



Date: February 25, 2016  
To: Cities of Rockland, South Portland, and Biddeford; and the Town of Falmouth  
From: Josh Heald - Pemco  
RE: Maine Street Lighting Conversion RFQ

MSLG Members:

In 2012, Pemco & Co. ("Pemco") and three other Maine companies ("Team") assessed, designed, procured, financed, installed and currently monitor and maintain a street and area lighting project at Brunswick Landing in Brunswick, ME. The project was the first of its kind in the United States to utilize radio frequency technology and cloud based software to remotely monitor and control public streetlight fixtures. Ever since then the opportunity to provide the same turnkey street lighting service to municipalities across the State of Maine has been shared goal. With the legislation in place and the MSLG blazing the trail, the time has come to leverage the collective experience and expertise of the Team and scale the application of the capabilities that deliver high-efficiency LED street lighting systems to reduce energy use, cut operating costs, and improve infrastructure with no upfront investment requirement.

The Team is proposing to provide Rockland, South Portland, and Biddeford; and the Town of Falmouth with our turnkey Street Lighting Investment Program ("Program"). This Program will meet and exceed the objectives and criteria set in the Request for Qualifications-Conversion of community street light systems to LED fixtures and from utility owned to municipally owned and maintained fixture on utility owned poles using the program's five (5) pillars of focus:

1. Assessment / Audit / GIS Mapping: the James W. Sewall Co., ("JW Sewall") Old Town, ME
2. Design, Specify, Procure/Bid: Swiftcurrent Engineering, Inc., Yarmouth, ME
3. 3rd Party Ownership Financing: Pemco & Co., LLC, Brunswick, ME
4. Installation / Commissioning: Enterprise Electric, Inc., Lisbon Falls, ME
5. Predictive Maintenance / Monitoring: Enterprise Electric, Inc., Lisbon Falls, ME

The Program is flexible where one client can utilize the full suite of services and another can choose four out of the five. We appreciate the opportunity to respond to your request for qualifications and look forward to moving these projects forward as soon as possible.

Pemco & Co., LLC, 772 US Highway 1, Suite 100, North Palm Beach, FL 33408 Tel: (561) 855-6613

## B. Company Profile

Pemco & Co., LLC, in partnership with JW Sewall, Swiftcurrent and Enterprise Electric is submitting credentials for consideration as the service provider to design and submit a turnkey proposal to assist the PM's objective of retrofitting streetlights with LED technology. The following offers profiles of the partnership member:

Pemco & Co., LLC:

Pemco invests in energy efficiency projects that reduce costs and improve asset value. Pemco offers full financing and delivers "energy-efficiency-as-a-service" solutions through a performance-based compensation model that requires no upfront capital.

Pemco offers municipal facility and infrastructure owners with a single source for their energy efficiency projects including:

- Full project management
- Energy cost reduction
- Increased energy efficiency
- Improved public safety
- Better working environment
- Upgraded technology
- End-to-end financing with no upfront costs

Pemco's performance-based compensation model requires no upfront capital, offers end-to-end project management and maintenance, and ensures that your savings are optimized.

Pemco has recent experience working the Midcoast Regional Redevelopment Authority (MRRRA) and the State of Florida in delivering turnkey lighting retrofit solutions using LED and RF adaptive control/monitoring systems. The capital investment value of these projects are between \$350,000 - \$30,000,000. The MRRRA project included auditing, designing, procuring, financing, installing and maintaining an array of more than 600 LED street and area fixtures. Pemco worked closely with Efficiency Maine to apply for and receive very substantial rebate support. Both Enterprise Electric and Swiftcurrent were critically involved on the team that delivered this turnkey solution that offered MRRRA in excess of 75% energy savings.

JW Sewall:

Sewall has extensive background in technical engineering, survey, design, and geospatial solutions, and includes GIS data collection and maintenance, project management, mapping, and imagery services among its core services lineup. Sewall's municipal services profile in Maine involves storm water and wastewater design, street and highway design, street and parking area lighting, municipal tax mapping, and municipal orthographic imagery collection and management.

Sewall brings extensive GIS/geospatial data capture, data maintenance, and project management background across the spectrum of industries, which uniquely positions the team to deliver an end-to-end, turnkey solution.

