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February 22, 2017



Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

**RE: In the Matter of Otter Tail Power Company's Petition for Approval of the Company's proposed LED Street and Area Lighting rate schedule 11.07 and associated LED implementation plan.
Docket No. E017/M-17-
Initial Filing**

Dear Mr. Wolf:

Otter Tail is filing this proposal with the Minnesota Public Utility Commission (MPUC) requesting; approval of its proposed LED Street and Area Lighting – Dusk to Dawn Section 11.07 rate schedule, closure to installations of its Outdoor Lighting Dusk to Dawn Section 11.04 rate schedule, and requesting the MPUC's support of the Company's recovery of a portion of the project costs through the CIP tracker account.

Otter Tail has electronically filed this document with the Commission and is serving a copy on all persons on the official service list for this docket. A Certificate of Service is also enclosed.

If you have any questions regarding this filing, please contact me at 218-739-8595 or at jgrenier@otpc.com.

Sincerely,

/S/ JASON A. GRENIER
Jason A. Grenier
Manager, Market Planning
JAG:kaw
Enclosures
By electronic filing
c: Service List

**STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

In the Matter of Otter Tail Power Company's
Petition for Approval of the Company's proposed
LED Street and Area Lighting rate schedule 11.07
and associated LED implementation plan.

Docket No. E017/M-17-

SUMMARY OF FILING

Otter Tail is filing this proposal with the Minnesota Public Utility Commission (MPUC) requesting; approval of its proposed LED Street and Area Lighting – Dusk to Dawn Section 11.07 rate schedule, closure to installations of its Outdoor Lighting Dusk to Dawn Section 11.04 rate schedule, and requesting the MPUC's support of the Company's recovery of a portion of the project costs through the CIP tracker account.

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**PETITION OF OTTER TAIL
POWER COMPANY**

I. INTRODUCTION

Otter Tail is filing this proposal with the Minnesota Public Utility Commission (MPUC) requesting; approval of its proposed LED Street and Area Lighting – Dusk to Dawn Section 11.07 rate schedule, closure to installations of its Outdoor Lighting Dusk to Dawn Section 11.04 rate schedule, and requesting the MPUC's support of the Company's recovery of a portion of the project costs through the CIP tracker account.

II. SUMMARY OF FILING

Pursuant to Minn. Rule 7829.1300, Subp. 1, a one-paragraph summary of the filing accompanies this Petition.

III. GENERAL FILING INFORMATION

Pursuant to Minnesota Rule 7829.1300, subp. 3, the following information is provided.

A. Name, address, and telephone number of utility
(Minn. Rules 7829.1300, Subp. 3(A))

Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
Fergus Falls, MN 56538-0496
(218) 739-8200

B. Name, address, and telephone number of utility attorney
(Minn. Rules 7829.1300, Subp. 3(B))

Cary Stephenson
Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
Fergus Falls, MN 56538-0496
(218) 739-8956
cstephenson@otpc.com

C. Date of filing and proposed effective date of rates
(Minn. Rules 7829.1300, Subp. 3(C))

The date of this filing is February 22, 2017. Otter Tail proposes the LED Street and Area Light Section 11.07 rate schedule, and closure to new installations of its Outdoor Lighting Section 11.04 rate schedule to become effective June 1, 2017, or on the first day of the month following Commission approval, should its decision be thereafter.

D. Statutes controlling schedule for processing the filing
(Minn. Rules 7829.1300, Subp. 3(D))

Minn. Stat. §216B.16 permits a utility to implement a proposed rate change after giving the Commission a 60 day notice. This proposed filing; closes an existing tariff, creates a new tariff, and requests support of recovery of a portion of the project costs, falls under the definition of a “miscellaneous tariff filing” under Minn. Rules 7829.0100, Subp. 11, with Minn. Rules 7829.1400 allowing initial comments within 30 days of filing and replies no more than 10 days thereafter.

E. Title of utility employee responsible for filing
(Minn. Rules 7829.1300, Subp. 3(E))

Jason A. Grenier
Manager, Market Planning
Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
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(218) 739-8639
jgrenier@otpc.com

F. Impact on rates
(Minn. Rules 7829.1300, Subp 4(F))

Otter Tail's LED implementation plan will slightly impact customer's monthly lighting charges; however, the overall impact is revenue neutral to the Company's current base rates. See Attachment A for specific impacts. The additional information required under this Rule is included throughout the Petition.

G. Service list
(Minn. Rules 7829.0700)

Otter Tail requests that the following persons be placed on the Commission's official service list for this matter and that any trade secret comments, requests, or information be provided to the following on behalf of Otter Tail:

Jason A. Grenier
Manager, Market Planning,
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H. Service on other parties
(Minn. Rules 7829.1300, Subp. 2; Minn. Rules 7829.0600)

Pursuant to Minn. Rule 7829.1300, Subp. 2, Otter Tail has served a copy of this Petition on the Division of Energy Resources of the Department of Commerce and the Antitrust & Utilities Division of the Office of the Attorney General. A summary of the filing prepared in accordance with Minn. Rule 7829.1300, Subp. 1 was served on all parties on Otter Tail's general service list.

IV. DESCRIPTION AND PURPOSE OF FILING

A. Background

Otter Tail Power Company (Otter Tail) proposes to strategically retrofit all company-owned street and area lighting fixtures throughout Otter Tail's Minnesota service area from High-Intensity Discharge (HID) to an equivalent (Light Emitting Diode) LED technology over a five-year period starting in 2017. Otter Tail initially included this plan in its 2017-2019 Conservation Improvement Program (CIP) plan, filed June 1, 2016, in Docket No. E017/CIP-16-116. On November 3, 2016, Deputy Commissioner of the Department of Commerce (DOC), Mr. Bill Grant, issued a Decision approving Otter Tail's 2017-19 CIP plan, including the company-owned street light project and the associated spending budget, participation-quantities, and energy savings.

Otter Tail is filing this proposal with the Minnesota Public Utility Commission (MPUC) requesting; approval of its proposed LED Street and Area Lighting – Dusk to Dawn Section 11.07 rate schedule, closure to installations of its Outdoor Lighting Dusk to Dawn Section 11.04 rate schedule, and requesting the MPUC's support of Otter Tail's recovery of a portion of the project costs through the CIP tracker account.

B. Overview of Led Street and Area Lighting Project

Otter Tail provides illumination services to 161 Minnesota communities and other customers through company ownership, operation, and maintenance of approximately 19,500 street and area lighting fixtures. In exchange for a monthly fee, customers receive illumination service, including equipment installation, asset rental, electricity, and maintenance in a convenient, monthly charge on the customer's electric service bill. Otter Tail installs street and area lighting fixtures at the request of our customers and, consequently, classifies electricity consumption for company-owned street and area lighting fixtures as customer electricity usage. Otter Tail's municipal and other customers account for about 19,500 fixture installations throughout Minnesota. An additional 253 fixtures, or about one percent, are used by Otter Tail in exterior applications at the Company's substations and other facilities.

Through the Company's Department of Commerce (DOC) approved CIP program, Company-owned Street and Area Lighting, the Company plans to strategically retrofit all company-owned street and area lighting fixtures throughout Otter Tail's Minnesota service area from HID to LED technology over five years. Advantages of LED technology over conventional HID systems include:

1. Equipment life.

LED fixture life in street and area lighting applications is often rated at 100,000 hours, where equivalent HID products operate with rated lives of only 10,000 to 24,000 hours.

2. Lumen depreciation.

Lumen depreciation for most HID products can reach 50 percent, where most LED fixtures often operate at 70 percent of rated lumen output at end of rated life.

3. Energy efficiency.

E Source reports that the average efficacy of 100-, 250- and 400-watt HID street and area lighting fixtures is about 61 lumens per watt. Equivalent LED fixtures operate at an average efficacy of 94 lumens per watt, or about 55 percent more efficiently, than HID.

4. Light quality.

Today's LED fixtures operate at a much higher color rendering index (CRI) than most HID products, enabling drivers and pedestrians to more safely observe night time conditions due to improved light quality.

The following table from E Source's *LED Applications: Parking and Street Lighting* compares key product attributes between LED and HID technologies:

Table 1: HID vs. LED Performance

Metric	100-W equivalent		250-W equivalent		400-W equivalent	
	HPS	LED	HPS	LED	HPS	LED
Output range (lm)	6,430	5,500–6,500	19,600	19,000–21,000	32,000	25,000–40,000
Power range (W)	NA	50–115	NA	128–298	NA	184–566
Average power (W)	130	70	296	214	446	312
Efficacy range (lm/W)	NA	48–125	NA	66–139	NA	63–141
Average efficacy (lm/W)	50	88	66	95	72	100
CRI range	20	62-85	20	63-91	20	63–91
Average CRI	20	73	20	73	20	73
CCT range (K)	2,000	2,900–6,150	2,000	3,000–6,200	2,000	3,000–6,016
Number of products in the Lighting Facts database	NA	278	NA	121	NA	269

Notes: CCT= correlated color temperature; CRI = color rendering index; lm = lumen; NA = not applicable; W = watt.

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HPS baseline based on measured values in Demonstration of LED Street Lighting Host Site: City of Kansas City, Missouri (http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2013_gateway-msslc_kc.pdf). Values for output and efficacy are for a fixture, not only a lamp. Number of products in the Lighting Facts database as of February 2016.

Many of Otter Tail customers, along with Otter Tail’s utility peers, have made the switch to LED lighting systems. The U.S. DOE report, *Adoption of Light-Emitting Diodes in Common Applications*, states that prices of area and roadway luminaires fell by 50 percent between 2010 and 2014. According to E Source, by the end of 2014, average LED market penetration for outdoor lighting was ten percent, compared to just three percent for indoor lighting. In outdoor lighting, LED market penetration is highest for area and roadway lighting. Increases in product quality combined with recent price reductions are leading more utilities and end-users to cost effectively retrofit less efficient HID lighting systems to LED technology.

Table 2

Location of LED product	Percentage of market (%)
Area / roadway	12.7
Parking lot	9.7
Parking garages	5.0

© E Source

Otter Tail believes the time is right where prices for the technology are now reasonable, and the technology is a proven long-lasting efficient lighting solution. In addition, numerous Minnesota communities served by Otter Tail are requesting LED lighting.

LED Fixture Selection

In Otter Tail’s 2017-19 CIP plan, Otter Tail described a specific LED product to be used for this LED lighting project. After further testing in several of our North Dakota communities we have identified a separate product we plan to implement. After field testing Otter Tail chose the Acuity Brand Lighting product line to replace all Minnesota street and area lighting. Otter Tail based this decision on customer and field staff input. Otter Tail believes the Acuity LED’s performance, cost, and ease of installation and maintenance make it the most appropriate solution for the Company’s and our customer’s street and area lighting needs. Otter Tail has also worked very closely with our lighting supplier to gather information on lighting options and successful implementation strategies used by other municipalities and electric cooperatives. The product specification sheets list this product as, “NIGHTTIME FRIENDLY and consistent with

LEED®¹ goals and Green Globes™² criteria for light pollution reduction.” The product specification and photometric sheets have been included in this filing as Attachment F.

Implementation of Project

Otter Tail will rely primarily on personal interactions between Company energy management representatives, service representatives, area managers, and community leaders for promoting the program. In the interest of better serving their constituents, leaders of a number of municipalities served by Otter Tail have already initiated discussions on proactively retrofitting existing HID fixtures to LED fixtures. Otter Tail also plans to include bill inserts to customers notifying them when we will be in their community to change out there lighting fixtures.

Otter Tail’s energy management representatives have met with multiple Otter Tail community leaders to ensure they support the Company’s LED lighting offerings. One community has specific lighting codes which require all outdoor lighting to comply with Dark Sky Compliance rules. After constructive discussions with the community and their planning board, Otter Tail added a visor option for the proposed flood lights to limit light trespass and potential up-light. The community has indicated they are in favor of the proposed LED transition plan. They stated, “We feel the energy savings and modernization of the roadway/alleyway lighting system is a great step forward and approve of the project.”

Otter Tail plans to first retrofit communities who have already replaced their own HID fixtures to LED fixtures. Currently these communities have a mismatch of LED (City-owned) and HID (Otter Tail-owned) fixtures. This inconsistency in lighting technologies creates a non-aesthetically pleasing experience for residents of these communities. Otter Tail field staff plan to continue to work with our communities to develop a queue of communities to participate in the project. Otter Tail has included Attachment C, showing all 161 communities and the associated quantities of fixtures to be changed out over the five-year project. In addition to communities, some of the lights are used by private customers for security and area lighting. These lighting quantities are also included in the Attachment C quantities, and will be changed to LED at the same time their community lights are replaced. Once the LED rate schedule is approved, going

¹ Leadership in Energy and Environmental Design (LEED)

² The Green Globes system delivers an online assessment protocol, rating system and guidance for green building design, operation and management. It is interactive, flexible, and affordable, and provides market recognition of a building’s environmental attributes through third-party verification.

forward all failed HID lights anywhere in Otter Tail's Minnesota service territory will be replaced with an LED. Otter Tail's first focus will be on replacing customer-use lighting. Once all community and area lights are replaced, Otter Tail will then replace all exterior lighting used by Otter Tail at its substations, and other facilities.

C. Proposed Led Street and Area Lighting; Tariff Sheet Modifications & Rate Design

Proposed Led Street and Area Lighting Rate

Otter Tail proposes to retrofit all company-owned street and area lighting fixtures throughout Otter Tail's Minnesota service area from HID to LED technology over a five-year period starting in 2017. All upfront fixture costs and installation cost will be paid by Otter Tail. Otter Tail does not propose to increase the current monthly lighting charges to customers. Instead, Otter Tail proposes no change to revenue requirements and plans to retrofit the existing HID fixtures to LED, while maintaining a very similar monthly charge to customers. The only immediate financial impact the LED project has on customers is the increased expenses to the CIP account tracker. These additional costs are associated with energy savings which produce \$1,175,835 in annual societal net benefits, proving the project is cost effective.

Otter Tail plans to charge customer's nearly the same monthly rate after the LED installation as the customer currently pays monthly for the HID fixture, with no additional revenues for Otter Tail. As shown in Otter Tail's Attachment A, some customers will pay slightly more each month, while other will pay slightly less. Overall customer revenue requirements for Street and Area Lighting will not change. Otter Tail will not receive any additional monthly revenue from this project. With very minimal impacts to customer's bills, Otter Tail believes all communities and customers will welcome the LED lighting offering.

Attachment A shows the current rates customers are paying monthly for each lighting type. Sixty-five percent of customer's bills are for the HPS9 light. These customers will see an increase of \$0.02 monthly in the interim period once their light is replaced to an LED. Otter Tail currently has General Rate Case, Docket No. E017-GR-15-1033 (2016 Rate Case), before the MPUC. Attachment A shows the monthly rates proposed for customers as they switch to the LED lighting during the interim rate period and for final proposed rates. It is important to note customers will stay on existing approved interim rates or approved final rates from the General Rate Case until their light is replaced with an LED equivalent. Attachment A also shows the overall revenue impacts to changing the lights to LED over the interim period and for final

proposed rates. The overall impact to customer revenue requirements for both periods is less than five dollars annually, as show at the bottom of Attachment A. All final proposed rates will be updated and included in the 2016 Rate Case compliance filing once the MPUC issues its final order in that proceeding.

Tariff Sheet Modifications

The Company proposes to create a new “LED OUTDOOR LIGHTING DUSK TO DAWN” Section 11.07 of The Electric Rate Schedule Tariff sheets to introduce the LED rates. The modifications will allow the smooth transition from one rate to another and establish the monthly rates for each light type. The Company proposes to modify Page 1 of the current tariff sheet, Section 11.04 “OUTDOOR LIGHTING DUSK TO DAWN”, of The Electric Rate Schedule to include the “CLOSED TO NEW INSTALLATIONS” message. The new tariff sheets are presented as Attachment G (clean version), and the modified tariff sheets are provided as Attachment H (redline version and clean version). The proposed modifications are summarized in two categories: tariff sheet cleanup and LED rate driven.

The proposed LED implementation plan is scheduled to take five years to complete. As HID lights are changed out to LED lights, customers will be moved from Section 11.04 to Otter Tail’s proposed Section 11.07 rate schedule. Once all lights have been converted to LED in 2021, all customers will be on the proposed Outdoor LED Lighting Section 11.07 rate schedule; with none remaining on the current Outdoor Lighting Dusk to Dawn Section 11.04 rate schedule.

“Attachment G” provides modified tariff sheets of the applicability matrices of Sections 12.00 “PURCHASE POWER RIDERS”, 13.00 “MANDATORY RIDERS”, and 14.00 “VOLUNTARY RIDERS” of The Electric Rate Schedules. Section 12.00, 13.00, and 14.00 Page 1 include the addition of the new proposed rate schedule 11.07 “LED Street and Area Lighting” under the “Other Services” section with the proper indications for the Purchase Power Rider tariffs, Mandatory Riders, and Voluntary Riders, respectively. We are also including an addition to Section 13.00 Page 2 for Section 14.12 “Off-Peak Electric Vehicle Rider”, as approved on June 22, 2015 per Docket E017/M-15-112, under the “Voluntary Riders” section with the proper indications of the Mandatory Rider tariffs to properly include all applicable rates within the matrix.

Proposed LED Street Lighting Rates

Otter Tail's LED proposal took into account the following steps: compare current street and area lighting offerings to new LED offerings, costs to serve, revenue requirements, customer bill impacts, and the transition timeframe.

The first major step was to select new and available LED technologies with equivalent lighting characteristics to the current Street and Area Lighting options. Otter Tail's Materials Engineering Department worked with our lighting supplier to develop a set of LED fixture offerings that handle the current lighting offering to a greatly reduced set of new LED technologies. Table 3 lists the current HID lighting type and the equivalent new replacement LED lighting types:

Table 3

Street and Area Lighting		Area Flood Lighting	
HID (OLD) Light Type	LED Equivalent Light Type	HID (OLD) Light Type	LED Equivalent Light Type
HPS9PT	LED3PT	400 HPS	LED20FLOOD
MV6PT	LED3PT	400 MA	LED20FLOOD
HPS14	LED5	400 MV	LED20FLOOD
HPS9	LED5	SIGN	LED20FLOOD
MH8	LED5	1000-MA	LED30FLOOD
MV6	LED5	1000-MV	LED30FLOOD
HPS14PT	LED5PT	1M-HPSF	LED30FLOOD
MH8PT	LED5PT		
HPS19	LED8		
MH14	LED8		
HPS23	LED10		
MH20	LED10		
MV11	LED10		
MV21	LED10		
HPS44	LED13		
MH110	LED13		
MH36	LED13		
MV35	LED13		

The second step required Otter Tail to perform an LED Marginal Cost of service study for the proposed LED fixtures and pole offerings (See attachments B, D and E). This study calculated the proposed bundled service rates based on the new LED fixtures capital and O&M costs.

1. Attachment B contains proposed LED fixtures costs.
2. Attachment D is dedicated to the cost of the different pole types, which support the light fixtures. Offering several pole options became necessary since some municipal customers have expressed interest in a metal type of pole. The existing rate calculations are based on a 30 ft. wood pole.
3. Attachment E encompasses the Marginal Cost of Service calculations for the fixtures, poles and lighting visors, based on the 2016 Dollar value.

The third step in our proposal to calculate rates involve the revenue requirement. The LED street lighting rates were developed based on the same methodology used to develop the Company's existing rates:

*"The rate design should give OTP a reasonable opportunity to achieve its revenue requirement. This implies rate structures that follow OTP's marginal cost structure, thereby allowing revenues to track costs."*³

In the Company's 2016 Rate Case, D. Prazak has explained in the proposed Lighting Rate Design (i.e. the current offering, Section 11.04,

Lighting class revenues were allocated to each rate class uniformly at the same percentage increase as recommended by Mr. Beithon for the customer class overall. An EPMC⁴ approach was not viable because of the significant mismatch between marginal costs and existing rate structures⁵. Also, we are in the process of re-examining our Lighting offerings in the context of increased adoption of light-emitting diode (LED) street lights. We anticipate filing a petition with the Commission outside of this case to revise our Lighting offerings to accommodate LED street lights⁶.

The proposed rate design in this petition for Otter Tail's new LED outdoor lighting offering is consistent with the methodology discussed in the current rate case.

After exploring different methods of allocating revenue requirements (Equal Percent of Marginal Cost and Weighted Average Method) to the appropriate LED rate groups, Otter Tail

³ *In the Matter of the Application for Authority to Increase Rates for Electric Service in MN*, Docket No. E017-GR-15-1033 Docket No. E017/GR-15-1033, Prazak Direct Page 10. Page 3.

