting	# of LEDs (x 10)	LED Series	Voltage	Color Options
STR	LWY	2M[1] 2MB[2]	HT[3]	02 03	C	UL Universal 120–277V UH Universal 347–480V	SV Silver[4] BK Black[4] BZ Bronze[4] PB Platinum Bronze[4] WH White[4]

Factory-Installed Options

Please type additional options in manually on the lines provided above.

- **350** 350mA Drive Current[5]
- **43K** 4300K Color Temperature[6]
- **700** 700mA Drive Current[7]
- **DIM** 0–10V Dimming[8,9]
- **F** Fuse[10]
- **HL** Hi/Low (175/350/525, dual circuit input)[11-13]
- **N** No Quick Disconnect Harness or Leveling Bubble[14]
- **PD** Power Door[15,16]
- **R** NEMA Photocell Receptacle[10]
- **SC** Door Safety Tether[17]

Click here for Utility option.

For additional options, see IP66 spec sheet.

Footnotes

1. IESNA Type II Medium distribution
2. IESNA Type II Medium distribution with backlight control
3. Horizontal tenon mount
4. Light engine portion of extrusion is not painted and will remain natural aluminum regardless of color selection
5. Driver operates at 350mA instead of the standard 525mA providing a lower lumen output and a longer life
6. Color temperature per fixture; minimum 70 CRI
7. Driver operates at 700mA instead of the standard 525mA providing a higher lumen output and a shorter life
8. Control by others
9. Please consult factory for availability
10. Not available with HL option when UH voltage is selected
11. Not available when UH voltage is selected
12. Refer to multi level spec sheet for more information
13. Sensor not included
14. Standard product features unless N option is specified; door clips not included
15. All connections between door and fixture are shipped unconnected from the factory; door release spring included to open door automatically when the latches are released
16. Hinge retaining clips not included as part of this option
17. Stainless steel aircraft cable

LED PERFORMANCE SPECS

# of LEDs	Initial Delivered Lumens – Type II Medium @ 6000K	B	U	G	Rating***	Initial Delivered Lumens – Type II Medium w/ Backlight Control @ 6000K	B	U	G	Rating***	Initial Delivered Lumens – Type II Medium @ 4300K	B	U	G	Rating***	Initial Delivered Lumens – Type II Medium w/ Backlight Control @ 4300K	B	U	G	Rating***	System Watts 120–277V	Total Current @ 120V	Total Current @ 230V	Total Current @ 277V	System Watts 347–480V*	Total Current @ 347V	Total Current @ 480V	L_{70} Hours** @ 25° C (77° F)
350mA Fixture Operating at 25° C (77° F)																												
20	1,803 (02)	1	1	1		1,347 (02)	0	1	1		1,582 (02)	1	1	1		1,181 (02)	0	1	1		26	0.22	0.14	0.16	32	0.10	0.13	163,000
30	2,705 (03)	1	1	1		2,020 (03)	0	1	1		2,372 (03)	1	1	1		1,772 (03)	0	1	1		37	0.31	0.18	0.17	43	0.13	0.15	150,000
525mA (Standard) Fixture Operating at 25° C (77° F)																												
20	2,416 (02)	1	1	1		1,805 (02)	0	1	1		2,119 (02)	1	1	1		1,583 (02)	0	1	1		39	0.32	0.19	0.17	44	0.13	0.15	107,000
30	3,624 (03)	1	1	1		2,707 (03)	0	1	1		3,179 (03)	1	1	1		2,375 (03)	0	1	1		55	0.46	0.26	0.22	61	0.18	0.17	92,000
700mA Fixture Operating at 25° C (77° F)																												
20	2,957 (02)	1	1	1		2,209 (02)	0	1	1		2,594 (02)	1	1	1		1,937 (02)	0	1	1		54	0.45	0.25	0.22	59	0.17	0.17	73,000
30	4,436 (03)	1	1	1		3,313 (03)	1	1	1		3,891 (03)	1	1	1		2,906 (03)	0	1	1		77	0.65	0.35	0.30	83	0.24	0.21	61,000

* Utilizes magnetic step-down transformer

** For recommended lumen depreciation data see TD-13

*** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit www.iesna.org/PDF/Erratas/TM-15-07BugRatingsAddendum.pdf

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Made in the U.S.A. of U.S. and imported parts.
Meets Buy American requirements within the ARRA.