Swiftcurrent:

Tim Matthews established Swiftcurrent Engineering in 2004, P.E. Swiftcurrent offers comprehensive electrical engineering and lighting design services for Municipal, Commercial, Institutional, Educational, Residential, and Industrial clients. Services provided include the design of Primary Power Distribution Systems, Secondary Power Distribution Systems, Exterior Lighting, Lighting Control Systems, Life Safety Lighting and Power Systems, Uninterruptable Power Systems

Enterprise Electric:

Enterprise Electric is an Efficiency Maine Partner whose employees are Master and journeyman electricians, qualified as medium voltage linemen. The Enterprise Team does primary adds, moves and changes to MRRA distribution system. Enterprise performs storm outage restoration for Central Maine Power and is an MDOT lighting contractor.

## C. Key Personnel

### **Pemco & Co.** - Josh Heald, Pemco Founder and CEO

#### Education:

New York University, Masters in Finance, 2002  
Rollins College, BA in English 1974

#### Work Experience:

Principal, Pemco & Co., LLC, 2010 to Present  
VP - Finance, Tradition Development Corporation, 2002 to 2009

#### Member Organizations:

Former Guest Advisory Member - DOE Municipal Solid State Street  
Lighting Consortium - 2013  
Illuminating Engineering Society of North America  
International Dark Sky Association  
Association of Energy Engineers  
Energy Services Coalition

#### Speaking Engagements:

ACEEE Finance Forum  
NFMT  
BCxA Annual Convention

### **JW Sewall** - Andy Perkins, Senior Engineer - James W. Sewall Company

#### Education:

University of Maine, BSEE

#### Work Experience:

James W. Sewall - Senior Consultant  
Various Management Positions - Bangor Hydro Electric  
Senior Project Engineer - SGC Engineering

### **Swiftcurrent** - Tim Matthews, Founder and Principal

#### Education:

Plymouth State College, Masters in Business Administration, 1996  
University of Vermont, B.S. in Electrical Engineering, 1990

#### Affiliations:

Electrical Discipline Leader, SMRT, Portland, ME, 2000 to 2004  
Electrical Engineer, Earth Tech, Portland, ME, 1998 to 2000

#### Organizations:

Member, Institute of Electrical and Electronics Engineers  
Member, Illuminating Engineering Society of North America

#### Professional Registration:

Professional Engineer - New Hampshire, Maine,

**Enterprise Electric - Jeff Kelly, Partner**

Work Experience:

Enterprise Electric, Inc. - Estimator / Project Manager, 1992 to Present

Education and Training:

Principles of Substation Construction - 2008

Thermographer Level 1 - 2011

Lineman Instructor - 2014

Electrical Peer Group - 2015

#### D. References

Brunswick Landing (Pemco, Enterprise, Swiftcurrent)  
Midcoast Regional Redevelopment Authority  
2 Pegasus Street  
Suite 1 Unit 200  
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Tom Brubaker  
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Central Maine Power (Enterprise Electric)  
Dick Adams  
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Brunswick, Maine 04011  
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Tony Martin  
740 Main Street  
Lewiston, Maine 04240  
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Portland Jetport Lighting Projects, Portland, ME (Swiftcurrent)  
Roy S. Williams P.E. C.M. LEED AP  
Deputy Director  
Engineering and Facilities  
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1001 Westbrook Street  
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City of South Portland  
Matt LeConte  
Assistant Code Enforcement Officer  
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City of South Portland  
496 Ocean Street  
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## E. Approach

### 1. Audit

A street-level audit will be performed to capture and store GPS location data in a proprietary, database-driven software tool. Existing luminaire attributes, such as luminaire type, rated wattage, mount-style, utility pole number, street/road name (or other locational naming convention), and such other attributes as may be helpful in defining existing light coverage areas and informing the design of the future lighting plan, will be collected for each luminaire. The audit would occur partially during daytime hours in order to identify the luminaires and gather specific attributes, and during evening hours to determine existing coverage, luminescence, and sufficiency of the existing lighting inventory.

Additional screening using available imagery and automated software tools may be utilized to validate street-level data collection and inform the design of the proposed lighting plan. One recommendation in our project plan may include requiring available utility-managed inventory data be provided to the PM under existing street lighting contracts and payment agreements.