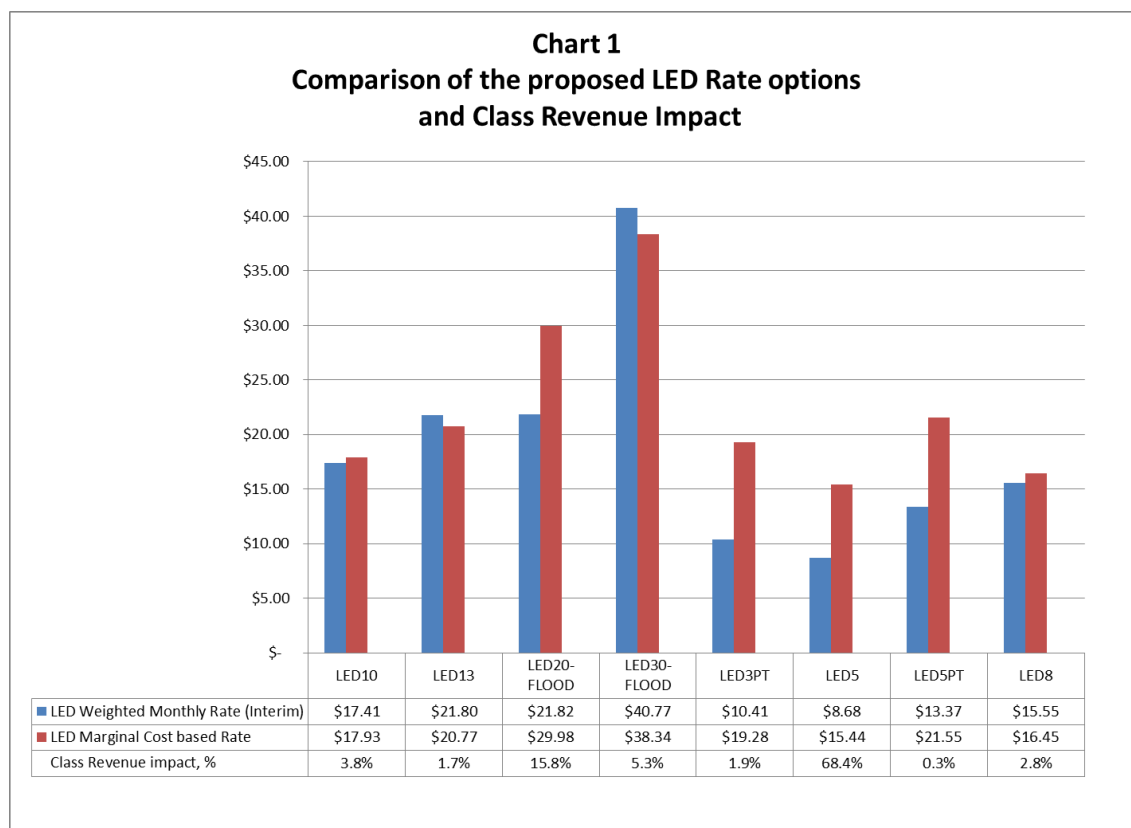
⁴ Equal Percent of Marginal Cost

⁵ Later in this petition Otter Tail will show an illustration of the relationship between the Marginal Cost based rates for LED fixtures and proposed Weighted Average based Rates

⁶ *In the Matter of the Application for Authority to Increase Rates for Electric Service in MN*, Docket No. E017/GR-15-1033, Prazak Direct Page 10.

developed a Weighted Average Method of Allocating revenue requirements for the Current Fixtures in the corresponding LED fixture types (Attachment A). This method was used over the Equal Percent of Marginal Cost method to limit the impact to customers, thereby making the transition to the LED lighting technology to be as smooth as possible. Attachments B and D are the precursors to the Attachment E and contain the breakdown of the new fixtures and poles costs.

Chart 1 below, is an illustration of the relationship between the Marginal Cost based rates for LED fixtures and proposed Weighted Average based Rates. The same Chart displays the Class Revenue Impact of each fixture type. The Class Revenue Impact breaks out the revenues from each lighting type. The proposed LED5 type, which comprises the former⁷ lighting types, has the greatest proportion of revenue at over 68 percent. In this transition, Otter Tail proposes a balance of currently offered rates versus the marginal costs. Furthermore, not all Marginal Cost based prices are higher than the proposed Weighted Average prices, e.g. LED30-Flood, but overall we have a balanced proposal to offer to our customers.



⁷ As described in Attachment, the proposed LED5 lighting type contains the following lighting types - HPS14, HPS9, MH8 and MV6. In other words, the LED5 type will replace 3 different types and sizes of lighting technologies (high pressure sodium, metal halide and mercury vapor).

The LED street lighting rate is derived following the same basic methodology used to develop Otter Tail's existing street lighting rates. In Otter Tail's 2016 Rate Case the lighting cost-of-service and Marginal Cost studies were used. This analysis incorporates the annual revenue requirements associated with purchasing, installing and maintaining equipment, along with the cost of providing electricity. The customer pays a monthly rate for each Otter Tail-owned street light plus all applicable adjustments.

In calculating the new fully-bundled LED lighting services, we are using a standard, approximately 30ft, wood pole and including its cost in the rate. To meet our customers' needs we are offering an expanded option for the Aluminum Alloy Poles and pricing them separately. For customers who choose to utilize the Aluminum Alloy Pole option, the rate design will be applied in addition to the LED Light bundled costs-including the wood pole. In other words, the rates for the Aluminum Alloy Poles are incremental costs - not full costs. This arrangement insures customers are paying the associated costs for either wood or Aluminum Alloy Poles.

In one of our service area communities we had a request to make our Flood Lights "Dark Sky Compliant". Otter Tail is offering an additional option for customers who are concerned about minimizing lighting pollution. The rates for the Dark Sky compliant options only include these specific costs.

To illustrate the customer options described above, a customer can pay for bundled LED outdoor flood lighting services on a wood or aluminum pole, with or without lighting visors, and the associated costs for these options.

D. Partial Cost Recovery through CIP Tracker Account

Otter Tail's 2017-2019 CIP plan, approved by Deputy Commissioner Mr. Bill Grant, includes a plan to recover eligible LED project costs through Otter Tail's CIP tracker account. Otter Tail's participation in CIP is allowed by previous MPUC orders. On July 16, 2013, in Docket No. E,G-999/DI-12-1342, the MPUC stated in Order point number one,

"The Commission hereby finds that utilities may participate in CIP projects at their own facilities and that the associated customer and/or vendor incentives, program delivery, evaluation, marketing, and administrative costs may be recovered through the CIP ratemaking process if the costs are approved by the Department as part of CIP and provided a utility demonstrates that its participation in CIP does not result in double recovery of ratepayer funds. This finding does not extend to electric utility infrastructure projects governed by Minnesota Statutes section 216B.1636."

The July 16, 2013, MPUC Order is consistent with Minn. Stat. § 216B.241 Subd. 2b.

Recovery of expenses, which states,

“The commission shall allow a utility to recover expenses resulting from a conservation improvements program required by the department and contributions and assessments to the energy and conservation account, unless the recovery would be inconsistent with a financial incentive proposal approved by the commission.”

The above referenced Commission Order and associated statutory language provide Otter Tail the ability to participate in CIP and recover costs associated with CIP programs approved by the Department. The Street Lighting project’s net benefits do not impact the Company’s CIP financial incentive, so associated expenses should be allowed recovery through the CIP tracker account.

For this project Otter Tail proposes to use the CIP account tracker to recover a portion of the project expenses. These recovery expenses are associated with the following four areas:

1. CIP rebates paid to the Company
2. Administrative expenses associated with administering the LED program
3. Retirement and Disposal costs of existing HID fixtures
4. Non-depreciated net-value of HID fixtures

The total cost of the five-year program is estimated at \$10 million. The five-year program will require nearly \$1.6 million in capital from Otter Tail each year, for a total capital investment estimated at \$7.9 million. As included in Otter Tail’s CIP Triennial filing, Otter Tail plans to pay itself a rebate based on the energy savings through CIP at the same level we pay our customers rebates through the Lighting Retrofit program. Otter Tail projects nearly 4,000 fixtures replaced each year with associated savings of 2.2 million kWh annually. Otter Tail estimates total annual rebates of approximately \$178,572, with total rebates over the five-year program approximately \$892,859, charged to the CIP tracker. The proposed rebates paid to Otter Tail are a small part of the overall project costs, but are critical to ensure Otter Tail can maintain the existing revenue requirement for the new LEDs. All CIP rebates paid to Otter Tail will reduce the capital costs of the lights being added to Otter Tail’s rate base. Otter Tail will not be using the CIP tracker account to recover any capital costs associated with materials or installation labor of the LEDs.

In Otter Tail’s CIP Triennial filing, Otter Tail proposed to recover administrative costs and all costs of removing and disposing of the old fixtures through the CIP tracker account. Otter

Tail is estimating ten percent of the project’s labor and materials cost to be Administration costs at \$164,460 annually. Otter Tail utilized its work order estimating system to estimate the retirement of the existing HID lamps. These retirement costs are estimated at \$229,148 annually. In addition, Otter Tail estimates \$203,523 annually for proper disposal of the old fixtures which contain hazardous materials. Otter Tail does not believe the retired materials will provide any salvage value, but if salvage value exists, disposal expenses will be reduced by the associated salvage value.

Otter Tail also proposes to recover the non-depreciated net value of the existing lights contained in the associated lighting FERC asset accounts through the CIP tracker account. As the existing lighting fixtures are retired, entries will be recorded to reduce the associated FERC asset accounts. Over the five-year life of the program, Otter Tail estimates \$2.62 million will be moved to the CIP tracker account from the associated lighting FERC asset accounts.

Table 4 below, lists the FERC accounts and their corresponding Minnesota Jurisdiction balances (net of accumulated depreciation) as of November 30, 2016.

Table 4

FERC Account	Balance
Street Lighting 373	\$1,044,550
Area Lighting, 371.2	\$1,503,147
Lighting in Other Asset Accounts	\$77,360
Total:	\$2,625,057

Otter Tail believes the use of the CIP account tracker to recover non-depreciated costs, administrative costs, retirement costs, and disposal costs are supported by a previous Commissioner decision. In 1991, Otter Tail proposed a similar plan through CIP, to retire existing inefficient lighting and install the current HID lighting. On August 8, 1991, the Department of Public Service approved Otter Tail’s 1991 CIP Plan, in Docket No. E017/CIP-90-552. In decision point three, Commissioner Krista L. Sanda stated, “The Company’s Street Lighting Project is approved with a budget of \$85,808 in 1991.”

The Commissioner provided background to the decision on page nine of her comments,

“Department Staff believe that the Street Lighting Project will be successful in conserving energy, while providing more light to community streets. However, Department Staff found that OTP’s proposed budget contained costs that were

already recovered through tariffed rates. Department Staff recommend that the Commissioner include in the CIP budget only the undepreciated balance on the replaced equipment, the incremental costs of installing HSP-9 lamps and fixtures, and administrative expenses. Thus, Department Staff recommend a revised budget of 85,808 for this project in 1991.”

All costs proposed to be recovered through the CIP tracker account, other than the non-depreciated net value, are not recovered through tariffed rates. The non-depreciated net value of the existing HID lights is recovered through existing tariffs, but when each light is retired it will be replaced by a new LED light at a higher capital cost which ensures there is no double recovery. All proposed costs recovered through the CIP tracker account are attributable to driving cost-effective energy savings. Further, Otter Tail is not proposing any change to revenue requirements through this filing.

Each year, Otter Tail files its annual Demand Side Management Financial Incentive Project and Update to the CIP Rider report with the MPUC. In the annual filing, Otter Tail requests approval of the CIP financial performance incentive amount, approval of updates to the CIP Rider, and approval of the CIP tracker account balance. Going forward, each year through the annual CIP filing the MPUC will have another opportunity to review all charges to the CIP tracker account. In this filing today, Otter Tail requests the MPUC’s support of the recovery of the non-depreciated net value, CIP rebate expenses, administrative expenses, retirement expenses, and disposal expenses through the CIP tracker account.

The estimated capital investment from Otter Tail is \$7.9 million, with proposed recovery of some expenses through the CIP account tracker estimated at \$6.5 million over the five-year project period. Table 5 below, shows the capital investment, the partial expense recovery through the CIP account tracker, and the net capital investment by Otter Tail. Overall, Otter Tail is making over a \$3.5 million net investment into the electric distribution system, which will be requested for recovery in a future general rate case filing.

Table 5

		2017 Year 1	2018 Year 2	2019 Year 3	2020 Year 4	2021 Year 5	5 Year Total
	Installation Labor and Fixture Costs	\$1,415,885	\$1,415,885	\$1,415,885	\$1,415,885	\$1,415,885	\$7,079,424
	Administrative Costs	\$164,460	\$164,460	\$164,460	\$164,460	\$164,460	\$822,301
A	Total Capital Investment	\$1,580,345	\$1,580,345	\$1,580,345	\$1,580,345	\$1,580,345	\$7,901,724
	Expense Recovery through CIP Account Tracker						
	Retirement Expense	\$229,217	\$229,217	\$229,217	\$229,217	\$229,217	\$1,146,087
	Disposal of Material Expense	\$203,585	\$203,585	\$203,585	\$203,585	\$203,585	\$1,017,927
	CIP Program Evaluation	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$15,000
	Reductions to Capital Investment						
B	CIP Rebate	\$178,572	\$178,572	\$178,572	\$178,572	\$178,572	\$892,859
C	Non-Deprec. Asset Balance Recovery	\$525,011	\$525,011	\$525,011	\$525,011	\$525,011	\$2,625,057
D	Administrative Recovery	\$164,460	\$164,460	\$164,460	\$164,460	\$164,460	\$822,301
	Total Recovery through CIP Tracker	\$1,303,846	\$1,303,846	\$1,303,846	\$1,303,846	\$1,303,846	\$6,519,230
	Net Capital Investment (A-B-C-D)	\$712,302	\$712,302	\$712,302	\$712,302	\$712,302	\$3,561,508

In Otter Tail's 2017-2019 CIP Triennial filing, Docket No. E017/CIP-16-116, Otter Tail proposed a budget of \$1,102,309 annually for this project to be expensed to the CIP tracker account. As shown in Table 5 Otter Tail has revised this annual budget to \$1,303,846. The proposed budget increase of \$201,537 is mostly from due to the omission of retirement expenses in the CIP 2017-2019 Triennial filing. Table 6 below, shows the changes for each item proposed to be recovered through the CIP tracker mechanism.

Table 6

	Approved CIP Filing CIP-116-116	Proposed LED Rate Filing	Change
CIP Rebates	\$181,268	\$178,572	-\$2,696
Administrative Labor Costs	\$141,410	\$164,460	\$23,050
Retirement and Disposal Costs	\$239,631	\$432,803	\$193,172
Non-Deprec. Asset Balance Recovery	\$537,000	\$525,011	-\$11,989
CIP Program Evaluation	\$3,000	\$3,000	\$0
Proposed CIP Tracker Expenses	\$1,102,309	\$1,303,846	\$201,537

The change in the lighting manufacturer slightly changed some of the lighting wattages which decreased the rebates paid to Otter Tail by \$2,696. Inclusion of the Retirement costs increased the Administrative Costs by \$23,050 since Administrative costs are based on ten

percent of the material and labor costs for construction and retirement. Estimated Retirement and Disposal costs increased by \$193,172. The Non-Depreciated Asset Balance Recovery costs based on the FERC lighting account balances has decreased by \$11,989 since Otter Tail's June 1, 2016 CIP Triennial filing. Estimates for program evaluation remain the same at \$3,000. Otter Tail plans to manage all estimated costs as much as possible to minimize impacts to customers.

Based on Otter Tail's latest program evaluation, with the new estimated project costs, the Societal test for 2017 produces \$1,175,835 in net benefits. The Societal benefit/cost test for 2017 is 2.05, the Total Resource test is 1.71, and the Utility test is 0.89. Otter Tail has a long history of administering CIP projects and is hopeful the final utility test is positive. Otter Tail will file this budget modification in Otter Tail's 2017-2019 CIP Triennial filing, Docket No. E017/CIP-16-116 seeking approval from Deputy Commissioner Grant of the DOC.

V. CONCLUSION

Otter Tail is responding to the request of many of its communities and customers by proposing the LED lighting rate schedule 11.07 and the overall LED lighting project. In order to have minimal impact on customer's rates and Otter Tail, it is essential Otter Tail is allowed partial recovery of the project costs with the remainder to be included in rates in a future proceeding. This project provides many customer benefits including; energy savings, minimal customer bill impacts, a modern aesthetically pleasing light, minimal light trespass, and conformity to city codes. Otter Tail is filing this proposal with the Minnesota Public Utility Commission (MPUC) requesting;

- Approve the proposed LED Street and Area Lighting rate schedule 11.07,
- Approve the closure to installations of its Outdoor Lighting Dusk to Dawn rate schedule 11.04, and
- Support of Otter Tail's plan to recover of a portion of the project costs through the CIP tracker account.

Dated: February 22, 2017

Respectfully submitted,

OTTER TAIL POWER COMPANY

By: /s/ JASON A. GRENIER

Jason A. Grenier

Manager, Market Planning

Otter Tail Power Company

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New & Existing Light Type	Annual Bill Quantity	Current Monthly Rate	Interim Rate	Rate Case Rate Proposed	LED Weighted Monthly rate (Interim)	LED Weighted Monthly rate (Rate Case) Proposed	LED Weighted Interim Rates Revenue	Rate Case Required Revenue
LED10	5,321.30				\$ 17.41	\$ 19.87	\$ 92,643.85	\$ 105,734.25
HPS23	4,813.23	\$ 16.03	\$ 17.56	\$ 20.01				
MH20	74.77	\$ 17.57	\$ 19.25	\$ 21.93				
MV11	329.08	\$ 13.28	\$ 14.55	\$ 16.57				
MV21	104.22	\$ 17.17	\$ 18.81	\$ 21.43				
LED13	1,914.64				\$ 21.80	\$ 24.85	\$ 41,739.18	\$ 47,578.83
HPS44	1,614.74	\$ 19.86	\$ 21.76	\$ 24.79				
MH110	32.46	\$ 36.80	\$ 40.32	\$ 45.93				
MH36	255.67	\$ 17.24	\$ 18.89	\$ 21.52				
MV35	-	\$ 25.87	\$ 28.34	\$ 32.29				\$ -
MV55	11.77	\$ 35.54	\$ 38.94	\$ 44.35				
LED20FLOOD	17,701.88				\$ 21.82	\$ 24.88	\$ 386,255.01	\$ 440,422.76
400 MV	47.31	\$ 17.17	\$ 18.81	\$ 21.43				
SIGN	189.06	\$ 15.41	\$ 16.88	\$ 19.23				
400 HPS	10,177.03	\$ 19.86	\$ 21.76	\$ 24.79				
400 MA	7,288.47	\$ 20.14	\$ 22.07	\$ 25.13				
LED30FLOOD	3,183.50				\$ 40.77	\$ 46.45	\$ 129,791.13	\$ 147,873.39
1M-HPSF	12.74	\$ 37.32	\$ 40.89	\$ 46.58				
1000-MV	94.25	\$ 33.76	\$ 36.99	\$ 42.13				
1000-MA	3,076.50	\$ 37.32	\$ 40.89	\$ 46.58				
LED3PT	4,378.26				\$ 10.41	\$ 11.88	\$ 45,577.67	\$ 52,013.71
HPS9PT	3,748.70	\$ 9.54	\$ 10.45	\$ 11.91				
MV6PT	629.55	\$ 9.27	\$ 10.16	\$ 11.57				
LED5	192,096.30				\$ 8.68	\$ 9.89	\$ 1,667,395.85	\$ 1,899,832.36
HPS14	6,550.81	\$ 12.25	\$ 13.42	\$ 15.29				
HPS9	149,931.27	\$ 7.90	\$ 8.66	\$ 9.86				
MH8	4,535.05	\$ 8.08	\$ 8.85	\$ 10.08				
MV6	31,079.17	\$ 7.10	\$ 7.78	\$ 8.86				
LED5PT	613.26				\$ 13.37	\$ 15.25	\$ 8,199.29	\$ 9,352.22
HPS14PT	589.46	\$ 12.23	\$ 13.40	\$ 15.26				
MH8PT	23.80	\$ 11.48	\$ 12.58	\$ 14.33				
LED8	4,359.82				\$ 15.55	\$ 17.73	\$ 67,795.13	\$ 77,299.53
HPS19	4,359.82	\$ 14.19	\$ 15.55	\$ 17.71				
MH14	-	\$ 15.39	\$ 16.86	\$ 19.21				
	229,568.95							
							\$ 2,439,397.10	\$ 2,780,107.05
UNDERGROUND QUANTITIES	194.00	\$2.12	\$2.32	\$2.65	5,407.18	\$ 6,162.41	\$ 5,407.18	\$ 6,162.41
							\$ 2,444,804.28	\$ 2,786,269.46
	0.65					2016 Forecasted Rev	Interim Forec. Rev	Rate Case Proposed Rev
						\$2,231,472	\$2,444,800.84	\$2,786,273.87
						Change from Rev. Requirement	Interim	Proposed
							\$ 3.44	\$ (4.41)

[illegible]

Company-owned Street and Area Lighting Project

Communities and Quantities

City	Ownership	Total
ALBERTA	OTP	60
ALEXANDRIA	OTP	109
AMIRET	OTP	14
ANGUS	OTP	10
APPLETON	OTP	318
ARGYLE	OTP	99
ASHBY	OTP	130
AUDUBON	OTP	114
BADGER	OTP	126
BARRETT	OTP	110
BARRY	OTP	13
BATTLE LAKE	OTP	455
BEARDSLEY	OTP	82
BEJOU	OTP	32
BELLINGHAM	OTP	72
BELTRAMI	OTP	67
BEMIDJI	OTP	1,889
BOYD	OTP	88
BRANDON	OTP	151
BRECKENRIDGE	OTP	4
BROOKS	OTP	49
BROWNS VALLEY	OTP	167
CALLAWAY	OTP	59
CAMPBELL	OTP	72
CANBY	OTP	294
CARLOS	OTP	91
CASS LAKE	OTP	376
CHOKIO	OTP	100
CLEARBROOK	OTP	105
CLIMAX	OTP	76
CLINTON	OTP	116
CLITHERALL	OTP	81
CLONTARF	OTP	53
CORRELL	OTP	22
CROOKSTON	OTP	889
CYRUS	OTP	71
DALTON	OTP	70
DANVERS	OTP	41
DAWSON	OTP	376

City	Ownership	Total
DEER CREEK	OTP	80
DEGRAFF	OTP	54
DENT	OTP	51
DETROIT LAKES	OTP	92
DONALDSON	OTP	24
DONNELLY	OTP	71
DORAN	OTP	22
DUDLEY	OTP	3
DUMONT	OTP	35
EAGLE BEND	OTP	8
ELBOW LAKE	OTP	10
ELDRED	OTP	4
ELIZABETH	OTP	65
ERDAHL	OTP	7
ERHARD	OTP	55
ERSKINE	OTP	158
EVANSVILLE	OTP	120
FARWELL	OTP	32
FERGUS FALLS	OTP	1,661
FERTILE	OTP	207
FISHER	OTP	69
FORADA	OTP	43
FOXHOME	OTP	65
FRAZEE	OTP	238
GARFIELD	OTP	77
GARY	OTP	68
GENTILLY	OTP	13
GHENT	OTP	60
GONVICK	OTP	87
GRACEVILLE	OTP	172
GREEN VALLEY	OTP	19
GREENBUSH	OTP	186
GULLY	OTP	39
HALLOCK	OTP	194
HALMA	OTP	32
HANCOCK	OTP	146
HENDRICKS	OTP	115
HENNING	OTP	46
HERMAN	OTP	129