STR-LWY-2M-HT LEDway™ Streetlight – Type II Medium

Rev. Date: 02/15/10

General Description

Fixture housing is all aluminum construction. Standard fixture utilizes terminal block for power input suitable for #2–#14 AWG wire and operates at 525mA. Drive current is field switchable on 20 and 30 LED units. Fixture is designed to mount on 1.25" IP (1.675" O.D.) and/or 2" IP (2.375" O.D.) horizontal tenon and is adjustable +/- 5º to allow for fixture leveling (includes leveling bubble to aid in this process). Fixture carries a limited five year warranty.

Electrical

Modular design accommodates varied lighting output from high power, white, 6000K (+/- 500K per full fixture), minimum 70 CRI, long life LED sources. 120–277V 50/60 Hz, Class 1 LED drivers are standard. 347–480V 50/60 Hz option is available. LED drivers have power factor >90% and THD <20% at full load. Units provided with integral 9kV surge suppression protection standard. Quick disconnect harness suitable for mate and break under load provided on power feed to driver for ease of maintenance. Surge protection tested in accordance with IEEE C62.41.2 and ANSI standard 62.41.2.

Finish

Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable silver powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Bronze, black, white and platinum bronze powder topcoats are also available. The finish is covered by our 10 year limited warranty.

Fixture and finish are endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117.

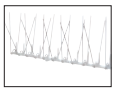
Testing & Compliance

UL listed in the U.S. and Canada for wet locations. Consult factory for CE Certified products. RoHS compliant. Meets CALTrans 611 Vibration Testing and GR-63-CORE Section 4.4.1/5.4.2 Earthquake Zone 4. International Dark-Sky Association approved.

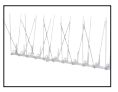
Patents

U.S. and international patents granted and pending. BetaLED is a division of Ruud Lighting, Inc. For a listing of Ruud Lighting, Inc. patents, visit www.uspto.gov.