The GIS files will contain a dataset of features together with their attributes. Microsoft Excel files will list the Inventory (both existing and proposed) and will list all descriptive information in a sortable, searchable format. All expected outputs of the audit will be provided, including specific identified deficiencies in the current lighting network; current energy use and cost by luminaire type and in total, by subcategory; proposed energy use and estimated cost, using current and projected electricity costs; current and projected maintenance costs for the municipality; conversion cost, energy reduction, and payback period.

The PEMCO/Sewall team has relevant experience in the utility industry with field data collection and verification. Recent projects include point data verification and attribute tagging of over 75,000 individual point locations over a three-week period on a statewide project, using ESRI-driven software tools developed for the specific application. Sewall has developed tablet-based applications to input and validate locational data points and attributes in real time. Together, Sewall and PEMCO have the capability to perform an investment-grade audit of existing street lighting networks.

## 2. Financial Stability

Pemco has financed over twenty-five lighting projects using ESPC and Shared Savings contract structures and currently has over 100,000 light fixtures under management. The projects range from interior retail to exterior area and street lighting.

In 2015 Pemco was awarded via RFP a three-year contract with the State of Florida Department of Management Services to finance and deliver turnkey exterior lighting projects for facilities and infrastructure owned by the State of FL. The total contract investment is expected to exceed \$40 million in year three.

As a result of this contract, Pemco was engaged by the FL Department of Transportation, the FL Department of Corrections, Port of Tampa, and several towns and cities throughout the State for street and area lighting projects using our Shared Savings financing model.

In the State of Maine, Pemco developed, financed, and currently owns and operates the Brunswick Landing Street and Area LED Lighting Project, completed in partnership with Midcoast Regional Redevelopment Authority (MRRA). This work, which pioneered the use of dimming controls on public street lighting in the United States, includes the upgrade of 600 street and area lights with new LED fixtures and radio frequency-enabled control and monitoring systems. The improvements have reduced gross energy and maintenance costs by an estimated 80% and is paid for from savings generated by the program over a period of ten years. Pemco developed, financed and managed the installation using a Shared Savings Financing contract format.



### 3. Design

The street lighting design process that Swiftcurrent Engineering recommends considers and is dependent upon a number of factors including light fixture location, determination of the desired lighting levels based on activities in the area being lighted, and the avoidance of light trespass onto neighboring properties and compliance with local lighting specifications, i.e. the ANSI/IES RP-8-14 Roadway Lighting specification published by the IES.

The recently updated RP-8-14, if selected as the specification by the PM, highlights the following primary changes to the prior RP8 - 0 specification:

1. Focusing on the luminance method for straight roadway sections, therefore removing the illuminance method.
2. Increased emphasis on vehicle/pedestrian and bicycle conflict areas by increasing vertical illuminance.
3. Separate lighting criteria for isolated intersections (intersections where continuous lighting is not present).
4. Updated and/or re-affirmed design values for all roadway, street, toll plaza, walkway, intersection recommended lighting values.

The first step of the design process involves generating a photometric layout of the existing fixtures from the GIS map to see where coverage is failing, meeting, or exceeding the clients specification. Then an overlay of the specified LED lighting is included to ensure the new lighting system will meet the clients specifications. Areas that do not may require higher powered fixtures, different patterns, or the addition of new poles. Areas where an overlap or excess of lumens exists will generally result in a lower than average powered fixture or even the removal of certain fixtures (“de-lamping”). It is critical to get the pre and post project photometric report agreed upon by all parties prior to selecting the actual equipment.

It is our belief that manually measuring and comparing existing versus new lighting levels is not always the best way to determine the effectiveness of the design. LED light sources being based on a number of individual points of light, have very different light dispersion patterns when compared to HID sources. This eliminates hot spots inherent with HID fixtures and makes it easier to direct light where you want it and away from areas where you don't. The net effect is a reduction in light trespass onto neighboring properties. In most areas where utility poles or individual lighting poles are

already installed, maintaining even lighting is achieved through a combination of fixture output levels and light dispersion patterns.

Our design process will select the appropriate fixture output level and light dispersion pattern to achieve the specified lighting level throughout as much of the area of activity as possible and computer modeling to verify this in sensitive areas.