Company-owned Street and Area Lighting Project

Communities and Quantities

City	Ownership	Total
HITTERDAL	OTP	65
HOFFMAN	OTP	154
HOLLOWAY	OTP	71
HOLMES CITY	OTP	14
HOLT	OTP	27
HUMBOLDT	OTP	25
IVANHOE	OTP	30
JOHNSON	OTP	30
KARLSTAD	OTP	192
KENNEDY	OTP	84
KENSINGTON	OTP	98
KENT	OTP	43
KERKHOVEN	OTP	165
LAC QUI PARLE	OTP	2
LAKE BENTON	OTP	125
LAKE BRONSON	OTP	79
LAKE PARK	OTP	5
LANCASTER	OTP	126
LOUISBURG	OTP	36
MADISON	OTP	31
MAHNOMEN	OTP	246
MARIETTA	OTP	88
MARSHALL	OTP	23
MCINTOSH	OTP	121
MELBY	OTP	11
MENTOR	OTP	137
MIDDLE RIVER	OTP	76
MILAN	OTP	68
MILLERVILLE	OTP	32
MILROY	OTP	63
MILTONA	OTP	112
MINNEOTA	OTP	185
MORRIS	OTP	799
MURDOCK	OTP	74
NASHUA	OTP	25
NASSAU	OTP	18
NEW YORK MILLS	OTP	314
NEWFOLDEN	OTP	5
NORCROSS	OTP	39

City	Ownership	Total
NORTHCOTE	OTP	2
NOYES	OTP	2
ODESSA	OTP	49
OGEMA	OTP	64
OKLEE	OTP	75
OSLO	OTP	74
OTTERTAIL	OTP	315
PARKERS PRAIRIE	OTP	224
PELICAN RAPIDS	OTP	295
PENNOCK	OTP	100
PERHAM	OTP	610
PLUMMER	OTP	85
PORTER	OTP	65
RED LAKE FALLS	OTP	251
RICHVILLE	OTP	36
ROSE CITY	OTP	12
ROTHSAY	OTP	108
SAINT HILAIRE	OTP	48
SAINT LEO	OTP	17
SAINT VINCENT	OTP	42
SHEVLIN	OTP	62
SOLWAY	OTP	35
STEPHEN	OTP	3
STRANDQUIST	OTP	38
SUNBURG	OTP	51
TAUNTON	OTP	42
TENNEY	OTP	6
TINTAH	OTP	29
TRAIL	OTP	20
TWIN VALLEY	OTP	179
ULEN	OTP	89
UNDERWOOD	OTP	96
URBANK	OTP	27
VERDI	OTP	11
VERGAS	OTP	79
VIKING	OTP	36
VINING	OTP	47
WAUBUN	OTP	111
WENDELL	OTP	59

Company-owned Street and Area Lighting Project

Communities and Quantities

City	Ownership	Total
WHEATON	OTP	271
WHITE EARTH	OTP	80
WILNO	OTP	5
WILTON	OTP	62
WINGER	OTP	94
	Total	19,452

Line No. 1	Fixture Type	FIBERG LASS STANDA RDS FS18	FIBERG LASS STANDA RDS FS23	ALUMINUM ALLOY STANDARDS 30'	ALUMINUM ALLOY STANDARDS 40'	STANDARD POLE (LED5, LED8 & LED10)	STANDARD POLE (LED13 & LED20 FLOOD)	STANDAR D POLE (LED30 FLOOD)
2	Calculated Fixture Life (yrs.)	50.00	50.00	50.00	50.00	50.00	50.00	50.00
3	Pole Cost	\$330.06	\$464.32	\$1,519.90	\$1,772.71	\$224.00	\$320.15	\$670.30
4	Pole Labor	\$105.21	\$105.21	\$351.42	\$351.42	\$351.42	\$395.10	\$439.28
5	Bracket Cost					\$54.22	\$70.52	\$70.52
6	Hardware Cost			\$590.62	\$590.62	\$21.44	\$29.35	\$29.35
7	Hardware Labor			\$71.45	\$71.45	\$0.00	\$0.00	\$0.00
8	(Other) Conductor Cost	\$69.12	\$69.12	\$131.33	\$131.33	\$55.14	\$55.14	\$55.14
9	Vibratory Plowing \$1.75/ft. (Other) Conductor Labor	\$262.50	\$262.50	\$314.41	\$319.47	\$115.50	\$115.50	\$115.50

Facilities and O&M Related Costs				LED5	LED10	LED3PT	LED5PT	LED8	LED13	LED20 FLOOD	LED30 FLOOD	SECURITY LIGHT (OPEN BOTTOM) LED5
(1)	Marginal Investment per fixture (all costs and labor)		Input-Lighting Cost workpapers	\$268.37	\$399.58	\$552.41	\$586.58	\$317.57	\$440.58	\$975.83	\$1,180.84	\$1,100.73
(2)	With General Plant Loading		(1) x 1.0130	\$271.86	\$404.77	\$559.59	\$594.21	\$321.70	\$446.31	\$988.52	\$1,196.19	\$1,115.04
(3)	Annual Economic Carrying Charge Related to Capital Investment	(9)	Input - Marginal Cost Study T29 P5	9.49%	9.49%	9.49%	9.49%	9.49%	9.49%	9.49%	9.49%	9.49%
(4)	A&G Loading (plant-related)	(10)	Input - Marginal Cost Study T29 P5	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
(5)	Total Annual Carrying Charge		(3) + (4)	9.59%	9.59%	9.59%	9.59%	9.59%	9.59%	9.59%	9.59%	9.59%
(6)	Annualized Costs		(2) x (5)	\$26.06	\$38.81	\$53.65	\$56.97	\$30.84	\$42.79	\$94.77	\$114.68	\$106.90
(7)	Annual Lighting O&M Expenses		Input-Lighting Cost workpapers	\$11.76	\$11.76	\$11.76	\$11.76	\$11.76	\$11.76	\$11.76	\$11.76	\$0.00
(8)	With A&G Loading (non-plant related)		(7) x 1.1323 Input-Marginal Cost Study	\$13.32	\$13.32	\$13.32	\$13.32	\$13.32	\$13.32	\$13.32	\$13.32	\$0.00
(9)	Distribution Facilities Related Costs		(6) + (8)	\$39.38	\$52.12	\$66.97	\$70.28	\$44.16	\$56.11	\$108.09	\$128.00	\$106.90
	Working Capital											
(10)	Material and Supplies		(2) x 1.20%	\$3.26	\$4.86	\$6.72	\$7.13	\$3.86	\$5.36	\$11.86	\$14.35	\$13.38
(11)	Prepayments		(2) x 0.03%	\$0.08	\$0.12	\$0.17	\$0.18	\$0.10	\$0.13	\$0.30	\$0.36	\$0.33
(12)	Cash Working Capital Allowance		(8) x 6.67%	\$0.89	\$0.89	\$0.89	\$0.89	\$0.89	\$0.89	\$0.89	\$0.89	\$0.00
(13)	Total Working Capital		(10) + (11) + (12)	\$4.23	\$5.87	\$7.77	\$8.20	\$4.85	\$6.38	\$13.05	\$15.60	\$13.71
(14)	Revenue Requirement for Working Capital		(13) x 11.20%	\$0.47	\$0.66	\$0.87	\$0.92	\$0.54	\$0.71	\$1.46	\$1.75	\$1.54
(15)	Total Annual Marginal Distribution Facilities Related Costs		(9) + (14)	\$39.85	\$52.78	\$67.84	\$71.20	\$44.70	\$56.82	\$109.55	\$129.75	\$108.44
O&M - Meter, Customer Accounts Expenses, Customer Service												
(16)	Meter and CT O&M Expenses	(13)	Input - Marginal Cost Study T29 P5	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(17)	Customer Accounts Expenses	(14)	Input - Marginal Cost Study T29 P5	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39
(18)	Customer Service and Informational Expenses	(15)	Input - Marginal Cost Study T29 P5	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10
(19)	With A&G Loading (Non-plant Related)		[(16)+(17)+(18)] x 1.1323	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95
(20)	Customer-Related Costs		(6) + (12) + (16)	\$26.95	\$39.70	\$54.54	\$57.86	\$31.73	\$43.68	\$95.66	\$115.57	\$106.90
	Working Capital											
(21)	Materials and Supplies			\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(22)	Prepayments			\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(23)	Cash Working Capital		(19) x 6.67%	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26
(24)	Revenue Requirement for Working Capital		[(21)+(22)+(23)]x11.20%	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03
(25)	Total Annual Marginal Customer-Related Costs		(20) + (24)	\$26.98	\$39.73	\$54.57	\$57.89	\$31.76	\$43.71	\$95.69	\$115.60	\$106.93
(26)	Total Annual Marginal Facilities & Customer-Related Costs per fixture		(15) + (25)	\$66.84	\$92.51	\$122.40	\$129.09	\$76.46	\$100.53	\$205.24	\$245.35	\$215.37
(27)	Monthly Marginal Facilities & Customer-Related Costs per lighting fixture		(26) / 12	\$5.57	\$7.71	\$10.20	\$10.76	\$6.37	\$8.38	\$17.10	\$20.45	\$17.95
Energy Costs Calculation per Fixture												
(26)	Lighting fixture input (connected kW)		input - Mfg data	0.047	0.095	0.026	0.047	0.076	0.133	0.199	0.261	0.047
(27)	Monthly charge per connected l (Marginal KWH rate/4100/12month)		\$7.26 input Section 11.03, Rate Code 31-749	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26
(28)	Monthly kWh charge		(26 * 27)	\$0.34	\$0.69	\$0.19	\$0.34	\$0.55	\$0.97	\$1.44	\$1.89	\$0.34
Total Monthly Fixture Cost												
(29)	Monthly Marginal Cost per fixture (excluding monthly energy)	(27)		\$5.57	\$7.71	\$10.20	\$10.76	\$6.37	\$8.38	\$17.10	\$20.45	\$17.95
(30)	Monthly kWh charge	(28)		\$0.34	\$0.69	\$0.19	\$0.34	\$0.55	\$0.97	\$1.44	\$1.89	\$0.34
(30)	Total Monthly Pole Cost	(29)		\$9.53	\$9.53	\$8.89	\$10.45	\$9.53	\$11.43	\$11.43	\$16.00	\$9.53
(32)	Total Monthly Fixture Cost	(27) + (28)+(29)		\$15.44	\$17.93	\$19.28	\$21.55	\$16.45	\$20.77	\$29.98	\$38.34	\$27.82
Interim Rate as of 4/16/2016				----- (2016 Dollars per fixture) -----								

Facilities and O&M Related Costs				FIBERGLASS STANDARDS FS18	FIBERGLAS S STANDARD S FS23	ALUMINUM ALLOY STANDARDS 30"	ALUMINUM ALLOY STANDARDS40 "	STANDARD POLE (LED5, LED8 & LED10)	STANDARD POLE (LED13 & LED20 FLOOD)	STANDARD POLE (LED30 FLOOD)	FLOOD LIGHTING VISOR LED 20 FLOOD	FLOOD LIGHTING VISOR LED30 FLOOD
(1)	Marginal Investment per fixture (all costs and labor)		Input-Lighting Cost workpapers	\$766.89	\$901.15	\$2,979.13	\$3,237.00	\$821.72	\$985.76	\$1,380.09	\$65.23	\$118.94
(2)	With General Plant Loading		(1) x 1.0130	\$776.86	\$912.86	\$3,017.86	\$3,279.08	\$832.40	\$998.57	\$1,398.03	\$66.08	\$120.49
(3)	Annual Economic Carrying Charge Related to Capital Investment	(9)	Input - Marginal Cost Study T29 P5	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%
(4)	A&G Loading (plant-related)	(10)	Input - Marginal Cost Study T29 P5	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
(5)	Total Annual Carrying Charge		(3) + (4)	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%
(6)	Annualized Costs		(2) x (5)	\$52.81	\$62.05	\$205.14	\$222.90	\$56.58	\$67.88	\$95.03	\$4.49	\$8.19
(7)	Annual Lighting O&M Expenses		Input-Lighting Cost workpapers	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(8)	With A&G Loading (non-plant related)		(7) x 1.1323 Input-Marginal Cost Study	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(9)	Distribution Facilities Related Costs		(6) + (8)	\$52.81	\$62.05	\$205.14	\$222.90	\$56.58	\$67.88	\$95.03	\$4.49	\$8.19
	Working Capital											
(10)	Material and Supplies		(2) x 1.20%	\$9.32	\$10.95	\$36.21	\$39.35	\$9.99	\$11.98	\$16.78	\$0.79	\$1.45
(11)	Prepayments		(2) x 0.03%	\$0.23	\$0.27	\$0.91	\$0.98	\$0.25	\$0.30	\$0.42	\$0.02	\$0.04
(12)	Cash Working Capital Allowance		(8) x 6.67%	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(13)	Total Working Capital		(10) + (11) + (12)	\$9.56	\$11.23	\$37.12	\$40.33	\$10.24	\$12.28	\$17.20	\$0.81	\$1.48
(14)	Revenue Requirement for Working Capital		(13) x 11.20%	\$1.07	\$1.26	\$4.16	\$4.52	\$1.15	\$1.38	\$1.93	\$0.09	\$0.17
(15)	Total Annual Marginal Distribution Facilities Related Costs		(9) + (14)	\$53.88	\$63.31	\$209.30	\$227.42	\$57.73	\$69.25	\$96.96	\$4.58	\$8.36
O&M - Meter, Customer Accounts Expenses, Customer Service												
(16)	Meter and CT O&M Expenses	(13)	Input - Marginal Cost Study T29 P5	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(17)	Customer Accounts Expenses	(14)	Input - Marginal Cost Study T29 P5	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39
(18)	Customer Service and Informational Expenses	(15)	Input - Marginal Cost Study T29 P5	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10
(19)	With A&G Loading (Non-plant Related)		[(16)+(17)+(18)] x 1.1323	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95	\$3.95
(20)	Customer-Related Costs		(6) + (12) + (16)	\$52.81	\$62.05	\$205.14	\$222.90	\$56.58	\$67.88	\$95.03	\$4.49	\$8.19
	Working Capital											
(21)	Materials and Supplies			\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(22)	Prepayments			\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(23)	Cash Working Capital		(19) x 6.67%	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26	\$0.26
(24)	Revenue Requirement for Working Capital		[(21)+(22)+(23)]x11.20%	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03
(25)	Total Annual Marginal Customer-Related Costs		(20) + (24)	\$52.84	\$62.08	\$205.17	\$222.93	\$56.61	\$67.91	\$95.06	\$4.52	\$8.22
(26)	Total Annual Marginal Facilities & Customer-Related Costs per fixture		(15) + (25)	\$106.72	\$125.39	\$414.47	\$450.34	\$114.34	\$137.16	\$192.02	\$9.10	\$16.58
(27)	Monthly Marginal Facilities & Customer-Related Costs per lighting fixture		(26) / 12	\$8.89	\$10.45	\$34.54	\$37.53	\$9.53	\$11.43	\$16.00	\$0.76	\$1.38
Energy Costs Calculation per Fixture												
(26)	Lighting fixture input (connected kW)		input - Mfg data	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(27)	Monthly charge per connected l (Marginal KWH rate/4100/12month)		\$7.26 input Section 11.03, Rate Code 31-749	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26	\$7.26
(28)	Monthly kWh charge		(26 * 27)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Monthly Fixture Cost												
(29)	Monthly Marginal Cost per fixture (excluding monthly energy)	(27)		\$8.89	\$10.45	\$34.54	\$37.53	\$9.53	\$11.43	\$16.00	\$0.76	\$1.38
(30)	Monthly kWh charge	(28)		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
(30)	Total Monthly Pole Cost	(29)										
(32)	Total Monthly Fixture Cost	(27) + (28)+(29)		\$8.89	\$10.45	\$34.54	\$37.53	\$9.53	\$11.43	\$16.00	\$0.76	\$1.38
Interim Rate as of 4/16/2016												

Attachment F
Street & Area Lighting
LED 5, 8, 10, 13

Post-Top Decorative Lighting
LED 3PT, 5PT

Flood Full & Upper/Lower Visor
LED 20, 30

Street & Area Lighting

LED 5 (ATBSF)

5,175 lumens

LED 8 (ATBSI)

9,003 lumens



Consistent with LEED® goals
& Green Globes™ criteria
for light pollution reduction

Autobahn Series ATBS

Roadway & Security Lighting

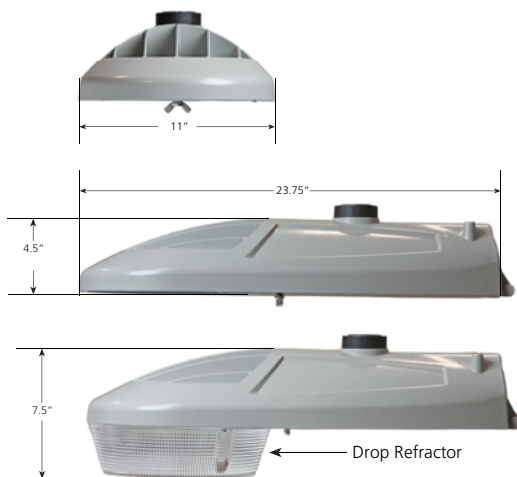
PRODUCT OVERVIEW



Applications:

Residential streets
Parking lots
General security lighting

DIMENSIONS



Effective Projected Area (EPA) The EPA for the ATBS is 0.3 sq. ft.,
Approx. Wt. = 12 lbs. (5 kg)

Features:

OPTICAL

Same Light: Performance is comparable to 50W – 150W HPS and up to 175W Mercury Vapor roadway and security lighting luminaires.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, and V roadway distributions. When used with the optional acrylic refractor the unit provides approximately 10% uplight and increased vertical foot-candles

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Three different surge protection options provide a minimum of IEEE/ANSI C62.41 Category C (10kV/5kA) protection.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt clamping mechanism provides 3G vibration rating per ANSI C136.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 5 pin and 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life)
Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life)

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

Autobahn Series ATBS

Roadway & Security Lighting

ORDERING INFORMATION

Example: ATBS A MVOLT R2

Series	Performance Packages	Voltage	Optics
ATBS Autobahn LED Roadway & Security	A 2,500 lumens B 3,200 lumens C 3,800 lumens E 4,700 lumens F 5,400 lumens G 6,100 lumens H 7,100 lumens I 8,500 lumens	MVOLT Multi-volt, 120-277V	R2 Roadway Type II R3 Roadway Type III R5 Roadway Type V D2 Type II, Drop Refractor included D3 Type III, Drop Refractor included D5 Type V, Drop Refractor included

Options		
<u>Color Temperature (CCT)</u> (Blank) 4000K CCT, 70 CRI Min. 3K 3000K CCT, 70 CRI Min. 5K 5000K CCT, 70 CRI Min. <u>Paint</u> Blank Gray (Standard) BK Black WH White BZ Bronze <u>Surge Protection</u> Standard 10kV/5kA SPD Blank Acuity SPD-10kV/5kA with inductive filter (Standard) MP MOV Pack IL SPD with Indicator Light <u>Misc.</u> HSS House Side Shield NL NEMA Label	XL Not CSA Certified <u>Controls</u> (Blank) 3 Pin NEMA Photocontrol Receptacle NR¹ No Photocontrol Receptacle DM² 0V-10V Dimmable Driver P5 5 Pin Photocontrol Receptacle (dimmable driver included) P7 7 Pin Photocontrol Receptacle (dimmable driver included) PCSS¹ DTL DSS Photocontrol PCL1¹ DTL DLL Photocontrol 120-277V AO Field Adjustable Output SH Shorting Cap <u>Install Packages</u> PKGS DTL DSS Photocontrol PKGL DTL DLL Photocontrol Packages ship with selected photocontrol, 24", 1 1/4" diameter arm, 5' of prewire and mounting hardware	<u>Accessories</u> ATBSREF Drop Refractor for field installation ATBSHSS House Side Shield for field installation ATBSLTS Light Trespass Shield for field installation

Notes

- Not available with Install Packages.
- Not available with AO option.



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
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Warranty Five-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

Autobahn Series ATBS

Roadway & Security Lighting

PERFORMANCE PACKAGE

Performance Package	Distribution	Lumens	Input Watts	LPW	50K Hours	LLD @ 25°C 75K Hours	100K Hours
A	R2	2,514	19	132	0.93	0.89	0.85
	R3	2,515		132			
	R5	2,649		139			
	D2	2,394		126			
	D3	2,372		125			
	D5	2,521		133			
B	R2	3,166	24	132	0.93	0.89	0.85
	R3	3,167		132			
	R5	3,336		139			
	D2	3,015		126			
	D3	2,988		124			
	D5	3,175		132			
C	R2	3,784	31	122	0.93	0.89	0.85
	R3	3,780		122			
	R5	4,029		130			
	D2	3,604		116			
	D3	3,566		115			
	D5	3,835		124			
E	R2	4,770	40	119	0.93	0.89	0.85
	R3	4,704		118			
	R5	4,867		122			
	D2	4,543		114			
	D3	4,438		111			
	D5	4,650		116			
F	R2	5,392	47	115	0.93	0.89	0.85
	R3	5,407		115			
	R5	5,175		110			
	D2	5,135		109			
	D3	5,101		109			
	D5	5,051		107			
G	R2	6,235	50	125	0.94	0.92	0.90
	R3	6,101		122			
	R5	6,404		128			
	D2	5,938		119			
	D3	5,756		115			
	D5	6,193		124			
H	R2	7,194	60	120	0.94	0.92	0.90
	R3	7,141		119			
	R5	7,508		125			
	D2	6,851		114			
	D3	6,737		112			
	D5	7,150		119			
I	R2	8,653	76	114	0.94	0.92	0.90
	R3	8,525		112			
	R5	9,003		118			
	D2	8,241		108			
	D3	8,042		106			
	D5	8,574		113			

Note: Information shown above is based on 4000K nominal system data. Individual fixture performance may vary. Specifications subject to change without notice.