Field-Installed Accessories

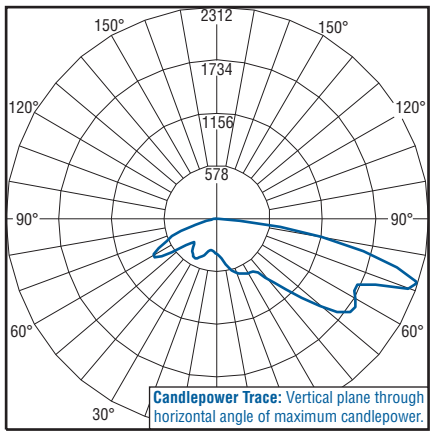


Bird Spikes for Light Engine
XA-BRDSPK30

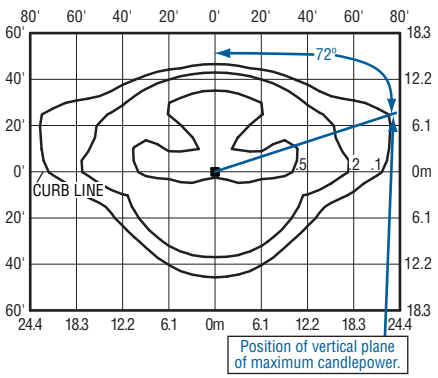


Bird Spikes Kit for Housing
XA-BRDSPKHSG

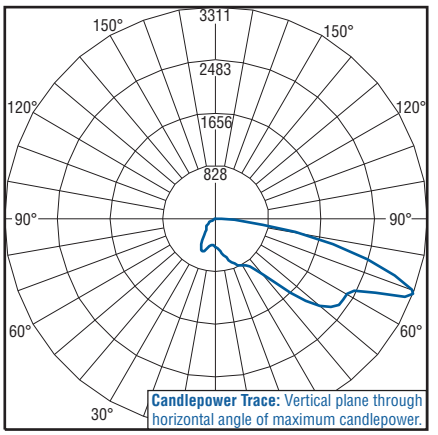
Photometrics



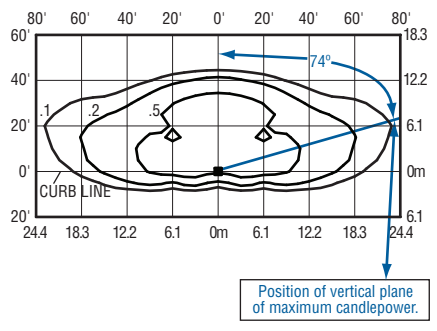
Independent Testing Laboratories certified test. Report No. ITL63655. Candlepower trace of 6000K, 30 LED Type II Medium streetlight luminaire with 3,604 initial delivered lumens operating at 525mA. **All published luminaire photometric testing performed to IESNA LM-79-08 standards.**



Isofootcandle plot of 6000K, 30 LED Type II Medium streetlight luminaire at 25' A.F.G. Luminaire with 3,624 initial delivered lumens operating at 525mA. Initial FC at grade.



Independent Testing Laboratories certified test. Report No. ITL63996. Candlepower trace of 6000K, 40 LED Type II Medium streetlight luminaire with backlight control and 3,534 initial delivered lumens operating at 525mA. **All published luminaire photometric testing performed to IESNA LM-79-08 standards.**



Isofootcandle plot of 6000K, 30 LED Type II Medium streetlight luminaire with backlight control at 25' A.F.G. Luminaire with 2,707 initial delivered lumens operating at 525mA. Initial FC at grade.

LEDway™ EPA & Weight Calculations

		Approximate Weight 120–277V*
20–30 LED fixture		10.5 lbs.
		EPA
Horizontal Tenon Mount		
1 fixture		0.565
		EPA
Round External Mount / Square Internal Mount Horizontal Tenons with Fixture(s)		
PT/PD-1H	Single	0.785
PT/PD-2H(90)	90º Twin	1.019
PT/PD-2H(180)	180º Twin	1.350
PT/PD-3H(90)	90º Triple	1.534
PT/PD-3H(120)	120º Triple	1.383
PT/PD-4H(90)	90º Quad	1.938

*Add 5 lbs. for transformer in 347–480V fixtures

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Made in the U.S.A. of U.S. and imported parts.
Meets Buy American requirements within the ARRA.

	Qty Per City	Per July Billing	Difference
100 watt SV	685	624	61
100 watt SV cut off	425	516	(91)
100 watt SV cobra	-	-	-
200 watt SV	416	385	31
200 watt SV cut off	300	329	(29)
200 watt SV cobra	-	-	-
250 watt MV	-	7	(7)
400 watt SV	65	55	10
400 watt MV	6	5	1
400 watt SV cut off	-	46	(46)
175 watt MV	275	257	18
	2,172	2,224	(52)

Type	Current SL Rate				Proposed SL Rate				
	Qty	Flat Monthly Fee	Monthly kWh	Billing Assume (0.0078) PCA	Qty	Flat Monthly Fee	Monthly kWh	Billing Assume (0.0078) PCA	Difference
100 watt SV	624	$ 6.69	47	$ 3,945.80	594	$ 11.13	33	$ 6,456.62	$ 2,510.82
100 watt SV cut off	516	$ 6.69	47	3,262.87	516	$ 11.15	33	5,619.86	2,356.99
100 watt SV cobra	-	$ 6.80	47	-	-	$ 10.99	33	-	
200 watt SV	385	$ 9.25	93	3,281.97	385	$ 14.15	67	5,244.85	1,962.88
200 watt SV cut off	329	$ 9.12	83	2,787.49	329	$ 14.05	67	4,451.58	1,664.09
200 watt SV cobra	-	$ 9.25	93	-	-	$ 14.15	67	-	-
250 watt MV	7	$ 9.86	98	63.67	7	$ 17.69	84	119.24	55.57
400 watt SV	55	$ 14.33	153	722.51	55	$ 19.68	134	1,025.14	302.62
400 watt MV	5	$ 14.33	153	65.68	5	$ 19.74	134	93.47	27.79
400 watt SV cut off	46	$ 14.33	153	604.28	46	$ 19.74	134	859.96	255.68
175 watt MV	257	$ 8.35	73	1,999.61	257	$ 13.21	59	3,276.09	1,276.47
34 watt LED				-	30	$ 10.07	11	299.54	299.54
46 watt LED				-		$ 10.39	15	-	-
61 watt LED				-		$ 10.79	20	-	-
	2,224		Monthly	$ 16,733.90	2224		Monthly	$ 27,446.35	$ 10,712.45
			Annual	$200,806.74			Annual	$329,356.19	$128,549.45