## 4. Project Management

Sewall uses a variety of formalized project management methodologies with each focused on project integration, scope, time, cost, quality, human resources, communications, risk, and procurement. The methodology selected is situation dependent and unique to each project. Below is Sewall's general approach to project management.

Sewall's 75+ staff members work on hundreds of active projects at a time. Selected employees are formally designated as Project Managers (PMs) and receive internal and external training in project management. Each project is assigned a single PM who has the authority and responsibility to manage resources throughout the life cycle of the project. Currently, Sewall employs 12 PMs.

The PM is responsible for assembling the proposal, specifications, estimates, and schedule at the planning stage of a given project, leading to a formal agreement with the client. For most multiple resource projects, a project plan is assembled by the PM for resource planning and balancing. The planning process focuses on resource allocation, dependencies, and milestones. A project budget is prepared and entered into the company's project accounting system based on the contracted project plan.

Additional documents that may be prepared depending on scope are:

1. Scope and Objectives
2. Functional Specifications
3. Risk Management and Mitigation Plan
4. Phased User Rollout Plan

The PM monitors the progress and resource usage on a regular basis, adjusts the plan as needed, and provides status reports to the client until the project is completed.

## 5. Technology Procurement

a. Fixtures: Based on the final agreed upon photometric layout, Swiftcurrent will select 3-4 manufacturers whose fixtures meet the specified criteria. There could potentially be 3-4 for each type of streetlight. Pemco's involvement includes due diligence on all street light manufacturers and their warranty program. We require a minimum six to ten (6-10) year warranty on the entire fixture including the driver. All parts must be under the same warranty. Manufacturers must be consulted to ensure that the warranty will not be voided because a particular street light control / monitoring device was selected over a manufacturer-preferred brand. Additionally, significant negotiation takes place to get the manufacturers to accept the monitoring/control devices and ideally have them installed in the factory as any installed outside of the factory have the potential to void the fixture manufacturer warranty.

*See Section G. Additional Information - Minimum Requirements and Selection Criteria*

b. Smart Controls and other Smart City Solutions. The Team is experienced with the specification, selection, installation, and use of radio frequency, cellular, and or Wi-Fi connected dual communication controls and monitors. The hardware/software combination is used with each streetlight and strategically located gateways to collect energy consumption data from each streetlight. Additionally, with consensus from the PM, individual or groups of fixtures can be dimmed according to customized schedules that correlate with traffic patterns for additional savings. Our experience has been that this control package has the ability to save up to an additional fifteen (15%) percent on energy use. The real benefit of the control/monitoring system is its ability to monitor the project and identify maintenance issues before the fixtures fail. The Team will typically set up the software to send alerts to the maintenance contractor when fixtures go off line and act erratically. Caution must be exercised when selecting the proper system so as not to void the fixture warranty. Whenever possible it is advisable to have the selected control/monitoring system installed in the factory.

Pemco has recently tested various "Internet of Things" applications that can be included with LED fixtures to monitor and transmit data back to central command on a host of applications such as weather, air quality, traffic, parking availability, emergency response assistance and other general data that a municipality needs to operate. While the feasibility of such technology remains largely to be seen, the Team suggests selecting and configuring the fixtures for future accommodation.

Additional "small cell" wireless technology can be installed into street light poles to provide additional cellular coverage across the municipality

boundaries. This can generate additional revenue for the municipality as the wireless carriers enter into long term contracts to be able to utilize the fixtures and poles to increase their network coverage.

## 6. Installation & Maintenance

Under a typical project, the Team is responsible for all predictive and responsive maintenance. Potential issues are reported using the monitoring/reporting control system, the smart phone application, or residents calling the 1-800 number provided on a copper label affixed to each street light pole. The Team commits to responding to the scene within a forty-eight hours (or less) timeframe to assess the issue. The maintenance contractor is provided with a number of replacement fixtures upon completion of the project. This enables them to go to the fixture reported with a replacement fixture, change out the fixtures, and send the non-operational fixture back to the manufacturer for replacement under warranty.

In the process of retrofitting nearly 600 lights at the Midcoast Regional Redevelopment Authority in Brunswick, Enterprise Electric developed a very effective system for lighting replacement. Enterprise will coordinate these processes with the Sewall Project Management Team (see section 4. Project Management and section 7. Construction Administration) to complete the street lighting project(s) as expeditiously as possible.