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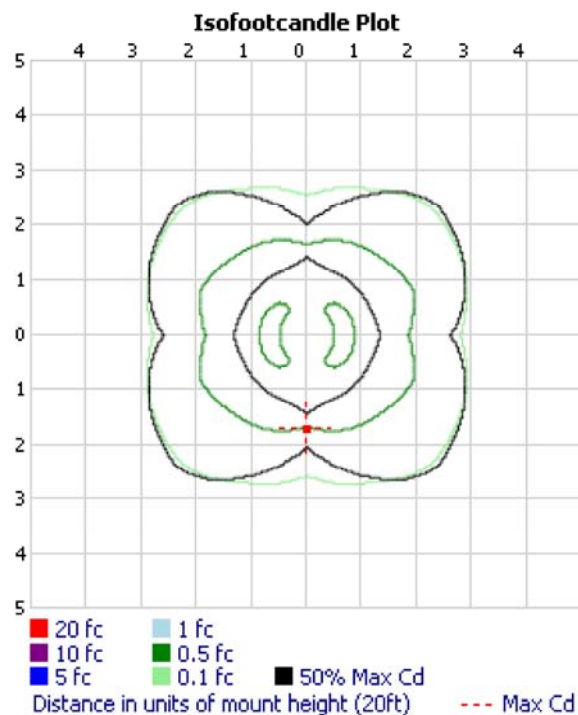
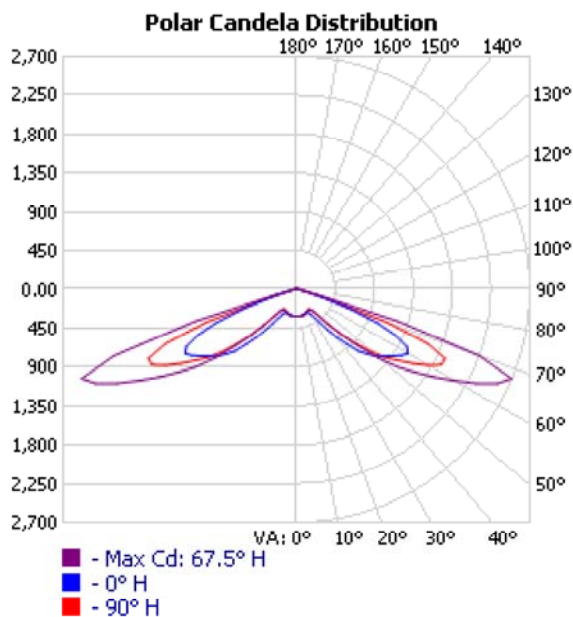
Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

OUTDOOR PHOTOMETRIC REPORT

CATALOG: ATBS F XXXXX R5

TEST #: 107409P30
 TEST LAB: SCALED PHOTOMETRY
 TEST NOTES: SCALED FROM ABSOLUTE TEST: 107409P0
 TEST DATE: 8/10/2016
 CATALOG: ATBS F XXXXX R5
 DESCRIPTION: ATBS F PERFORMANCE PACKAGE, 4000K COLOR TEMPERATURE, ROADWAY TYPE V DISTRIBUTION
 SERIES: AUTOBAHN ATBS
 LAMP CATALOG: LED
 LAMP: LED
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 5175.1, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 47
 LUMINOUS OPENING: CIRCULAR (DIA: 11.04")
 Max Cd: 2,691.2 AT HORIZONTAL: 67.5°, VERTICAL: 67.5°
 ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ATBS F XXXXX R5

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	250.3	4.8%
0-40	490.4	9.5%
0-60	2,577.3	49.8%
60-90	2,597.7	50.2%
70-100	624.4	12.1%
90-120	0.000	0%
0-90	5,175.1	100%
90-180	0.000	0%
0-180	5,175.1	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.8	0.6%	90-100	0.000	0%
10-20	85.8	1.7%	100-110	0.000	0%
20-30	134.8	2.6%	110-120	0.000	0%
30-40	240.0	4.6%	120-130	0.000	0%
40-50	676.5	13.1%	130-140	0.000	0%
50-60	1,410.4	27.3%	140-150	0.000	0%
60-70	1,973.3	38.1%	150-160	0.000	0%
70-80	608.1	11.7%	160-170	0.000	0%
80-90	16.4	0.3%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS	
Max Cd, 90 Deg Vert:	0.000	
Max Cd, 80 to <90 Deg:	39.3	
	Lumens	% Lamp
Downward Street Side:	2,587.5	50%
Downward House Side:	2,587.5	50%
Downward Total:	5,175.0	100%
Upward Street Side:	0.000	0%
Upward House Side:	0.000	0%
Upward Total:	0.000	0%
<hr/>		
Total Lumens:	5,175.0	100%

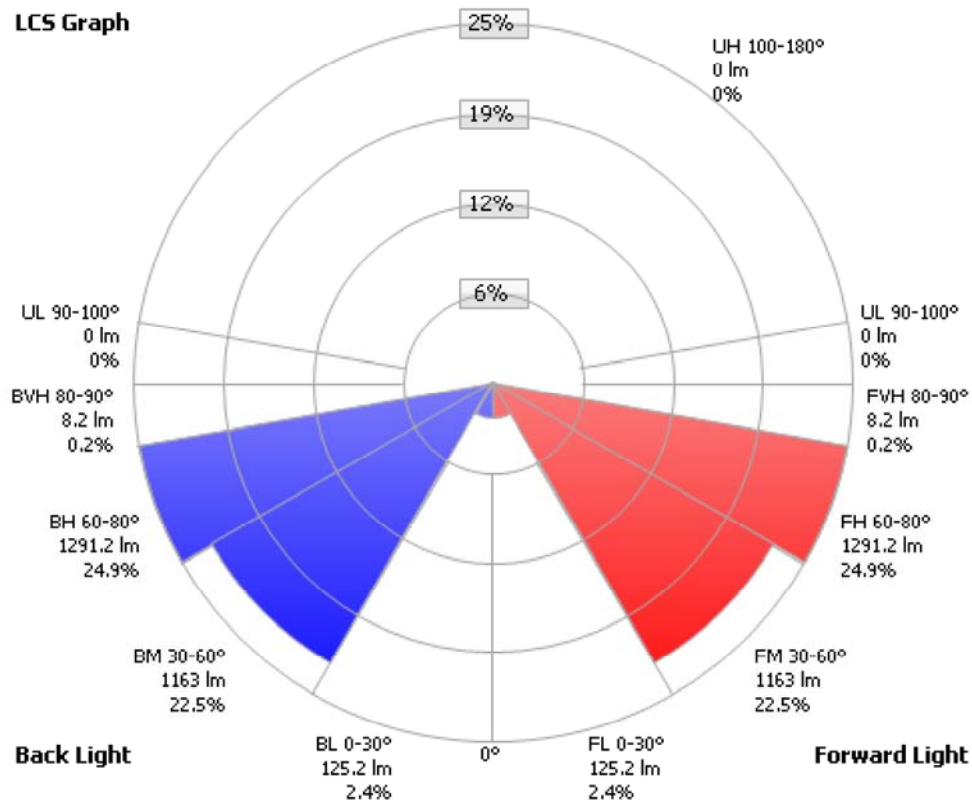
LCS TABLE

BUG RATING	B3 - U0 - G1
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	125.2 2.4%
Medium(30-60):	1,163.0 22.5%
High(60-80):	1,291.2 24.9%
Very High(80-90):	8.2 0.2%
BACK LIGHT	
Low(0-30):	125.2 2.4%
Medium(30-60):	1,163.0 22.5%
High(60-80):	1,291.2 24.9%
Very High(80-90):	8.2 0.2%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	0.1 0%

OUTDOOR PHOTOMETRIC REPORT
CATALOG: ATBS F XXXXX R5



LCS Graph



Back Light

Forward Light

Scale = Max LCS %

Trapped Light: 0.1lm, 0%



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PAGE 3 OF 4

OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ATBS F XXXXX R5



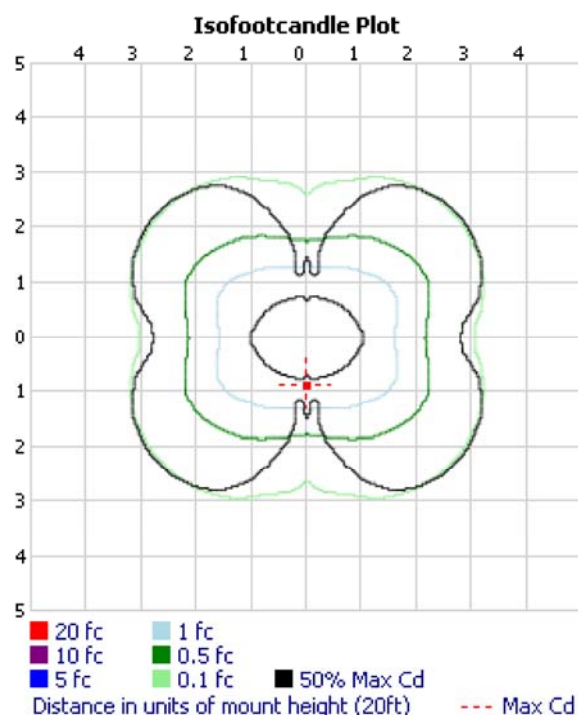
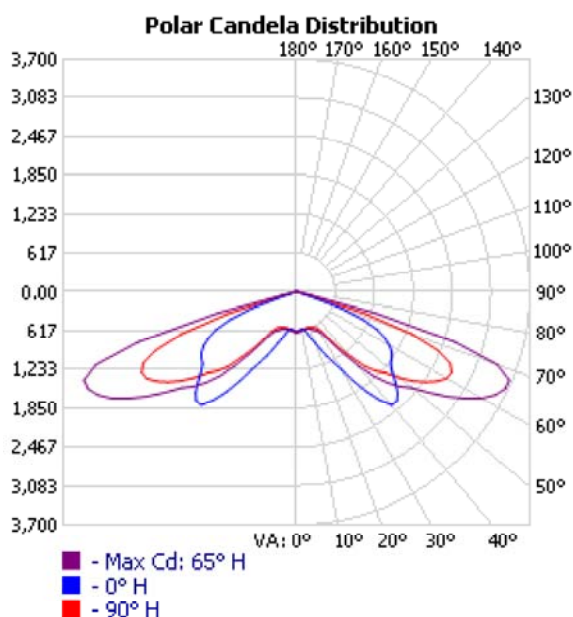
CANDELA TABLE - TYPE C

	0	22.5	45	67.5	90
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10	308	310	315	315	316
15	299	300	305	307	302
20	292	293	299	296	291
25	296	293	290	284	278
30	341	318	291	274	269
35	476	425	322	290	288
40	726	684	477	407	406
45	1013	935	845	759	751
50	1206	1273	1239	1237	1122
55	1344	1576	1616	1671	1434
60	1488	1869	1957	2106	1757
65	1268	1835	2259	2567	1896
70	652	1391	2631	2253	1118
75	110	236	578	244	78
80	25	34	39	32	32
85	10	12	15	15	15
90	0	0	0	0	0

OUTDOOR PHOTOMETRIC REPORT

CATALOG: ATBS I XXXXX R5

TEST #: ISF 29749P5
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 4/12/2016
 CATALOG: ATBS I XXXXX R5
 DESCRIPTION: ATBS I PERFORMANCE PACKAGE, 4000K COLOR TEMPERATURE, ROADWAY TYPE V DISTRIBUTION
 SERIES: AUTOBAHN ATBS
 LAMP CATALOG: LED
 LAMP: LED
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 9003.4, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 76
 LUMINOUS OPENING: CIRCULAR (DIA: 11.04")
 Max Cd: 3,650.1 AT HORIZONTAL: 65°, VERTICAL: 67.5°
 ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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ISF 29749P5
VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ATBS I XXXXX R5

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	604.0	6.7%
0-40	1,430.8	15.9%
0-60	5,164.9	57.4%
60-90	3,838.5	42.6%
70-100	1,166.6	13%
90-120	0.000	0%
0-90	9,003.4	100%
90-180	0.000	0%
0-180	9,003.4	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	58.5	0.6%	90-100	0.000	0%
10-20	180.4	2.0%	100-110	0.000	0%
20-30	365.1	4.1%	110-120	0.000	0%
30-40	826.7	9.2%	120-130	0.000	0%
40-50	1,569.5	17.4%	130-140	0.000	0%
50-60	2,164.6	24.0%	140-150	0.000	0%
60-70	2,671.9	29.7%	150-160	0.000	0%
70-80	1,139.8	12.7%	160-170	0.000	0%
80-90	26.8	0.3%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS
Max Cd, 90 Deg Vert:	0.000
Max Cd, 80 to <90 Deg:	109.6
	Lumens % Lamp
Downward Street Side:	4,501.5 50%
Downward House Side:	4,501.5 50%
Downward Total:	9,003.1 100%
Upward Street Side:	0.000 0%
Upward House Side:	0.000 0%
Upward Total:	0.000 0%
Total Lumens:	9,003.1 100%

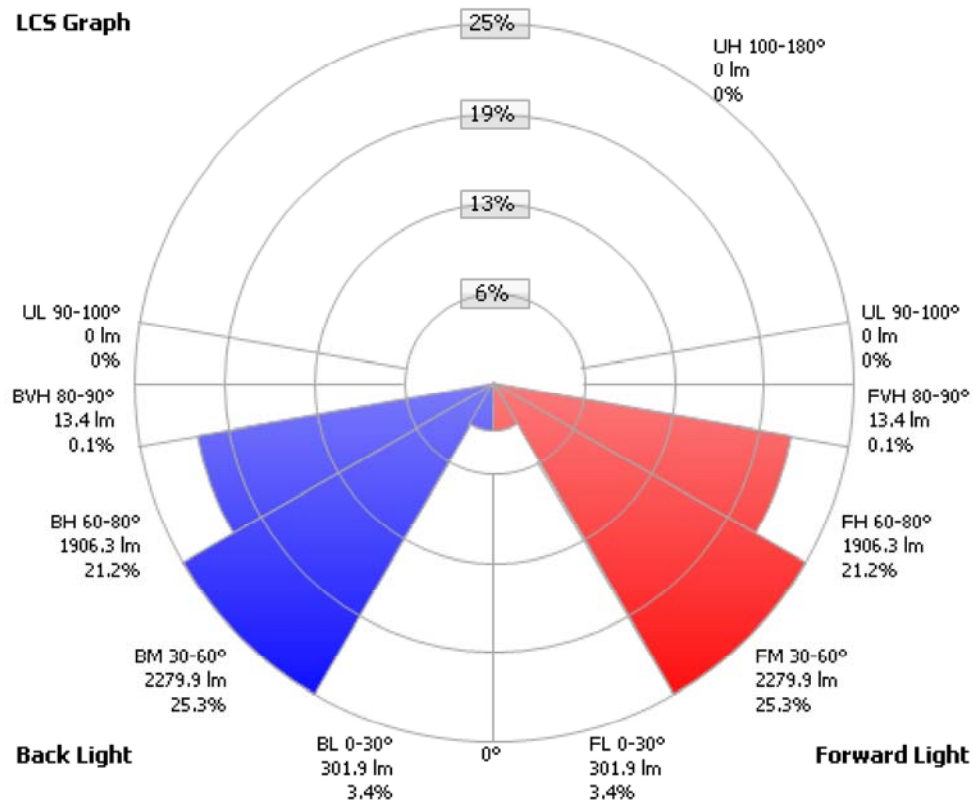
LCS TABLE

BUG RATING	B3 - U0 - G2
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	301.9 3.4%
Medium(30-60):	2,279.9 25.3%
High(60-80):	1,906.3 21.2%
Very High(80-90):	13.4 0.1%
BACK LIGHT	
Low(0-30):	301.9 3.4%
Medium(30-60):	2,279.9 25.3%
High(60-80):	1,906.3 21.2%
Very High(80-90):	13.4 0.1%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	0.3 0%

OUTDOOR PHOTOMETRIC REPORT
CATALOG: ATBS I XXXXX R5



LCS Graph



Back Light

Forward Light

Scale = Max LCS %

Trapped Light: 0.3lm, 0%



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OUTDOOR PHOTOMETRIC REPORT
CATALOG: ATBS I XXXXX R5



CANDELA TABLE - TYPE C

	0	5	15	25	35	45	55	65	75	85	90
0	629	629	629	629	629	629	629	629	629	629	629
5	602	618	619	614	618	618	621	622	621	619	619
10	596	612	607	607	604	605	605	604	601	601	600
15	686	658	654	649	638	622	608	599	594	589	589
20	866	767	761	739	715	674	640	617	604	598	595
25	1125	936	915	871	811	750	700	662	627	616	615
30	1425	1211	1159	1076	980	878	794	735	692	675	672
35	1940	1624	1595	1509	1380	1220	1096	1021	962	919	911
40	2353	2013	2021	2004	1956	1806	1642	1547	1451	1366	1354
45	2265	1977	2048	2133	2182	2189	2141	2041	1914	1794	1776
50	1982	1766	1892	2043	2204	2326	2403	2369	2269	2135	2120
55	1843	1772	1918	2128	2334	2519	2760	2901	2740	2530	2492
60	1702	1743	1956	2281	2598	2908	3280	3388	3116	2795	2746
65	1408	1570	1872	2345	2802	3192	3600	3648	3229	2734	2687
70	748	1111	1471	2102	2674	3072	3409	3386	2784	2005	1936
75	59	442	623	967	1281	1500	1497	1307	739	305	256
80	39	40	46	65	110	102	63	45	45	50	53
85	17	17	20	22	21	21	21	22	24	26	27
90	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0



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Street & Area Lighting

LED 10 (ATBMD)

12,387 lumens

LED 13 (ATBMF)

16,691 lumens



Consistent with LEED® goals
& Green Globes™ criteria
for light pollution reduction

Autobahn Series ATBM Roadway

PRODUCT OVERVIEW



Applications:

Residential streets
Parking lots
High speed roadways

Features:

OPTICAL

Same Light: Performance is comparable to 150W – 250W HPS

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, IV, & V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Three different surge protection options provide a minimum of IEEE/ANSI C62.41 Category C (10kV/5kA) protection.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt and optional 4 bolt clamping mechanism provide 3G vibration rating per ANSI C136.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 5 pin and 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life)
Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life).

Extreme long life solid state locking-style photocontrol with on demand remote on/off control - PCCC (15 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

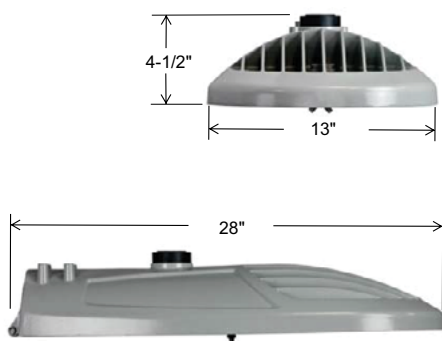
DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Rated for -40°C to 40°C ambient

CSA Certified to U.S. and Canadian standards

Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATBM is 0.3 sq. ft.,
Approx. Wt. = 21 lbs. (9.5 kg)

Autobahn Series ATBM

Roadway

ORDERING INFORMATION

Example: ATBM A MVOLT R2

Series	Performance Packages	Voltage	Optics	Mounting
ATBM Autobahn LED Roadway	A 7,000 lumens B 8,000 lumens C 9,000 lumens D 11,600 lumens E 13,400 lumens F 15,700 lumens G 16,600 lumens H 17,400 lumens	MVOLT Multi-volt, 120-277V 347 347V 480 480V	R2 Roadway Type II R3 Roadway Type III R4 Roadway Type IV R5 Roadway Type V	(Blank) 2 Bolt Mounting 4B 4 Bolt Mounting

Options		Accessories	
<u>Color Temperature (CCT)</u> (Blank) 4000K CCT, 70 CRI Min. 3K 3000K CCT, 70 CRI Min. 5K 5000K CCT, 70 CRI Min.		ATBMHSS House Side Shield ATBMLTS Light Trespass Shield RKATBMMVOLTSPD ATBM Acuity SPD Replacement Kit MVOLT RKATBMHVSPD ATBM Acuity SPD Replacement Kit 347/480V RKATBMMVOLTMP ATBM MOV Pack Replacement Kit RKATBMMVOLTIL ATBM IL SPD Replacement Kit	
<u>Paint</u> (Blank) Gray BK Black BZ Bronze DDB Dark Bronze GI Graphite WH White		<u>Control Options</u> (Blank) 3 Pin NEMA Photocontrol Receptacle P5 5 Pin Photocontrol Receptacle (dimmable driver included) ² P7 7 Pin Photocontrol Receptacle (dimmable driver included) ² NR No Photocontrol Receptacle ³ AO Field Adjustable Output ⁴ DM 0-10V Dimmable Driver ⁵ PCSS Solid-State Lighting Photocontrol ⁶ PCLL Solid-State Long Life Photocontrol PCCC Solid-State Long Life Photocontrol with remote control on/off ⁷ SH Shorting Cap	
<u>Surge Protection</u> (Blank) Acuity SPD MP MOV Pack ¹ IL SPD with Indicator Light ¹		<u>Packages</u> (Blank) Standard Pack JP Job Pack (36/pallet)	
<u>Miscellaneous Options</u> HSS House Side Shield NL NEMA Label Indicating Wattage XL Not CSA Certified – No Terminal Block Cover			

Notes:

- 1 Not available with G and H performance packages
- 2 Dimmable Driver included. Not available with AO, DM or NR
- 3 Not available with P5, P7
- 4 Not available with DM, P5 or P7
- 5 Controls by others. Not available with AO
- 6 MVOLT only
- 7 Not available with PCSS or PCLL



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
www.americanelectriclighting.com

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Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
 Actual performance may differ as a result of end-user environment and application.
 Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

ATBM

Autobahn Series ATBM

Roadway

PERFORMANCE PACKAGE

Performance Package	Distribution	4000 K CCT			LLD @ 25°C		
		Lumens	Input Watts	LPW	50K Hours	75K Hours	100K Hours
A	R2	7,114	60	118	89	84	80
	R3	7,024		117			
	R4	6,958		116			
	R5	7,469		124			
B	R2	8,090	70	115	89	84	80
	R3	8,016		114			
	R4	7,924		113			
	R5	8528		121			
C	R2	9031	81	112	89	84	80
	R3	8,942		111			
	R4	8,827		110			
	R5	9,517		118			
D	R2	11,769	95	124	90	87	84
	R3	11,690		123			
	R4	11,534		121			
	R5	12,388		130			
E	R2	13,601	115	118	90	87	84
	R3	13,416		117			
	R4	13,323		116			
	R5	14,263		124			
F	R2	15,932	133	120	90	86	83
	R3	15,741		118			
	R4	15,476		116			
	R5	16,691		125			
G	R2	17,102	150	114	90	86	83
	R3	16,974		113			
	R4	16,635		111			
	R5	17,938		119			
H	R2	18,085	164	111	90	86	83
	R3	17,929		110			
	R4	17,439		107			
	R5	18,966		116			

Note: Information shown above is based on 4000K nominal system data. Individual fixture performance may vary. Specifications subject to change without notice.