UTILITY BOARD OF THE CITY OF KEY WEST, FLORIDA
Development of Lighting Rates

2011				Sodium Vapor Fixtures 100 Watt		
Monthly kWh				33.4		33.4
				w/o OH		***w/OH***
Initial Cost						
Lamp				$ 7.29		
Luminaire				103.31		
Photo Cell				4.02		
Wire, Bolts, etc.				1.70		
Arm and Foot				62.11		
Total Fixture Cost			10	178.43		
Monthly Cost				1.49	1.4396	$ 2.14
	# hr.	***$/hr.***	***Yrs***			
Labor - Lineman	1	$ 33.68		0.28	2.0296	0.57
Labor Apprentice	1	$ 27.13		0.23	2.0296	0.46
Truck	1	$ 60.00		0.50	1.1800	0.59
Total Installation Costs				1.01		1.62
Total Monthly Initial Costs				2.49		3.76
O&M						
Lamp			6	0.10	1.4396	0.15
Labor - Lineman	0.75	33.68	6	0.35	2.0296	0.71
Labor - Apprentice	0.75	27.13	6	0.28	2.0296	0.57
Truck	0.75	60.00	6	0.63	1.1800	0.74
				1.36		2.17
Photo Cell			5	0.07	1.4396	0.10
Labor - Lineman	0.75	33.68	5	0.42	2.0296	0.85
Labor - Apprentice	0.75	27.13	5	0.34	2.0296	0.69
Truck	0.75	60.00	5	0.75	1.1800	0.89
				1.58		2.52
Monthly Replacement Costs				2.94		4.69
nonthly initial and replacement costs				5.43		8.45
Monthly Charges						
Fixture Charge						3.76
Replacement O&M						4.69
Energy and Distribution		0.0800	per kWh			2.68
TOTAL MONTHLY BASE CHARGE						11.13

Overhead Rates FY 2011	
Labor	72%
Materials	22%
General	18%

Overhead Factor
2.0296
1.4396
1.1800

UTILITY BOARD OF THE CITY OF KEY WEST, FLORIDA
Development of Lighting Rates

2011				**LED 34 Watt**		
Monthly kWh				11.4		11.4
				w/o OH		***w/OH***
Initial Cost						
Lamp				$ 429.63		
Luminaire						
Photo Cell				4.02		
Wire, Bolts, etc.				30.86		
Arm and Foot				119.76		
Total Fixture Cost			13	584.27		
Monthly Cost				3.75	1.4396	$ 5.39
	# hr.	***$/hr.***	***Yrs***			
Labor - Lineman	1	$ 33.68		0.22	2.0296	0.44
Labor Apprentice	1	$ 27.13		0.17	2.0296	0.35
Truck	1	$ 60.00		0.38	1.1800	0.45
Total Installation Costs				0.77		1.24
Total Monthly Initial Costs				4.52		6.64
O&M						
Lamp						
Labor - Lineman						
Labor - Apprentice						
Truck						
Photo Cell			5	0.07	1.4396	0.10
Labor - Lineman	0.75	33.68	5	0.42	2.0296	0.85
Labor - Apprentice	0.75	27.13	5	0.34	2.0296	0.69
Truck	0.75	60.00	5	0.75	1.1800	0.89
				1.58		2.52
Monthly Replacement Costs				1.58		2.52
monthly initial and replacement costs				6.10		9.16
Monthly Charges						
Fixture Charge						6.64
Replacement O&M						2.52
Energy and Distribution		0.0800	per kWh			0.91
TOTAL MONTHLY BASE CHARGE						10.07

Overhead Rates FY 2011	
Labor	72%
Materials	22%
General	18%

Overhead Factor
2.0296
1.4396
1.1800