Enterprise will rent (2) shipping containers and have them moved to a central location in each town. One container will store new fixtures and the second will serve as a storage unit for the demolished fixtures.

Every 2 weeks (or as needed), Enterprise will make a deliveries to each site to restock the new fixture trailer and haul the demolished fixtures back to the Enterprise shop for disassembly, sorting into bins of like materials, and then hauling for disposal. Lamps will be packaged in containers and shipped out through a certified lamp recycler to be disposed of.

Using the installed RF lighting control package, Enterprise will take the GPS coordinate of every light fixture in the system and enter them into the control online application software. Once the fixtures are brought online (energized) and programmed, they will display as active in the system.

Each field installer will provide a daily report to the Sewall Project Management Team showing where they worked, how many fixtures were installed, and what they used for material and equipment. We will also provide this information to each Town so that they can monitor the progress of the project.

With respect to Enterprise Installation and Maintenance credentials, our employees are qualified to work in the primary distribution work zone where light fixtures are retrofitted. Central Maine Power includes Enterprise on their call list for power restoration during storm conditions. We provide

emergency services on the primary distribution side to Midcoast Regional Redevelopment Authority (MRRA) in Brunswick, Colby College in Waterville, Bowdoin College in Brunswick, and Southern Maine Community College in South Portland.

Additionally, Enterprise currently has contracts with the Town of Topsham to monitor and repair street lights owned by that municipality.

See Resident Maintenance Reporting App under Value Add

## 7. Construction Administration

Sewall will provide construction administration services for the duration of project construction. Services include attending a construction review meeting with client representatives, overseeing a pre-construction meeting, review and approval of drawings and quality control (QC) plans, substantial completion and final completion inspections, and punch list development and oversight.

**Traffic Control Safety:** Sewall will be responsible for drafting and implementing the Traffic Control Safety Program in cooperation with client representatives. Work under this section includes all of the labor, materials, tools, and equipment necessary for directing traffic safely and expeditiously through or around work areas within the right-of-way. This is a critical component to a safe and successful project and cannot be understated. Sewall will remain flexible and work with the different Traffic Control Safety policies and procedures of each client.

Sewall's Lead Engineer will be responsible for construction administration, As-Built drawing oversight, as well as final Quality Assurance (QA) certification.

Sewall Construction Administration responsibilities will also include the following:

- Maintaining an accurate daily project diary, which includes details of the day's work, weather, crew & equipment, field measurements, daily quantities, etc.
- Oversight of project testing performed by the Contractor
- Tallying total project quantities
- Determining if contractor activities are performed per design plans and specifications.



## 8. Acquisitions of Streetlights

Upon selecting two to three fixture manufacturers and models a bid will be conducted whereby distributors will submit quotes. The distributor with the lowest bid, most appropriate terms and delivery period is selected.

## 9. Rebates/Incentives

Pemco has had a few discussions with Efficiency Maine. The general consensus is that while there are no rebates currently for street lighting, E. Maine is aware of the situation and is expecting to potentially begin offering some level of rebates for municipal street lighting retrofits. Both Enterprise Electric and Pemco are Qualified Partners with Efficiency Maine and will continue to keep an eye on any changes in their incentives for outdoor/street lighting.

Pemco will continue to search State and Federal level rebate opportunities for inclusion in the street lighting process.

## F. Value Added Services

Installation Alternative: As a potential alternative to hiring Central Maine Power to perform the installation, the Team asks PM to consider allowing us to try and negotiate a situation that will allow Enterprise Electric to perform the connection duties currently limited to CMP workers. The reason is Enterprise Electric has a trained team that frequently performs all functions that the CMP crew does on a subcontract basis. In fact, if CMP were hired to perform the installation and the required connections, there is a good chance they would subcontract Enterprise Electric to perform the actual work. The obvious benefits would be lower cost and greater control.

Resident Smart Phone Maintenance Reporting App: Sewall will develop a custom smart phone application for each client. The application is based on the GIS Map in real time and allows residents to identify each fixture throughout the community by simply standing under the fixture with the application open. Using a series of drop down menus, residents have the ability to report flickering or non-operating fixtures to alert the maintenance contractor of the issue.