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Warranty Five-year limited warranty. Complete warranty terms located at:
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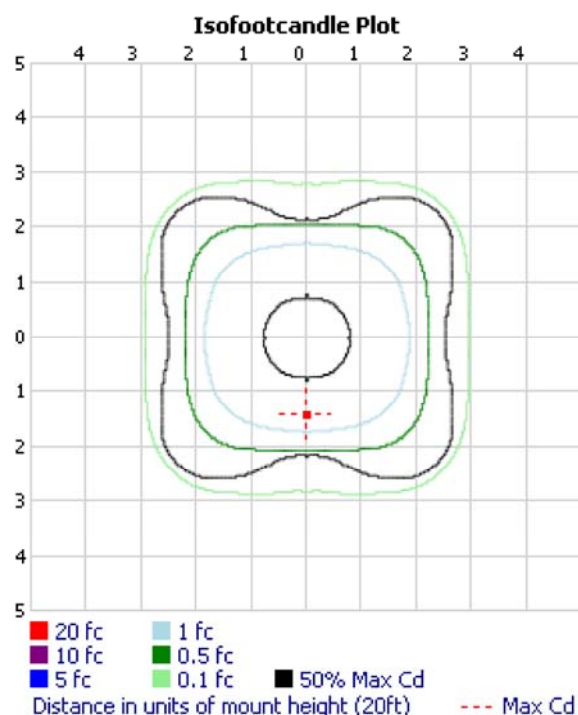
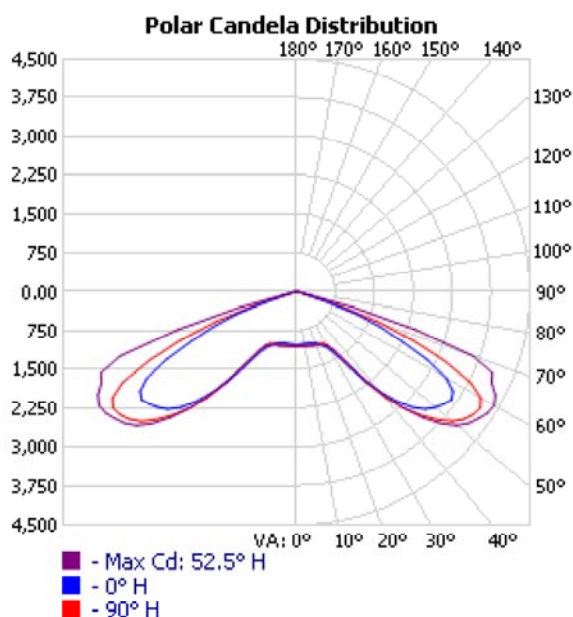
Please contact your sales representative for the latest product information.

ATBM

OUTDOOR PHOTOMETRIC REPORT

CATALOG: ATBM D XXXXX R5 XXXX

TEST #: LTL27442P2
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 4/6/2015
 CATALOG: ATBM D XXXXX R5 XXXX
 DESCRIPTION: ATBM D PERFORMANCE PACKAGE, 4000K COLOR TEMPERATURE, ROADWAY TYPE 5 DISTRIBUTION.
 SERIES: AUTOBAHN ATBM
 LAMP CATALOG: LED COB
 LAMP: LED COB
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 12387, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 95
 LUMINOUS OPENING: CIRCULAR (DIA: 12.72")
 Max Cd: 4,401.4 AT HORIZONTAL: 52.5°, VERTICAL: 60°
 ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

VISUAL PHOTOMETRIC TOOL 1.2.46 COPYRIGHT 2017, ACUITY BRANDS LIGHTING.

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OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ATBM D XXXXX R5 XXXX

ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	937.7	7.6%
0-40	2,104.3	17%
0-60	8,137.5	65.7%
60-90	4,249.5	34.3%
70-100	979.1	7.9%
90-120	0.000	0%
0-90	12,387.0	100%
90-180	0.000	0%
0-180	12,387.0	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	99.3	0.8%	90-100	0.000	0%
10-20	302.4	2.4%	100-110	0.000	0%
20-30	536.0	4.3%	110-120	0.000	0%
30-40	1,166.6	9.4%	120-130	0.000	0%
40-50	2,530.2	20.4%	130-140	0.000	0%
50-60	3,503.0	28.3%	140-150	0.000	0%
60-70	3,270.5	26.4%	150-160	0.000	0%
70-80	934.5	7.5%	160-170	0.000	0%
80-90	44.5	0.4%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS
Max Cd, 90 Deg Vert:	0.000
Max Cd, 80 to <90 Deg:	110.5
	Lumens % Lamp
Downward Street Side:	6,192.8 50%
Downward House Side:	6,192.8 50%
Downward Total:	12,385.6 100%
Upward Street Side:	0.000 0%
Upward House Side:	0.000 0%
Upward Total:	0.000 0%
Total Lumens:	12,385.6 100%

LCS TABLE

BUG RATING	B3 - U0 - G2
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	468.7 3.8%
Medium(30-60):	3,599.4 29.1%
High(60-80):	2,102.4 17%
Very High(80-90):	22.2 0.2%
BACK LIGHT	
Low(0-30):	468.7 3.8%
Medium(30-60):	3,599.4 29.1%
High(60-80):	2,102.4 17%
Very High(80-90):	22.2 0.2%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	1.4 0%

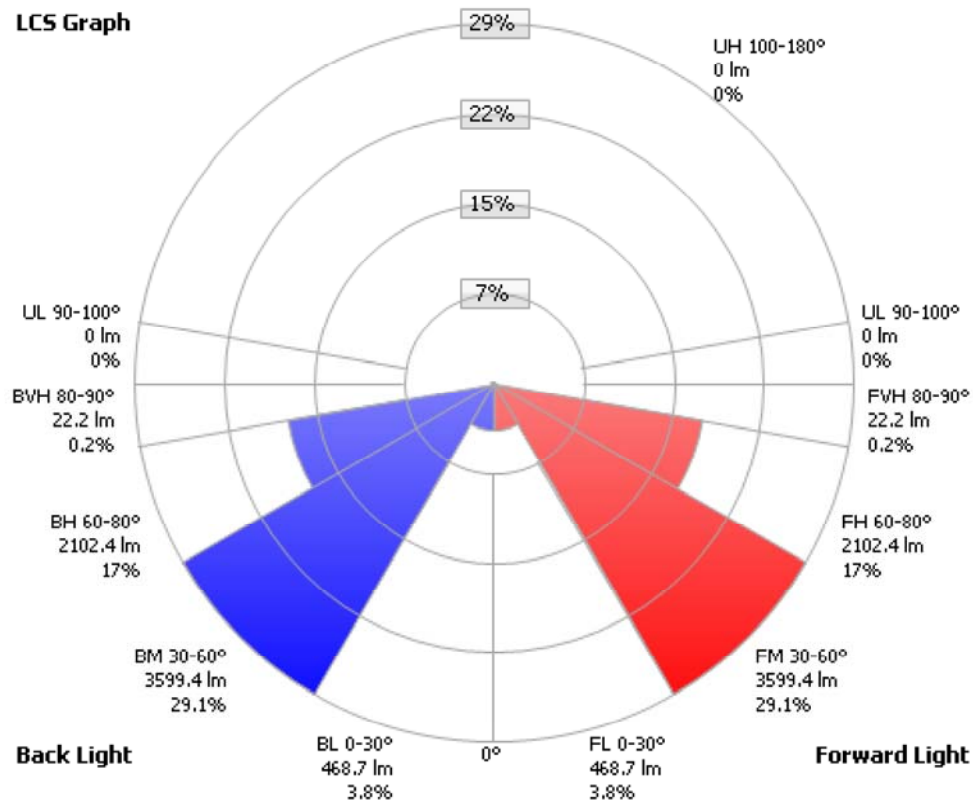

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LCS Graph



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CANDELA TABLE - TYPE C

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037	1037
5	1010	1034	1032	1029	1035	1048	1046	1041	1038	1035	1040	1050	1046	1045	1038	1022	1032	1047	1057
10	1012	1033	1036	1037	1045	1062	1059	1054	1051	1048	1053	1058	1048	1045	1035	1022	1031	1047	1058
15	1028	1060	1058	1057	1061	1073	1071	1069	1071	1066	1076	1085	1076	1067	1055	1040	1044	1055	1066
20	1054	1109	1106	1101	1103	1114	1106	1098	1093	1083	1088	1098	1092	1088	1074	1055	1060	1074	1088
25	1132	1205	1203	1195	1181	1180	1164	1151	1142	1123	1127	1135	1121	1112	1098	1088	1083	1088	1098
30	1288	1445	1436	1422	1383	1355	1315	1280	1243	1212	1211	1199	1174	1174	1167	1159	1178	1180	1189
35	1788	2081	2053	2011	1959	1909	1835	1767	1703	1635	1621	1614	1595	1595	1597	1608	1631	1686	1704
40	2534	2772	2729	2680	2610	2598	2567	2534	2515	2526	2573	2598	2553	2520	2487	2504	2531	2593	2675
45	3166	3257	3243	3219	3207	3254	3287	3306	3319	3351	3423	3446	3403	3341	3266	3264	3270	3316	3375
50	3482	3479	3473	3463	3464	3565	3668	3747	3836	3935	4014	4016	3914	3827	3758	3756	3774	3843	3907
55	3646	3606	3597	3579	3604	3734	3850	3958	4051	4156	4261	4266	4199	4104	4041	4042	4045	4098	4152
60	3339	3188	3229	3318	3465	3685	3882	4020	4121	4256	4376	4388	4288	4145	4057	4024	4014	4050	4098
65	2235	2236	2326	2509	2759	3091	3428	3730	3954	4107	4158	4135	3999	3765	3571	3406	3230	3135	3133
70	1212	1188	1354	1611	1923	2275	2742	3175	3523	3706	3701	3480	3067	2648	2338	2076	1857	1730	1653
75	190	205	261	364	489	566	876	1088	1271	1290	1190	1016	804	621	473	370	288	247	223
80	100	88	92	92	86	85	88	92	97	104	111	104	92	85	79	75	73	81	86
85	51	39	39	38	38	36	35	36	37	38	38	38	40	41	41	40	40	40	41
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



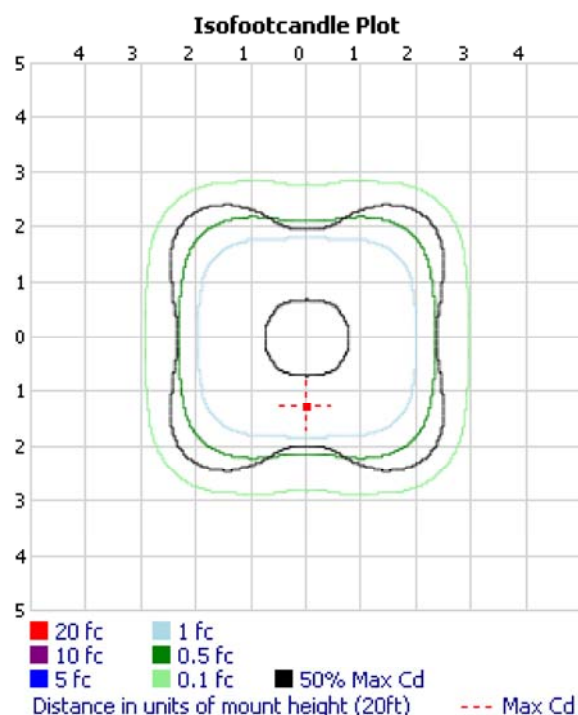
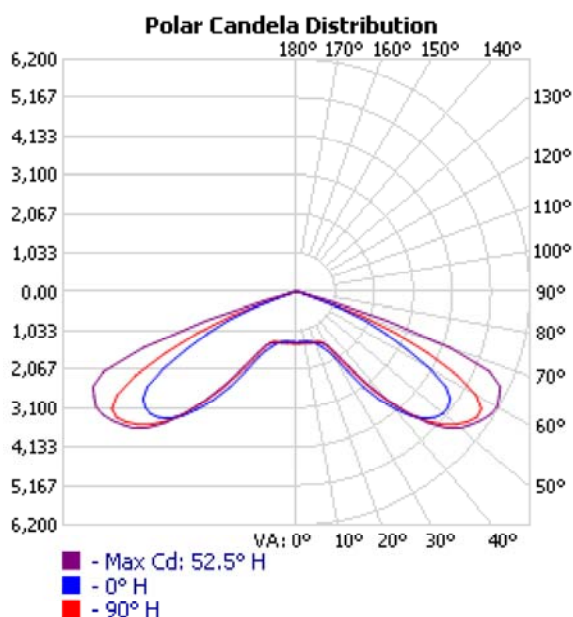
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OUTDOOR PHOTOMETRIC REPORT

CATALOG: ATBM F XXXXX R5 XXXX

TEST #: LTL27460P3
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 4/6/2015
 CATALOG: ATBM F XXXXX R5 XXXX
 DESCRIPTION: ATBM F PERFORMANCE PACKAGE, 4000K COLOR TEMPERATURE, ROADWAY TYPE 5 DISTRIBUTION.
 SERIES: AUTOBAHN ATBM
 LAMP CATALOG: LED COB
 LAMP: LED COB
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 16691.4, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 133
 LUMINOUS OPENING: CIRCULAR (DIA: 12.72")
 Max Cd: 6,150.8 AT HORIZONTAL: 52.5°, VERTICAL: 60°
 ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
CATALOG: ATBM F XXXXX R5 XXXX



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	1,260.4	7.6%
0-40	2,989.5	17.9%
0-60	11,429.7	68.5%
60-90	5,261.7	31.5%
70-100	992.0	5.9%
90-120	0.000	0%
0-90	16,691.4	100%
90-180	0.000	0%
0-180	16,691.4	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	129.8	0.8%	90-100	0.000	0%
10-20	398.2	2.4%	100-110	0.000	0%
20-30	732.4	4.4%	110-120	0.000	0%
30-40	1,729.1	10.4%	120-130	0.000	0%
40-50	3,604.7	21.6%	130-140	0.000	0%
50-60	4,835.5	29.0%	140-150	0.000	0%
60-70	4,269.7	25.6%	150-160	0.000	0%
70-80	938.5	5.6%	160-170	0.000	0%
80-90	53.5	0.3%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS
Max Cd, 90 Deg Vert:	0.000
Max Cd, 80 to <90 Deg:	135.8
	Lumens % Lamp
Downward Street Side:	8,344.9 50%
Downward House Side:	8,344.9 50%
Downward Total:	16,689.7 100%
Upward Street Side:	0.000 0%
Upward House Side:	0.000 0%
Upward Total:	0.000 0%
Total Lumens:	16,689.7 100%

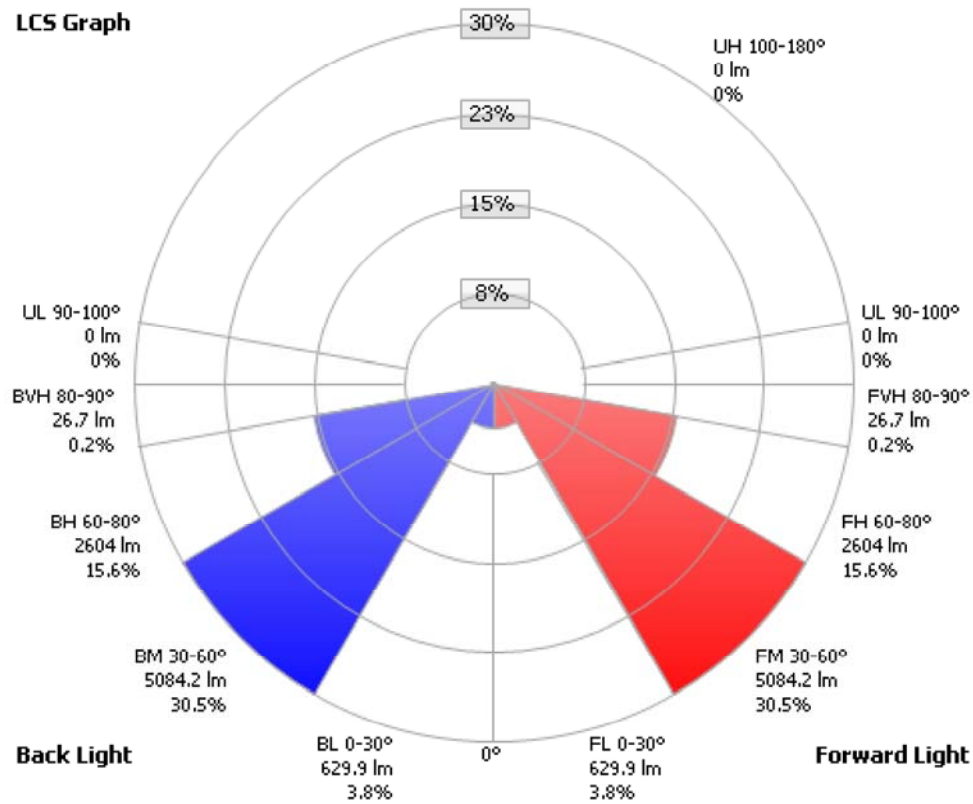
LCS TABLE

BUG RATING	B4 - U0 - G2
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	629.9 3.8%
Medium(30-60):	5,084.2 30.5%
High(60-80):	2,604.0 15.6%
Very High(80-90):	26.7 0.2%
BACK LIGHT	
Low(0-30):	629.9 3.8%
Medium(30-60):	5,084.2 30.5%
High(60-80):	2,604.0 15.6%
Very High(80-90):	26.7 0.2%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	1.7 0%

OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ATBM F XXXXX R5 XXXX



LCS Graph



Back Light

Forward Light

Scale = Max LCS %

Trapped Light: 1.7lm, 0%



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 VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
CATALOG: ATBM F XXXXX R5 XXXX



CANDELA TABLE - TYPE C

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358	1358
5	1325	1340	1344	1347	1344	1362	1376	1360	1348	1351	1355	1365	1363	1365	1349	1327	1343	1362	1373
10	1337	1347	1356	1363	1366	1385	1398	1381	1372	1373	1376	1381	1374	1374	1356	1334	1352	1373	1385
15	1368	1388	1391	1397	1393	1407	1421	1405	1398	1400	1405	1416	1414	1413	1386	1353	1360	1377	1388
20	1441	1485	1488	1488	1477	1484	1492	1463	1438	1432	1433	1440	1433	1437	1429	1403	1398	1409	1419
25	1624	1673	1667	1654	1618	1596	1588	1546	1516	1496	1497	1498	1484	1483	1457	1458	1460	1450	1460
30	2008	2159	2135	2098	2019	1956	1893	1794	1711	1660	1658	1631	1616	1640	1645	1659	1735	1753	1757
35	3110	3121	3086	3028	2927	2846	2785	2661	2544	2477	2448	2434	2423	2429	2416	2417	2473	2566	2620
40	4089	3981	3945	3890	3806	3787	3801	3717	3673	3686	3775	3764	3714	3669	3595	3598	3643	3763	3855
45	4777	4535	4509	4517	4504	4596	4725	4728	4735	4826	4953	4940	4873	4803	4677	4664	4700	4796	4882
50	5066	4795	4767	4772	4807	4954	5161	5248	5338	5509	5643	5650	5523	5428	5311	5297	5324	5427	5515
55	4983	4801	4778	4842	4944	5138	5392	5507	5594	5778	5954	5979	5870	5746	5646	5651	5665	5756	5842
60	4086	3939	4018	4234	4539	4901	5301	5552	5711	5924	6109	6130	5984	5781	5595	5493	5425	5438	5508
65	2622	2653	2823	3165	3603	4106	4680	5184	5566	5869	5998	5888	5571	5086	4688	4356	4048	3871	3849
70	1202	1145	1400	1761	2218	2677	3296	3848	4284	4488	4465	4131	3587	3039	2594	2276	2020	1864	1815
75	219	190	227	286	354	442	659	862	1072	1110	983	760	540	388	309	261	224	224	216
80	136	109	114	115	110	104	109	112	113	113	130	119	105	99	94	89	88	103	119
85	83	50	48	48	45	43	43	42	43	44	44	46	47	49	49	49	47	46	46
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Post-Top Decorative Lighting

LED 3PT (ARDCL10)

2,759 lumens

LED 5PT (ARDCL20)

5,404 lumens



American Revolution Deluxe Full Cutoff LED

Series ARDCL

PRODUCT OVERVIEW



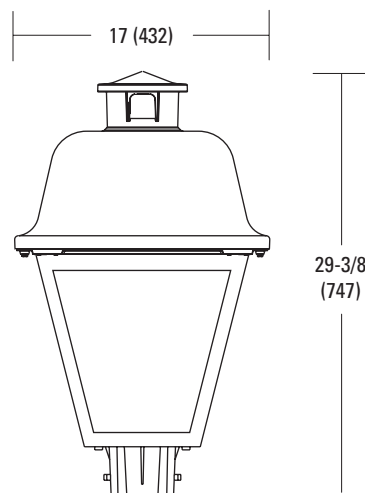
Features:

- Long-life platform: both the LED light engine and electronic multi-volt driver (120-277V) are rated
- 100,000 hrs at 25°C ambient (per LM-80)
- Surge protection device (standard) exceeds ANSI C62.41 Category C1 criteria (surge tested at 10kV/5kA)
- Hinged hood and captive thumb screws provision afford quick, easy access to electrical and optical area for servicing
- Slipfitter with three set screws allows secure installation to pole sizes 2-3/8" or 3" O.D
- New DTL photocontrols for solid-state lighting (PCLL option) complies with ANSI C136.10 criteria
- Downward lumens exceed that of a typical 150W HPS platform
- 3K, 4K and 5K CCT choices
- CSA listed at 30°C
- LED electronic 0V-10V dimmable driver
- DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Applications:

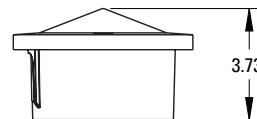
Streetscapes
Walkways
Pathways
Parks

DIMENSIONS

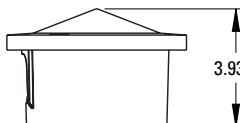


Effective Projected Area (EPA)

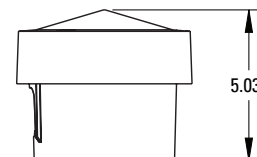
The EPA for the ARDCL 1.35 sq. ft.
P5 or P7 option total height is 24.9 (633).
Approx. Wt. = 39 lbs.