## G. Additional Information

### Minimum Requirements and Fixture Selection Process

<b>MINIMUM REQUIREMENTS FOR LED LUMINAIRES – ALL TYPES</b>	
1	Warranty: 6-year minimum
2	CCT: 4000°K, ±300°K
3	Vibration: Level 2
4	THD max: 20%
5	Surge Protection: 10kV
6	UL Listing: 1598
7	Power Factor minimum: .90
8	RF Interference: CC 47 CFR part 15/18
9	Dimming signal: 0-10V
10	Sound Rating: Class A
11	Luminaire Housing IP Rating: IP54 min
12	Housing : Die Cast Aluminum
13	Door: Hinged, downward-opening
14	Fixture has a slip fitter capable of mounting on 2.25 – 2.50 OD pipe tenon
15	Fixture has no parts constructed of polycarbonate unless it is UV stabilized
16	NEMA ANSI C136.41 receptacle included
17	Optical Assembly: IP-66
18	RoHS compliant
19	Finish rating per ASTM D1654: >6
20	LED Luminaire and/or the LED luminaire Family must be approved by the Design Lights Consortium (DLC) for inclusion on their Qualified Products List.

## Selection Criteria / Process

The Team will assist PM in identifying and selecting the proper LED fixtures by distributing the Basic Requirements (see attached) to a minimum of 20 of the top manufacturers of LED street lights. Each manufacturer who wishes to have their fixture considered will submit sample fixtures, documentation, and a means to have each sample installed in an area selected to serve as the demonstration area over a period of two to three weeks. Once installed each luminaire would be tested by Swiftcurrent and the Team for the following:

### Step 1 - LED Luminaire Sample Evaluation - Ease of Installation and Maintenance

The sample will be reviewed for ease of installation and maintenance, and durability.

Criteria:

1. Length of time to install Sample
2. Number of tools needed to install Sample
3. Adjustability of Sample on Tenon Arm
4. Fixture weight
5. Access door configuration and security
6. Quick disconnects on Sample circuitry

### Step 2A - LED Fixture Technical Proposal Evaluation

#### a. LED Fixture Technical Submittal

LED fixture submittals including catalogue cuts, test reports, warranty language, certifications, which will be reviewed to confirm compliance with the technical specifications and to evaluate the additional features offered by each product.

Evaluation Criteria:

- i. Warranty Language for Fixture and Driver
- ii. Lumen Maintenance
- iii. Fixture Design and Aesthetics
- iv. Backlight Control Options
- v. CRI

## b. LED Luminaire Photometric and Energy Performance

The primary goals for the LED luminaires are to meet or exceed light levels provided by the existing HPS fixtures, while achieving average energy savings of at least 50% over existing luminaires.

To evaluate LED luminaire lighting performance, the proposers will complete a photometric analysis using the AGi32 files provided on the OCA website to model light distribution in 6 different San Francisco streets for the 6 fixtures matching those proposed in the Appendix D - Cost Proposal. The design parameters for each street are provided in Appendix E. The proposer is not expected to meet average illuminance levels and uniformity ratios defined in IES RP-08 for each street. However, SFPUC does value the ability of the Proposed fixtures to improve the lighting service being delivered, using RP-08 as a guideline for doing so. The Proposer should consider the balance between increasing light levels above the current conditions and achieving the desired energy performance.

Details regarding the energy performance evaluation are provided.

In evaluating both the photometric and energy performance of the proposal, performance of each fixture type will be weighted based on the existing inventory size, such that the performance of proposed fixtures for more common wattage bins will carry greater value.

### Evaluation Criteria:

- i. Minimum illuminance values as they compare to existing minimum illuminance values
- ii. Average illuminance values as they compare to existing average illuminance values and RP-8 recommended average illuminance values
- iii. Average-to-minimum uniformity ratios as they compare to existing average-to-minimum uniformity ratios and RP-8 recommended average-to-minimum uniformity ratios
- iv. The percent of energy saved compared to the existing fixtures, where fixtures meeting the desired minimum illuminance levels that achieve greater energy savings will be scored higher.
- v. Qualitative assessment of distribution patterns in photometric renderings produced in AGi32
- vi. Sidewalk light levels