Cupola height
P3 without ROAM
Shown in line diagram



Cupola height
P5/P7 without ROAM



Cupola height
P5/P7 with ROAM

All dimensions are inches (millimeters) unless otherwise noted.

American Revolution Deluxe Full Cutoff LED

Series ARDCL

ORDERING INFORMATION

Example: ARDCL 30LEDE10 MVOLT 4K R3

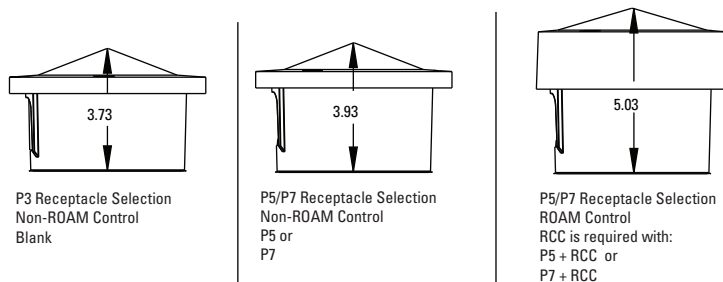
Series	Performance Package	Voltage	Color Temperature (CCT)
ARDCL American Revolution Full Cutoff Deluxe LED	30LEDE10 30 Chips, 1000 mA Driver, 106 input watts 30LEDE70 30 Chips, 700 mA Driver, 67 input watts 20LEDE10 20 Chips, 1000 mA Driver, 72 input watts 20LEDE70 20 Chips, 700 mA Driver, 47 input watts 10LEDE10 10 Chips, 1000 mA Driver, 40 input watts 10LEDE70 10 Chips, 700 mA Driver, 26 input watts	MVOLT Multi-volt, 120-277V 347 347V 480 480V	3K 3000K 4K 4000K 5K 5000K

Distribution	Options	
R2 Type II R3 Type III R5 Type V	Paint ¹ (blank) Black (standard) GY Gray DDB Dark Bronze WH White BZ Bronze	Miscellaneous NL NEMA Label TL Tool-less Entry LDR ⁷ Ladder Rest SH Shorting Cap SHX ⁶ Not CSA Listed Shorting Cap HSS House Side Shield XL Not CSA Listed CR Enhanced Corrosion Resistant Finish SS Stainless Steel Hardware RCC ⁸ ROAM Dimming Node Cupola Cover
	Photocontrol (blank) 3 pin NEMA Photocontrol Receptacle (standard) NR ² No Photocontrol Receptacle P5 ³ 5 pin NEMA Photocontrol Receptacle (dimmmable driver included) P7 ³ 7 pin NEMA Photocontrol Receptacle (dimmmable driver included) PCLL ^{4,5} Solid State Long Life Photocontrol PCSS ^{4,5,6} Not CSA Listed Solid State Long Life Photocontrol (120-277V)	Accessories RNC57 ³ ROAM Dimming Node Cupola Cover

Notes:

1. Other colors available, please contact factory
2. PC and SH not available with NR option
3. Taller cupola cover (RCC) is required when used with ROAM or other similar wireless monitoring control systems
4. Standard failure mode="Fail On"
5. Photocontrols supplied with ANSI Standard Turn-On levels
6. XL option is required
7. Ships with unit, field installed
8. Required when using ROAM or other similar wireless monitoring control systems

Cupola size based on type of control and receptacle



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023

www.americanelectriclighting.com

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Warranty Five-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

American Revolution Deluxe Full Cutoff LED

Series ARDCL

OPERATING CHARACTERISTICS

DLC products are listed in **BOLD**.

Non DLC products are indicated by shaded box.

LED Quantity, mA, CCT	Input Watts	TOTAL LUMENS					
		R2	LPW	R3	LPW	R5	LPW
30LEDE10 3K	106	8,901	84	9,011	85	9,646	91
30LEDE10 4K	106	9,558	90	9,675	91	10,359	98
30LEDE10 5K	106	9,618	91	9,735	92	10,424	98
30LEDE70 3K	67	6,773	101	6,856	102	7,340	110
30LEDE70 4K	67	7,273	109	7,363	110	7,882	118
30LEDE70 5K	67	7,318	109	7,408	111	7,931	118
20LEDE10 3K	72	6,328	88	6,405	89	6,858	95
20LEDE10 4K	72	6,795	94	6,878	96	7,364	102
20LEDE10 5K	72	6,838	95	6,922	96	7,411	103
20LEDE70 3K	47	4,643	99	4,700	100	5,033	107
20LEDE70 4K	47	4,986	106	5,048	107	5,404	115
20LEDE70 5K	47	5,017	107	5,079	108	5,437	116
10LEDE10 3K	40	3,311	83	3,351	84	3,588	90
10LEDE10 4K	40	3,555	89	3,599	90	3,852	96
10LEDE10 5K	40	3,577	89	3,621	91	3,877	97
10LEDE70 3K	26	2,371	91	2,400	92	2,569	99
10LEDE70 4K	26	2,545	98	2,577	99	2,759	106
10LEDE70 5K	26	2,561	99	2,593	100	2,776	107

DLC products are listed in **BOLD**.

Non DLC products are indicated by shaded box.

LED Quantity, mA, CCT	Input Watts	TOTAL LUMENS w/HSS (HOUSE SIDE SHIELD)					
		R2	LPW	R3	LPW	R5	LPW
30LEDE10 3K	106	7,595	72	7,655	72	6,899	65
30LEDE10 4K	106	8,154	77	8,218	78	7,408	70
30LEDE10 5K	106	8,205	77	8,270	78	7,454	70
30LEDE70 3K	67	5,778	86	5,824	87	5,249	78
30LEDE70 4K	67	6,205	93	6,254	93	5,637	84
30LEDE70 5K	67	6,243	93	6,293	94	5,673	85
20LEDE10 3K	72	5,398	75	5,442	76	4,905	68
20LEDE10 4K	72	5,797	81	5,842	81	5,267	73
20LEDE10 5K	72	5,833	81	5,879	82	5,300	74
20LEDE70 3K	47	3,961	84	3,993	85	3,599	77
20LEDE70 4K	47	4,255	91	4,288	91	3,864	82
20LEDE70 5K	47	4,281	91	4,315	92	3,888	83
10LEDE10 3K	40	2,824	71	2,847	71	2,566	64
10LEDE10 4K	40	3,032	76	3,057	76	2,755	69
10LEDE10 5K	40	3,051	76	3,075	77	2,773	69
10LEDE70 3K	26	2,023	78	2,038	78	1,837	71
10LEDE70 4K	26	2,172	84	2,189	84	1,973	76
10LEDE70 5K	26	2,186	84	2,203	85	1,985	76



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OUTDOOR PHOTOMETRIC REPORT

CATALOG: ARDCL 10LEDE70 XXXX 4K R5

TEST #: LTL26581P108
 TEST LAB: SCALED PHOTOMETRY
 TEST NOTES: SCALED FROM ABSOLUTE TEST: LTL26581P16 AND
 BASED ON NOMINAL SYSTEM PERFORMANCE.

TEST DATE: 1/14/2016

CATALOG: ARDCL 10LEDE70 XXXX 4K R5

DESCRIPTION: AMERICAN REVOLUTION DELUXE LED FULL CUTOFF
WITH 10LED, 4K WITH R5 DISTRIBUTION.

SERIES: SERIES ARDCL LED - FULL CUTOFF

LAMP CATALOG: 10 CHIPS

LAMP: LED

LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 2759.3, **ABSOLUTE
PHOTOMETRY ***

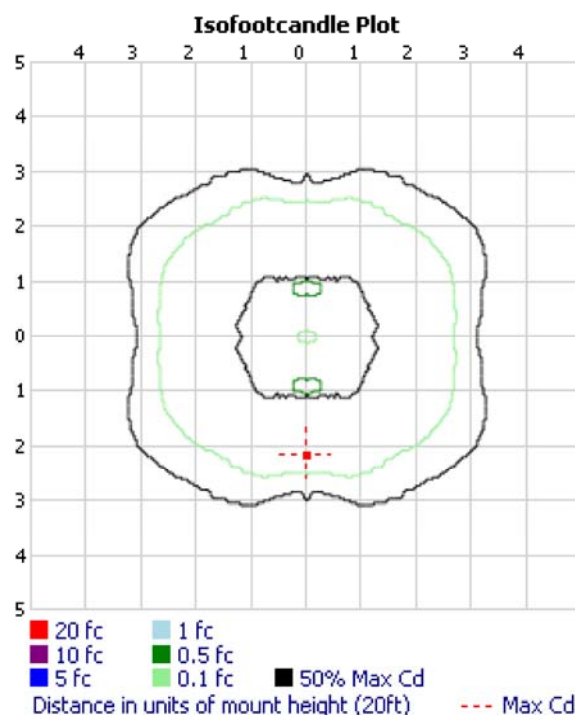
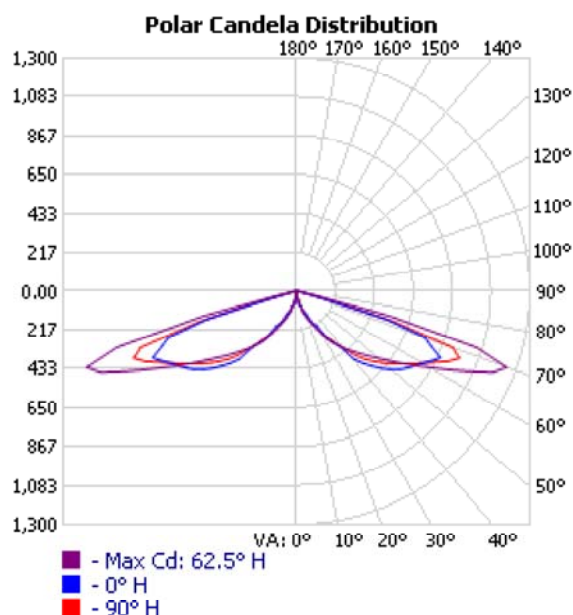
BALLAST / DRIVER: LED DRIVER

INPUT WATTAGE: 26

LUMINOUS OPENING: RECTANGLE (L: 9.72", W: 5.28")

Max Cd: 1,244.7 AT HORIZONTAL: 62.5°, VERTICAL: 70°

ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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 VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ARDCL 10LEDE70 XXXX 4K R5



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	123.2	4.5%
0-40	338.0	12.2%
0-60	1,374.7	49.8%
60-90	1,384.7	50.2%
70-100	454.4	16.5%
90-120	0.000	0%
0-90	2,759.3	100%
90-180	0.000	0%
0-180	2,759.3	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	3.9	0.1%	90-100	0.000	0%
10-20	28.5	1.0%	100-110	0.000	0%
20-30	90.9	3.3%	110-120	0.000	0%
30-40	214.7	7.8%	120-130	0.000	0%
40-50	400.9	14.5%	130-140	0.000	0%
50-60	635.8	23.0%	140-150	0.000	0%
60-70	930.2	33.7%	150-160	0.000	0%
70-80	444.2	16.1%	160-170	0.000	0%
80-90	10.3	0.4%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS
Max Cd, 90 Deg Vert:	0.000
Max Cd, 80 to <90 Deg:	43.6
	Lumens % Lamp
Downward Street Side:	1,379.5 50%
Downward House Side:	1,379.5 50%
Downward Total:	2,759.0 100%
Upward Street Side:	0.000 0%
Upward House Side:	0.000 0%
Upward Total:	0.000 0%
Total Lumens:	2,759.0 100%

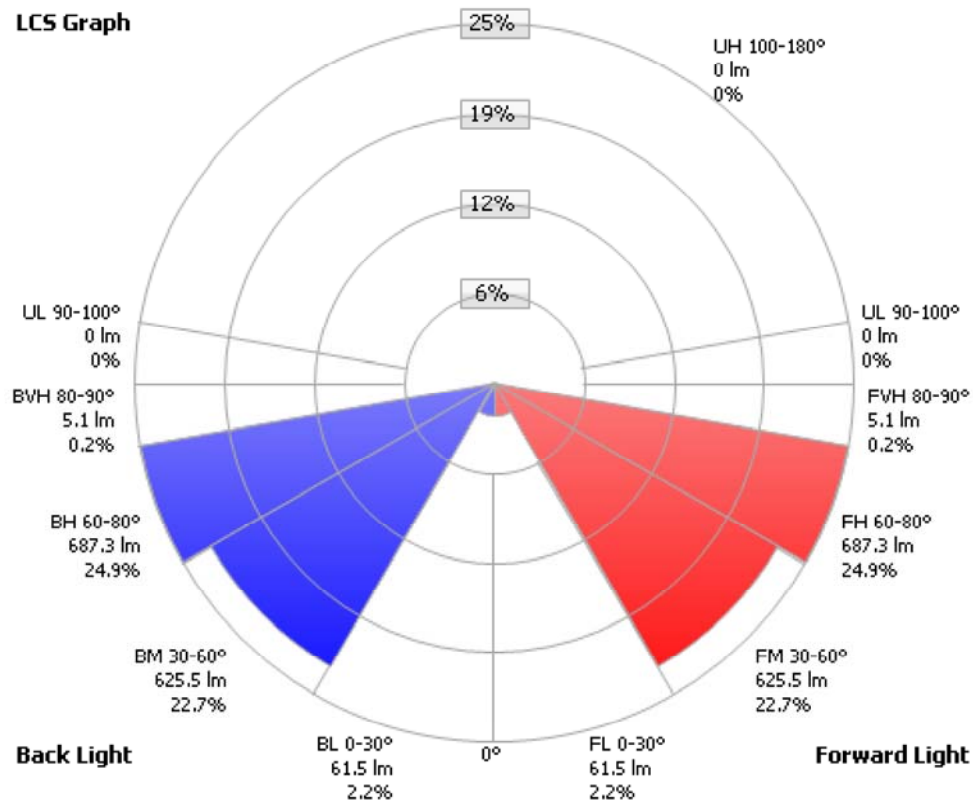
LCS TABLE

BUG RATING	B2 - U0 - G1
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	61.5 2.2%
Medium(30-60):	625.5 22.7%
High(60-80):	687.3 24.9%
Very High(80-90):	5.1 0.2%
BACK LIGHT	
Low(0-30):	61.5 2.2%
Medium(30-60):	625.5 22.7%
High(60-80):	687.3 24.9%
Very High(80-90):	5.1 0.2%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	0.3 0%

OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ARDCL 10LEDE70 XXXX 4K R5



LCS Graph



Back Light

Forward Light

Scale = Max LCS %

Trapped Light: 0.3lm, 0%



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 VISUAL PHOTOMETRIC TOOL

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OUTDOOR PHOTOMETRIC REPORT
CATALOG: ARDCL 10LEDE70 XXXX 4K R5



CANDELA TABLE - TYPE C

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
5	38	42	42	42	41	40	39	37	35	30	27	25	23	20	19	17	15	19	21
10	74	79	78	78	77	77	75	68	60	57	50	43	43	47	47	47	42	38	44
15	81	104	103	102	97	87	84	84	93	94	104	102	98	95	98	90	87	78	86
20	126	132	131	130	130	124	136	143	132	137	138	143	148	156	140	143	138	130	130
25	186	190	189	186	178	181	177	180	184	190	197	191	202	207	206	204	205	192	183
30	225	252	250	241	226	238	237	243	255	250	255	261	268	272	286	287	286	279	261
35	346	336	332	321	327	336	308	314	324	325	331	342	350	341	344	344	345	345	332
40	499	477	473	461	445	419	388	402	404	408	417	422	427	425	417	414	423	421	431
45	592	569	571	560	533	501	485	476	482	485	505	495	509	518	503	496	490	507	539
50	681	659	668	666	630	591	583	560	566	565	587	585	601	619	594	586	575	601	623
55	750	735	755	781	750	714	709	659	657	657	670	690	701	707	692	690	673	701	707
60	807	810	843	899	882	868	847	768	756	771	781	806	818	819	820	817	785	818	807
65	884	820	868	953	1000	1035	1040	949	919	947	966	988	993	996	992	953	943	949	931
70	761	699	763	868	938	987	994	935	949	1057	1141	1166	1175	1184	1129	1025	996	951	926
75	125	135	161	215	284	345	403	421	446	493	509	553	548	495	389	278	228	180	166
80	26	22	24	28	30	30	31	30	31	38	42	42	42	42	41	30	23	18	15
85	7	6	6	7	7	7	6	6	6	5	5	5	4	4	4	4	3	3	1
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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OUTDOOR PHOTOMETRIC REPORT

CATALOG: ARDCL 20LEDE70 XXXX 4K R5

TEST #: LTL26581P102
 TEST LAB: SCALED PHOTOMETRY
 TEST NOTES: SCALED FROM ABSOLUTE TEST: LTL26581P10 AND
 BASED ON NOMINAL SYSTEM PERFORMANCE.

TEST DATE: 1/14/2016

CATALOG: ARDCL 20LEDE70 XXXX 4K R5

DESCRIPTION: AMERICAN REVOLUTION DELUXE LED FULL CUTOFF
WITH 20LED, 4K WITH R5 DISTRIBUTION.

SERIES: SERIES ARDCL LED - FULL CUTOFF

LAMP CATALOG: 20 CHIPS

LAMP: LED

LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 5404.3, **ABSOLUTE
PHOTOMETRY ***

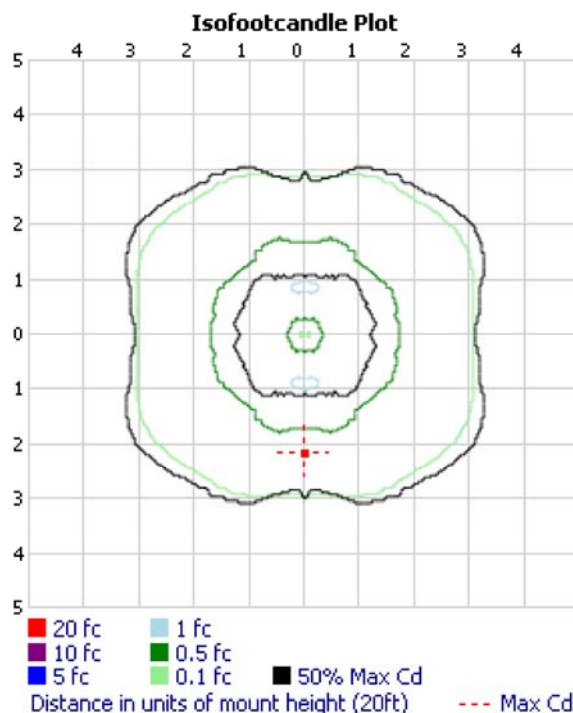
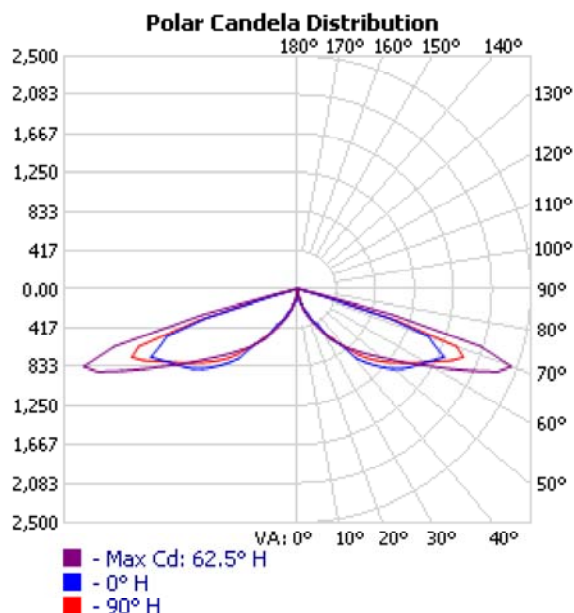
BALLAST / DRIVER: LED DRIVER

INPUT WATTAGE: 47

LUMINOUS OPENING: RECTANGLE (L: 9.72", W: 5.28")

Max Cd: 2,437.9 AT HORIZONTAL: 62.5°, VERTICAL: 70°

ROADWAY CLASS: TYPE VS



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ARDCL 20LEDE70 XXXX 4K R5



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	241.4	4.5%
0-40	662.0	12.2%
0-60	2,692.4	49.8%
60-90	2,711.9	50.2%
70-100	890.0	16.5%
90-120	0.000	0%
0-90	5,404.3	100%
90-180	0.000	0%
0-180	5,404.3	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	7.5	0.1%	90-100	0.000	0%
10-20	55.9	1.0%	100-110	0.000	0%
20-30	178.0	3.3%	110-120	0.000	0%
30-40	420.6	7.8%	120-130	0.000	0%
40-50	785.2	14.5%	130-140	0.000	0%
50-60	1,245.2	23.0%	140-150	0.000	0%
60-70	1,821.9	33.7%	150-160	0.000	0%
70-80	869.9	16.1%	160-170	0.000	0%
80-90	20.1	0.4%	170-180	0.000	0%

ROADWAY SUMMARY

Distribution:	Type VS
Max Cd, 90 Deg Vert:	0.000
Max Cd, 80 to <90 Deg:	85.3
	Lumens % Lamp
Downward Street Side:	2,701.8 50%
Downward House Side:	2,701.8 50%
Downward Total:	5,403.6 100%
Upward Street Side:	0.000 0%
Upward House Side:	0.000 0%
Upward Total:	0.000 0%
Total Lumens:	5,403.6 100%

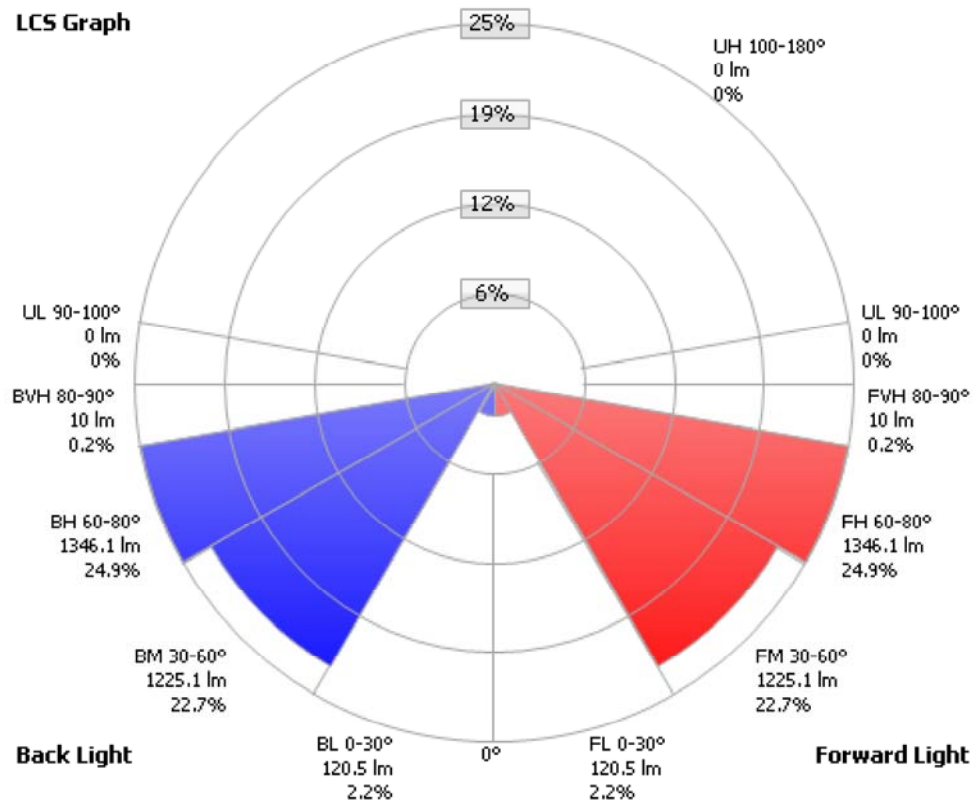
LCS TABLE

BUG RATING	B3 - U0 - G1
FORWARD LIGHT	LUMENS LUMENS %
Low(0-30):	120.5 2.2%
Medium(30-60):	1,225.1 22.7%
High(60-80):	1,346.1 24.9%
Very High(80-90):	10.0 0.2%
BACK LIGHT	
Low(0-30):	120.5 2.2%
Medium(30-60):	1,225.1 22.7%
High(60-80):	1,346.1 24.9%
Very High(80-90):	10.0 0.2%
UPLIGHT	
Low(90-100):	0.000 0%
High(100-180):	0.000 0%
TRAPPED LIGHT:	0.6 0%

OUTDOOR PHOTOMETRIC REPORT
 CATALOG: ARDCL 20LEDE70 XXXX 4K R5



LCS Graph



Back Light

Forward Light

Scale = Max LCS %

Trapped Light: 0.6lm, 0%



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CATALOG: ARDCL 20LEDE70 XXXX 4K R5



CANDELA TABLE - TYPE C

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
5	75	83	82	82	80	78	75	72	69	59	52	49	44	39	37	34	29	37	42
10	145	154	152	153	152	151	147	133	117	111	97	85	85	92	92	92	82	74	86
15	159	204	201	199	190	171	164	165	181	185	205	199	192	186	192	176	171	154	169
20	247	259	256	255	254	243	266	279	259	269	269	279	291	305	275	281	269	255	254
25	365	373	370	364	348	355	347	352	360	372	386	374	395	405	403	400	402	375	358
30	440	494	490	472	443	467	464	477	499	489	500	511	524	532	561	563	559	546	512
35	678	658	650	629	640	659	603	614	635	638	649	670	686	668	673	674	676	675	649
40	977	935	927	902	871	821	760	787	791	798	817	826	836	833	817	812	828	824	843
45	1160	1114	1118	1097	1044	981	950	932	944	951	989	970	997	1014	984	971	960	993	1056
50	1334	1291	1309	1305	1235	1158	1141	1097	1109	1107	1149	1147	1178	1212	1164	1148	1127	1178	1220
55	1468	1439	1479	1530	1469	1398	1388	1290	1288	1288	1313	1351	1373	1385	1355	1352	1317	1374	1385
60	1580	1587	1651	1760	1727	1700	1659	1505	1482	1509	1530	1579	1602	1604	1606	1599	1538	1602	1580
65	1732	1605	1701	1867	1958	2027	2037	1858	1800	1855	1892	1935	1945	1950	1944	1867	1848	1859	1824
70	1491	1368	1494	1700	1836	1932	1947	1832	1859	2070	2234	2283	2300	2318	2211	2008	1951	1862	1814
75	244	264	315	422	556	676	789	824	873	966	998	1084	1073	970	762	545	446	352	324
80	51	43	48	54	58	59	61	58	61	75	83	83	82	83	80	58	44	35	30
85	13	11	12	13	14	13	13	11	11	10	10	10	8	8	7	7	6	6	3
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Flood Lighting

LED 20 Flood (ACP0)

23,068 lumens

Full and Upper/Lower
Visor

ACPOLED Series

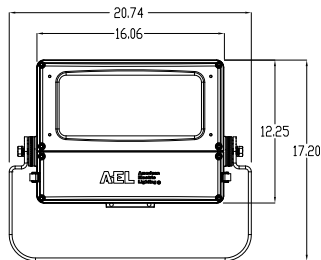
American Compact LED Floodlight

PRODUCT OVERVIEW

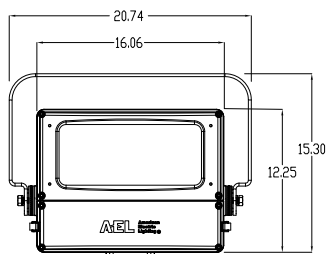


Applications:

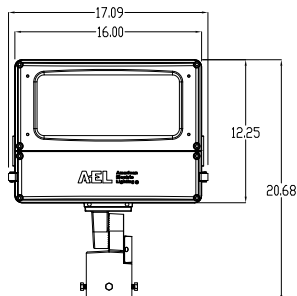
Auto dealerships	Shopping centers
Schools	Parking lots
Churches	Substations
Industrial sites	Building facades



YK-Yoke Mount Luminaire EPA of 1.76 Ft² and max weight 30 lbs.



YKE-Yoke Mount Luminaire EPA of 1.76 Ft² and max weight 31 lbs.



Tenon Mount Luminaire EPA of 1.89 Ft² and max weight 28 lbs.

Features:

Mechanical

Low copper content die cast aluminum housings has integral heat sink fins to optimize thermal management through conductive and convective cooling. Bolted or optional stainless steel latch disengages top electrical cover for easy access to LED driver, surge protection, and terminal block. The yoke mount unit is shipped prewired with specified cord type and cord length to facilitate easy wiring of luminaire. The tenon mount unit is prewired to luminaire wiring chamber.

Luminaire is vibration rated to 3G per ANSI C136.31-2001 and rated IP66 per IEC60068-2-3.

Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber per ASTM B117.

Yoke shall be painted steel or galvanized steel. Knuckle mount shall be adjustable to fit 2-3/8 inch to 2-7/8 inch tenon.

Electrical

LED light engine is rated minimum 100,000 hours at 25C, L70. Electronic driver has an expected life of 100,000 hours at a 25C ambient.

Robust surge protection: Three different surge protection options provide a minimum IEEE/ANSI C62.41 category C (10kV/5kA) protection. Extreme 20kV/10kA protection is also available.

Driver power factor is 90% minimum. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant.

Optical

PCB mounted LED technology comprised of multi-cluster LEDs on single metal core board. Segmented Miro internal reflectors are designed for superior field to beam ratios, uniformity, and spacing.

NEMA optical pattern choice of medium flood (4X4), flood (5x5) wide flood (6x6), and wide flood rectangle (6x5). The luminaire is available with 3000K, 4000K, and 5000K with minimum CRI of 70.

Optional shielding available to control light trespass and uplight. Optical enclosure shall be glass lens.

Controls

NEMA photocontrol receptacle 3 pin (P3) or 7 pin (P7) available.

Optional premium solid state locking- style photocontrol – DSS (10 year rated life).

Optional extreme long life solid state locking –style photocontrol – DLL (20 year rated life).

Optional onboard adjustable output module (AO) allows the light output and input wattage to be modified to meet site specific requirements.

Standards

Suitable for ambient temperature -40C to 40C.

CSA Certified to U.S. and Canadian standards.

ACPOLED Series

American Compact LED Floodlight

ORDERING INFORMATION

Example: ACP0LED PK3 MVOLT WFL 40K TM GYSDP

Series		Performance Package		Voltage		Direct Distribution		Color Temperature (CCT)	
ACP0LED	Flood	PK1	6,000 Lumen Package	MVOLT	Multi-volt (120-277)	MFL	Medium Flood (4X4)	30K	3000K
		PK2	10,000 Lumen Package	347	347V	FL	Flood (5X5)	40K	4000K
		PK3	14,000 Lumen Package	480	480V	WFL	Wide Flood (6X6)	50K	5000K
		PK4	18,000 Lumen Package			WFR	Wide Flood Rectangle (6X5)		
		PK5	22,000 Lumen Package						

Mounting Method		Color		Surge protection	
TM	Tenon Slipfitter - Knuckle	BZSDP	Bronze Super Durable Paint Finish	10KVIL	10kV/5kA Fail off W/Indicator Light
YK	Yoke Painted Steel	BKSDP	Black Super Durable Paint Finish	10KVMP	10kV/5kA MOV (fail on)
YKE	Yoke Painted Steel Extended Length	GYSDP	Gray Super Durable Paint Finish	20KV	20kV/10kA Extreme Surge (fail off)
YG	Yoke Galvanized Steel	WHSDP	White Super Durable Paint Finish		
		GHSDP	Graphite Super Durable Paint Finish		

Options/Controls		Cord Length		Cord Type	
PER7	P7 Rotating PC Receptacle	04	4 ft. cord length	63	16 gage, 3 conductor cord
PER3	P3 Receptacle	05	5 ft. cord length	43	14 gage, 3 conductor cord
NR	No Photocontrol Receptacle	06	6 ft. cord length	23	12 gage, 3 conductor cord
DM	0-10V Dimming Control (controls provided by others)	08	8 ft. cord length		
DSS	Solid State Photocontrol	10	10 ft. cord length		
DLL	Solid State Long Life Photocontrol	12	12 ft. cord length		
SH	Shorting Cap	15	15 ft. cord length		
AO	Field Adjustable Output	20	20 ft. cord length		
DALI	Dali driver- consult factory	25	25 ft. cord length		
PNMT	Part night dimming- consult factory				

Miscellaneous		Accessories (Shipped Separately)	
TL	Tool Less Entry	ACP0LEDV-BZSDP	Full Visor Bronze
NL	NEMA Label	ACP0LEDV-BKSDP	Full Visor Black
		ACP0LEDV-GYSDP	Full Visor Grey
		ACP0LEDV-WHSDP	Full Visor White
		ACP0LEDV-GHDP	Full Visor Graphite
		ACP0LEDUBV-BZSDP	Upper/Bottom visor (universal) Bronze
		ACP0LEDUBV-BKSDP	Upper/Bottom visor (universal) Black
		ACP0LEDUBV-GYSDP	Upper/Bottom visor (universal) Grey
		ACP0LEDUBV-WHSDP	Upper/Bottom visor (universal) White
		ACP0LEDUBV-GHSDP	Upper/Bottom visor (universal) Graphite
		ACP0LEDVG	Vandal Guard
		ACP0LEDWG	Wire Guard



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
www.americanelectriclighting.com

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Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

ACPOLED Series

American Compact LED Floodlight

Performance Packages

ACPOLED	Distribution	Lumens	Input Watts	LPW	Input Operating Amps					
		4000K			120V	208V	240V	277V	347V	480V
PK1					0.41	0.24	0.21	0.18	0.15	0.11
	MFL	5,877	49	120						
	FL	6,085	49	124						
	WFL	6,274	49	128						
	WFR	6,177	49	126						
PK2					0.66	0.39	0.34	0.29	0.22	0.17
	MFL	9,506	79	120						
	FL	9,844	79	125						
	WFL	10,150	79	128						
	WFR	9,993	79	126						
PK3					0.99	0.58	0.51	0.45	0.37	0.28
	MFL	13,654	119	115						
	FL	14,139	119	119						
	WFL	14,579	119	123						
	WFR	14,353	119	121						
PK4					1.25	0.72	0.63	0.55	0.45	0.34
	MFL	17,284	150	115						
	FL	17,898	150	119						
	WFL	18,454	150	123						
	WFR	18,169	150	121						
PK5					1.66	0.96	0.83	0.72	0.58	0.43
	MFL	21,605	199	109						
	FL	22,372	199	112						
	WFL	23,067	199	116						
	WFR	22,711	199	114						

LLD					
	PK1	PK2	PK3	PK4	PK5
25,000 hours	0.98	0.98	0.98	0.98	0.96
50,000 hours	0.96	0.96	0.96	0.96	0.92
100,000 hours	0.92	0.92	0.92	0.92	0.85

LAT				
0C	15C	25C	35C	40C
1.06	1.02	1.00	0.98	0.96

AO Module		
AO setting	Lumens %	Wattage %
8	100%	100%
7	100%	100%
6	100%	100%
5	90%	87%
4	79%	75%
3	68%	61%
2	55%	49%
1	42%	37%



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www.americanelectriclighting.com

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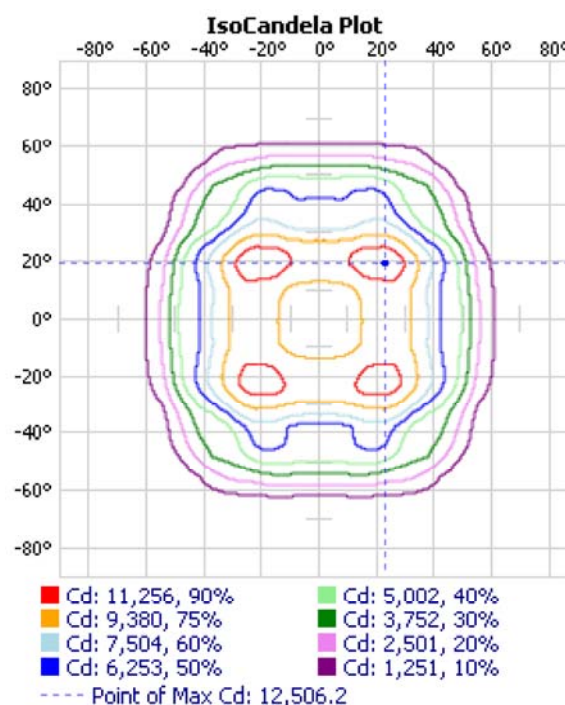
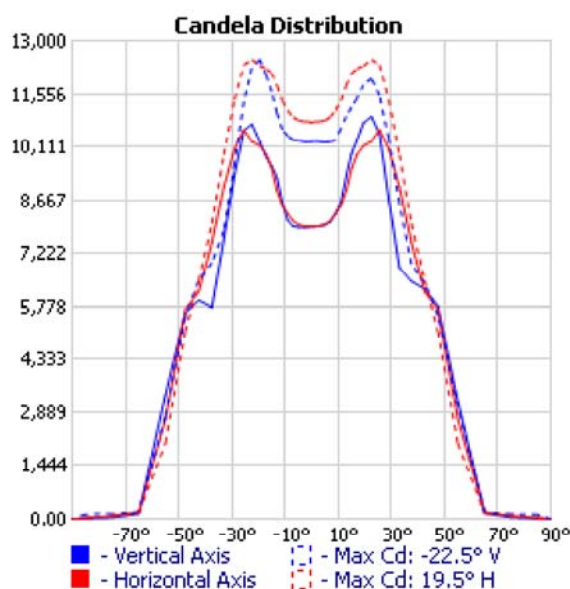
Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K

TEST #: ISF 32235P1
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 10/27/2016
 CATALOG: ACP0LED PK5 XXXX WFL 40K/50K
 DESCRIPTION: ACP0 LED FLOOD LIGHT, PK5, WFL DISTRIBUTION, 4000K & 5000K
 SERIES: FLOODS-ACP LED
 LAMP CATALOG: LED
 LAMP: HDM
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 23067.7, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER
 INPUT WATTAGE: 199
 LUMINOUS OPENING: (L: 0", W: 12.96", H: 6.48")
 NEMA TYPE: 6 X 6
 Max Cd: 12,506.2 AT HORIZONTAL: -22.5°, VERTICAL: 19.5°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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 VISUAL PHOTOMETRIC TOOL

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FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K

**ZONAL LUMEN SUMMARY**

Zone	Lumens	% Luminaire
0-30	8,452.6	36.6%
0-40	14,057.0	60.9%
0-60	22,044.0	95.4%
60-90	1,051.3	4.6%
0-90	23,095.3	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	772.5	3.3%
10-20	2,697.9	11.7%
20-30	4,982.3	21.6%
30-40	5,604.3	24.3%
40-50	4,840.6	21.0%
50-60	3,146.4	13.6%
60-70	838.7	3.6%
70-80	136.3	0.6%
80-90	76.3	0.3%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	97.5%	22,522.4	118.5	122.2
Beam (50%):	71.1%	16,413.0	86.7	87.1
Total:	99.9%	23,067.8		

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACPOLLED PK5 XXXX WFL 40K/50K



CANDELA TABLE - TYPE B

	-90	-85	-75	-65	-55	-15	-5	0	5	15	55	65	75	85	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	23	29	41	72	150	101	23	101	150	72	41	29	23	0
75	0	26	36	51	86	119	56	50	56	119	86	51	36	26	0
65	0	28	45	68	118	173	166	169	166	173	118	68	45	28	0
55	0	29	55	91	155	3224	3192	3178	3192	3224	155	91	55	29	0
15	0	33	88	174	2292	11245	10022	9922	10022	11245	2292	174	88	33	0
5	0	33	91	187	2632	9598	8050	7986	8050	9598	2632	187	91	33	0
0	0	33	91	192	2696	9510	7997	7940	7997	9510	2696	192	91	33	0
-5	0	33	92	192	2669	9537	7999	7927	7999	9537	2669	192	92	33	0
-15	0	33	88	176	2400	10918	9660	9575	9660	10918	2400	176	88	33	0
-55	0	28	55	96	162	3463	3368	3358	3368	3463	162	96	55	28	0
-65	0	27	46	69	121	160	152	152	152	160	121	69	46	27	0
-75	0	24	37	51	84	115	55	47	55	115	84	51	37	24	0
-85	0	22	31	41	70	138	90	23	90	138	70	41	31	22	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 INTRODUCTION

1.1 Product Description

The Full and Upper/Bottom Visors are intended to limit the light directed to the sides, above, and below the luminaire. The Full Visor and Upper/Bottom Visor assemblies consist of the visor and (4) 10-24 x 1/2" fasteners.

1.2 Alternate Information Sources. If additional questions arise relative to these luminaires that this document or your supplier cannot answer, please refer them to:

American Electric Lighting
Field Service Department
P.O. Box 3004
Newark, OH 43058-3004
(740) 345-9631

2 INSTALLATION

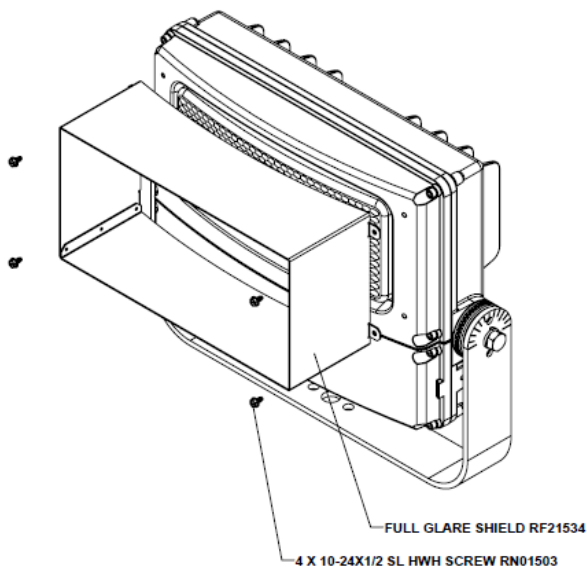
2.1 Tools and Materials Required.

DESCRIPTION	USE
5/16" Socket or Nut Driver	Wire Guard Fasteners

2.2 Full Visor Installation.

Orient the Full Visor as shown in Figure 1. Attach Full Visor utilizing the (4) 10-24 x 1/2" fasteners provided by placing a fastener through each visor mounting hole and into the fixture mounting holes. Tighten each fastener to approximately 25 in-lbs.

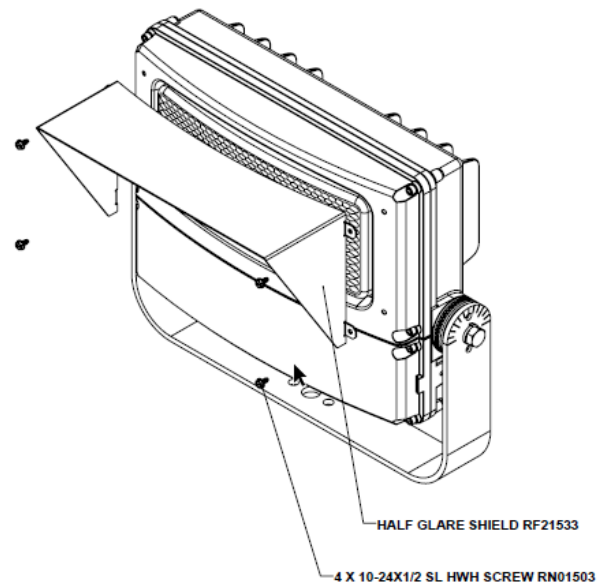
Figure 1



GR2531

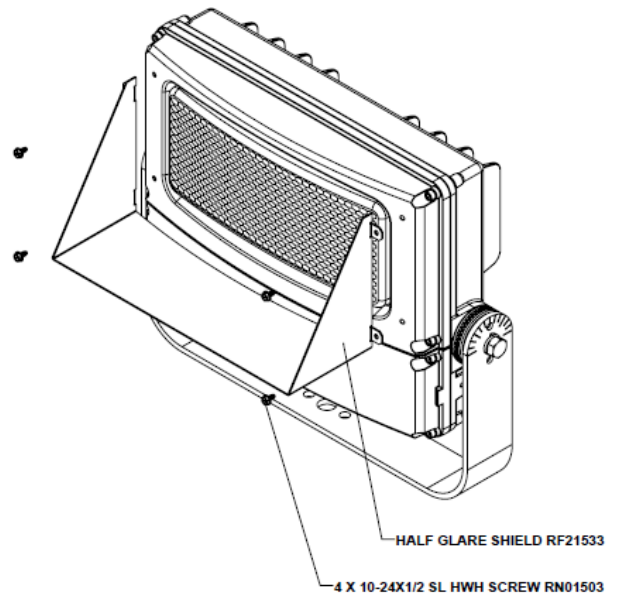
Orient the Upper/Bottom Visor as shown in Figure 2 or 3 as needed. Attach Upper/Bottom Visor utilizing the (4) 10-24 x 1/2" fasteners provided by placing a fastener through each visor mounting hole and into the fixture mounting holes. Tighten each fastener to approximately 25 in-lbs.

Figure 2



GR2533

Figure 3



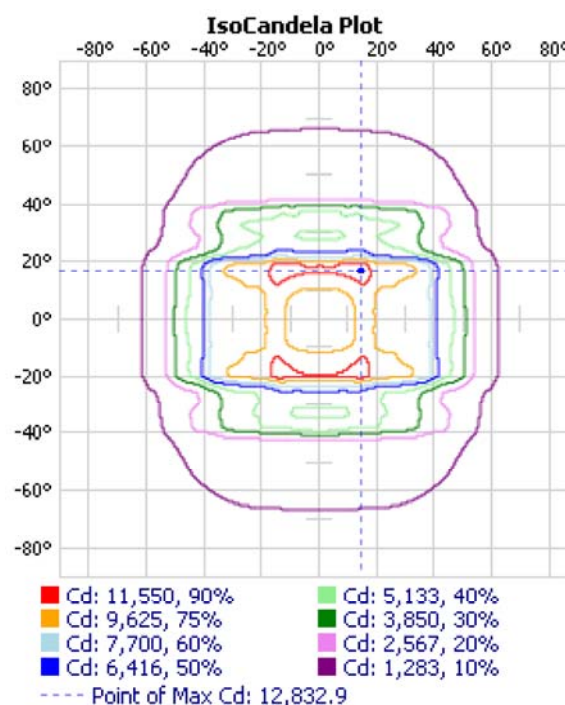
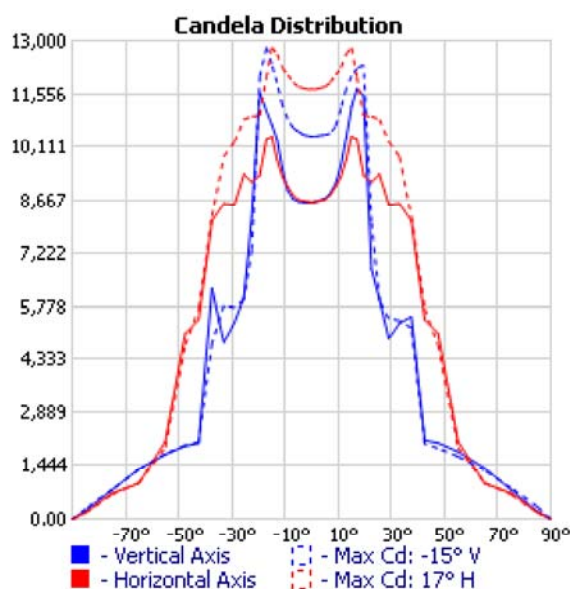
GR2532

2.3 Upper/Bottom Visor Installation

FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K FV

TEST #: ISF 32293P1
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 10/27/2016
 CATALOG: ACP0LED PK5 XXXX WFL 40K/50K FV
 DESCRIPTION: ACP0 LED FLOOD LIGHT, PK5, WFL DISTRIBUTION, 4000K & 5000K, FV
 SERIES: FLOODS-ACP LED
 LAMP CATALOG: LED
 LAMP: HDM
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 19281.1, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER
 INPUT WATTAGE: 199
 LUMINOUS OPENING: (L: 0", W: 12.96", H: 6.48")
 NEMA TYPE: 6 X 7
 Max Cd: 12,832.9 AT HORIZONTAL: -15°, VERTICAL: 17°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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VISUAL PHOTOMETRIC TOOL

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FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K FV

**ZONAL LUMEN SUMMARY**

Zone	Lumens	% Luminaire
0-30	7,918.5	41%
0-40	12,090.5	62.6%
0-60	16,929.1	87.7%
60-90	2,381.3	12.3%
0-90	19,310.3	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	843.6	4.4%
10-20	2,944.1	15.2%
20-30	4,130.8	21.4%
30-40	4,172.0	21.6%
40-50	2,999.2	15.5%
50-60	1,839.3	9.5%
60-70	1,260.5	6.5%
70-80	831.1	4.3%
80-90	289.7	1.5%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	91.2%	17,604.5	123.6	131.6
Beam (50%):	52.6%	10,163.3	82.2	49.3
Total:	99.8%	19,281.1		

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VISUAL PHOTOMETRIC TOOLPUBLISH
PAGE 2 OF 3

FLOOD PHOTOMETRIC REPORT

CATALOG: ACPOLED PK5 XXXX WFL 40K/50K FV

**CANDELA TABLE - TYPE B**

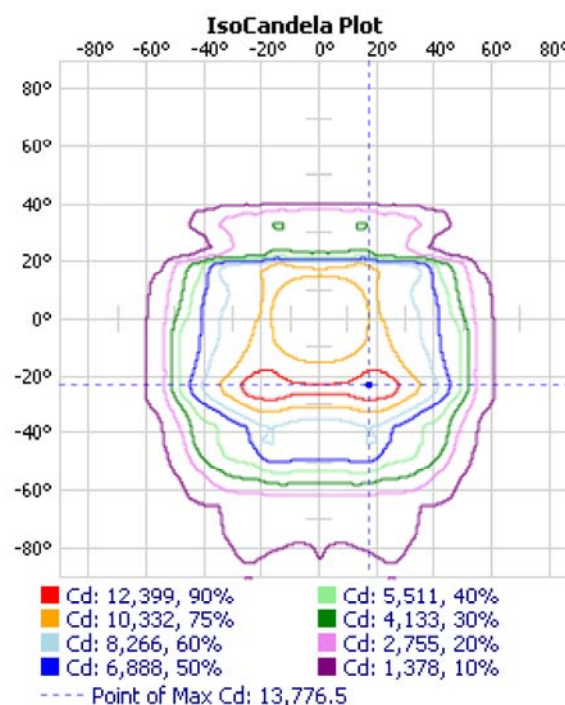
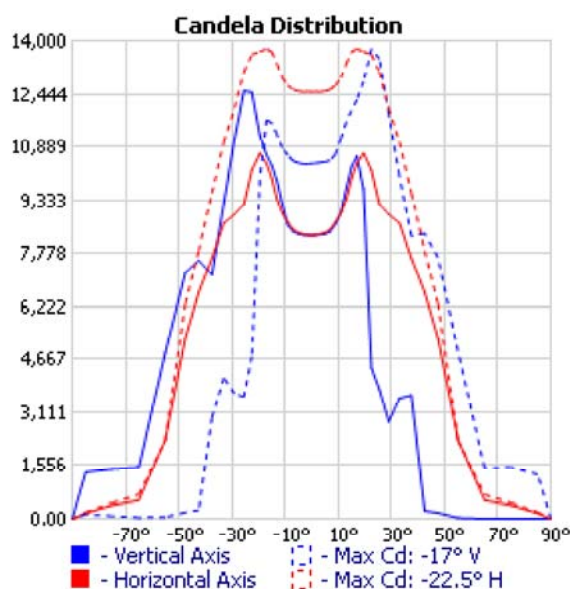
	-90	-85	-75	-65	-55	-15	-5	0	5	15	55	65	75	85	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	40	68	101	149	277	252	205	252	277	149	101	68	40	0
75	0	66	144	266	424	793	777	772	777	793	424	266	144	66	0
65	0	91	247	476	727	1334	1378	1383	1378	1334	727	476	247	91	0
55	0	116	360	676	958	1769	1833	1829	1833	1769	958	676	360	116	0
15	0	178	664	970	1980	12390	11254	11204	11254	12390	1980	970	664	178	0
5	0	183	685	962	2093	10535	8802	8719	8802	10535	2093	962	685	183	0
0	0	185	689	958	2112	10393	8684	8603	8684	10393	2112	958	689	185	0
-5	0	185	688	963	2104	10443	8715	8633	8715	10443	2104	963	688	185	0
-15	0	181	668	971	2017	12044	10823	10731	10823	12044	2017	971	668	181	0
-55	0	118	378	701	972	1698	1755	1752	1755	1698	972	701	378	118	0
-65	0	94	269	508	764	1318	1354	1352	1354	1318	764	508	269	94	0
-75	0	68	164	305	472	829	795	780	795	829	472	305	164	68	0
-85	0	40	75	122	186	329	283	234	283	329	186	122	75	40	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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VISUAL PHOTOMETRIC TOOLPUBLISH
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FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K UBV

TEST #: ISF 32294P1
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 10/27/2016
 CATALOG: ACP0LED PK5 XXXX WFL 40K/50K UBV
 DESCRIPTION: ACP0 LED FLOOD LIGHT, PK5, WFL DISTRIBUTION, 4000K & 5000K, UBV
 SERIES: FLOODS-ACP LED
 LAMP CATALOG: LED
 LAMP: HDM
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 21285.6, **ABSOLUTE PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER
 INPUT WATTAGE: 199
 LUMINOUS OPENING: (L: 0", W: 12.96", H: 6.48")
 NEMA TYPE: 6 X 6
 Max Cd: 13,776.5 AT HORIZONTAL: -17°, VERTICAL: -22.5°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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FLOOD PHOTOMETRIC REPORT

CATALOG: ACP0LED PK5 XXXX WFL 40K/50K UBV

**ZONAL LUMEN SUMMARY**

Zone	Lumens	% Luminaire
0-30	8,128.3	38.1%
0-40	12,889.9	60.5%
0-60	19,145.4	89.9%
60-90	2,162.0	10.1%
0-90	21,307.5	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	810.2	3.8%
10-20	2,831.8	13.3%
20-30	4,486.3	21.1%
30-40	4,761.6	22.3%
40-50	3,843.2	18.0%
50-60	2,412.3	11.3%
60-70	1,041.3	4.9%
70-80	656.8	3.1%
80-90	463.9	2.2%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	94.4%	20,104.9	121.6	121.6
Beam (50%):	66.2%	14,104.9	91.3	70.9
Total:	99.9%	21,285.6		

FLOOD PHOTOMETRIC REPORT

CATALOG: ACPOLED PK5 XXXX WFL 40K/50K UBV

**CANDELA TABLE - TYPE B**

	-90	-85	-75	-65	-55	-15	-5	0	5	15	55	65	75	85	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	30	30	47	78	139	82	3	82	139	78	47	30	30	0
75	0	36	30	47	79	79	13	4	13	79	79	47	30	36	0
65	0	45	35	49	83	31	13	6	13	31	83	49	35	45	0
55	0	58	58	66	99	49	43	35	43	49	99	66	58	58	0
15	0	136	334	439	1744	11663	10392	10288	10392	11663	1744	439	334	136	0
5	0	161	378	507	2225	10042	8408	8333	8408	10042	2225	507	378	161	0
0	0	170	398	546	2318	9972	8373	8297	8373	9972	2318	546	398	170	0
-5	0	181	416	586	2349	10053	8424	8337	8424	10053	2349	586	416	181	0
-15	0	194	450	656	2280	11741	10419	10337	10419	11741	2280	656	450	194	0
-55	0	192	502	768	1036	4986	4864	4881	4864	4986	1036	768	502	192	0
-65	0	177	481	742	1006	1488	1506	1503	1506	1488	1006	742	481	177	0
-75	0	156	447	699	962	1501	1462	1451	1462	1501	962	699	447	156	0
-85	0	131	391	632	898	1270	1204	1362	1204	1270	898	632	391	131	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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VISUAL PHOTOMETRIC TOOLPUBLISH
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Flood Lighting

LED 30 Flood (ACP1)

32,003 lumens

Full and Upper/Lower
Visor

ACP1LED Series

American Compact LED Floodlight

PRODUCT OVERVIEW



Applications:

Auto dealerships	Shopping centers
Schools	Parking lots
Churches	Substations
Industrial sites	Building facades

Features:

Mechanical

Low copper content die cast aluminum A360 alloy castings. Die cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Bolted or stainless steel latch option disengages top electrical cover for easy access to LED drivers, surge module, and terminal block. Vibration rated to 3G applications per ANSI C136.31-2001.

IP 66 rated luminaire per IEC60068-2-3. Superdurable TGIC thermoset powder coat over standard pretreat yields a finish that achieves a scribe creepage of 8 after 5,000 hours exposure to salt fog chamber. External fasteners shall be stainless steel. Yoke shall be painted steel or galvanized. Knuckle shall be adjustable to fit 2-3/8 inch to 2-7/8 tenon.

Electrical

Class I drivers rated for 100,000 hours life.

Quick disconnect connectors for ease of installation and maintenance.

Surge protection meets 10KV/5KA per ANSI/IEEE C62.41.

Three pin locking style photocontrol receptacle is standard and is ROAM compatible.

Driver power factor is 90% minimum.

Driver meets maximum total harmonic distortion (THD) of 20% and are ROHS compliant.

Optical

Multi die LED chip on board available with 3000K, 4000K and 5000K (70 CRI) color temperatures.

Segmented Miro 4™ internal reflectors are designed for superior field to beam ratios, uniformity, and spacing.

NEMA pattern choice of 5x5, 6x5, 6x6

Optional shielding available to control light trespass and uplight. Optical enclosure shall be glass lens.

Controls

NEMA photocontrol receptacle is standard

Photocontrol for solid-state lighting (available with PCSS option) meets ANSI C136.10 criteria

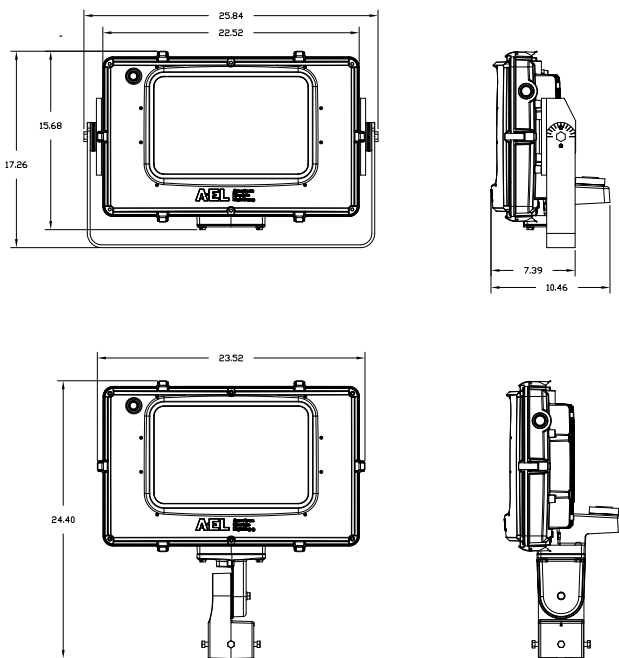
Warranty and Standards

Five year warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms-and-conditions.aspx

UL/CUL Listed

Suitable for ambient temperature -40C to 40C.

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the LED Flood™ Series ACP1LED
Knuckle mounting Max EPA 2.9 sq. ft.,
Approx. 40 lbs.

Yoke mounting is Max EPA 3.1 sq. ft.,
Approx. 47 lbs.

ACP1LED Series

American Compact LED Floodlight

ORDERING INFORMATION

Example: ACP1LED 610A MVOLT 66 4K TL

Series	Performance Package	Voltage	Nema Pattern	Color Temperature (CCT)
ACP1LED Flood	410A 4 Modules, 1050mA driver 510A 5 Modules, 1050mA driver 610A 6 Modules, 1050mA driver	120 120V 347 347V 480 480V MVOLT Multi-volt (120-277)	55 5 X 5 65 6 X 5 66 6 X 6	3K 3000K 4K 4000K 5K 5000K

Mounting	Paint ⁶	Cord Length ⁵ Cord Type ⁵	Misc
TM Tenon Slipfitter - Knuckle YK ¹ Yoke Painted YG ¹ Yoke Galvanized	BZ Bronze BK Black GY Gray WH White GI Graphite	04 4' 05 5' 06 6' 08 8' 10 10' 12 12' 15 15' 20 20' 25 25' 30 30'	TL Tool Less Entry NL Nema Label

Options

Controls

(blank) ¹	3-Pin Photocontrol Receptacle (standard)
P5 ⁴	5-Pin Photocontrol Receptacle
P7 ⁴	7-Pin Photocontrol Receptacle
NR ²	No Photocontrol Receptacle
PCSS ⁴	Solid State Lighting Photocontrol (120-277V)
PCL1 ⁴	Solid State Long Life Photocontrol (120-277V)
PCL3 ⁴	Solid State Long Life Photocontrol (347V)
PCL4 ⁴	Solid State Long Life Photocontrol (480V)
SH ⁴	Shorting Cap
DM ^{2,3}	0-10V Dimming Control (controls provided by others)

Accessories (Shipped Separately)

ACP1LEDFV- ^{6,7}	Full Visor
ACP1LEDUBV- ^{6,8}	Upper/Bottom Visor
ACP1LEDVG ⁹	Vandal Guard
ACP1LEDWG ¹⁰	Wire Guard

Notes:

- Requires cord length and cord type
- Not available with DM, NR, PCL1, PCL3, PCL4, PCSS, SH, or VE
- Not available with DE, VE options
- Not available with NR
- Not available with TM mounting. Must be combined with a cord type. EX: 0463
- Paint designator needed.
- Not compatible with WG, VG, or UBV
- Not compatible with WG, VG, or FV
- Not compatible with WG, FV, or UBV
- Not compatible with FV, UBV or VG



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
www.americanelectriclighting.com
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Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

ACP1LED Series

American Compact LED Floodlight

Performance Packages

ACP1 LED	Distribution	Lumens	Input operating Amps						Input Watts	LPW
		4K	120V	208V	240V	277V	347V	480V		
04 10A			1.48	0.86	0.76	0.67	0.52	0.40		
	55	21,622							177	122
	65	21,903							177	124
	66	21,635							177	122
ACP1 LED	Distribution	Lumens	Input operating Amps						Input Watts	LPW
		4K	120V	208V	240V	277V	347V	480V		
05 10A			1.83	1.07	0.93	0.82	0.64	0.48		
	55	26,903							219	123
	65	27,250							219	124
	66	26,919							219	123
ACP1LED	Distribution	Lumens	Input operating Amps						Input Watts	LPW
		4K	120V	208V	240V	277V	347V	480V		
06 10A			2.18	1.27	1.11	0.97	0.76	0.56		
	55	31,984							261	123
	65	32,396							261	124
	66	32,003							261	123



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www.americanelectriclighting.com
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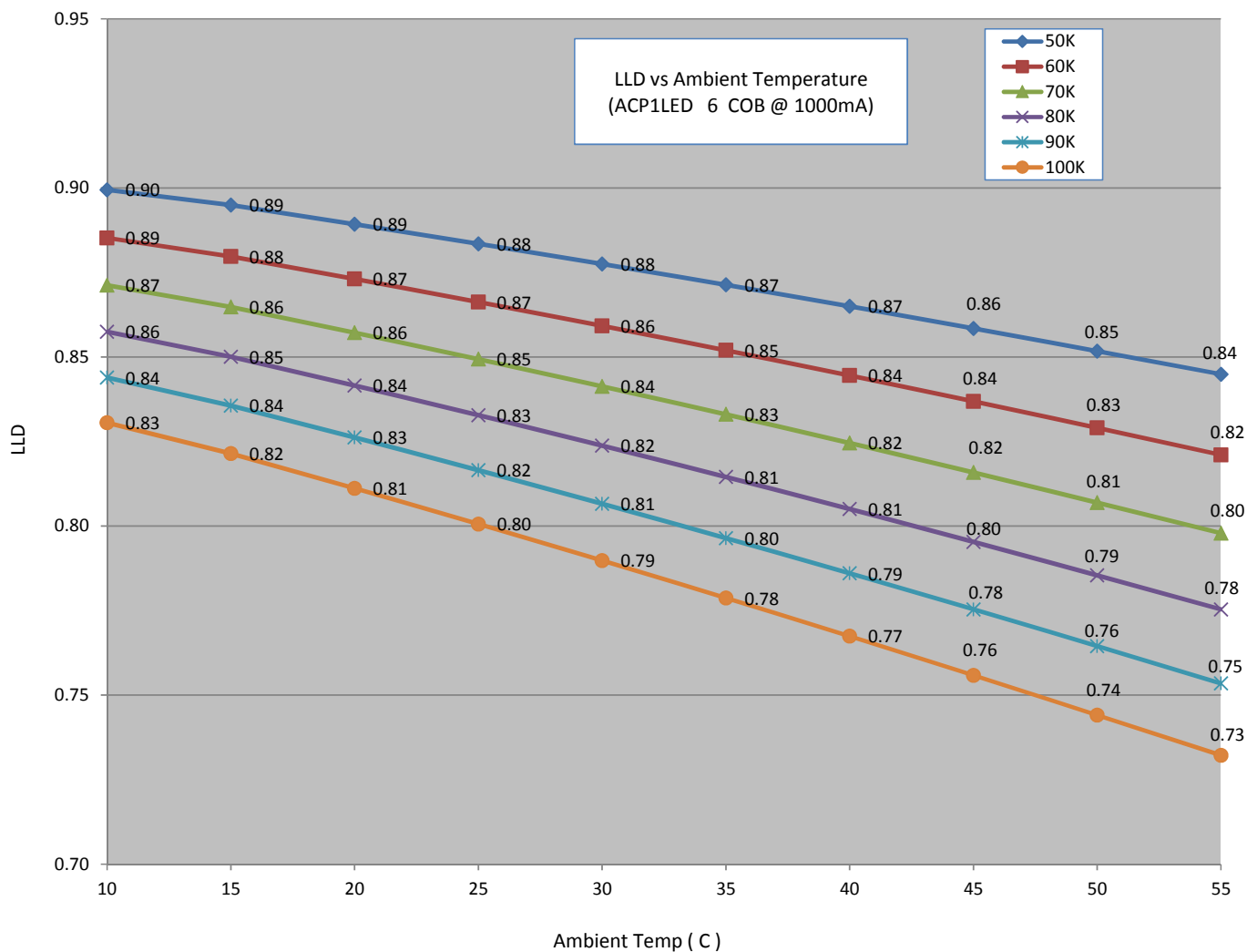
Warranty Five-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
 Actual performance may differ as a result of end-user environment and application.
 All values are design or typical values, measured under laboratory conditions at 25 °C.
 Specifications subject to change without notice.

Please contact your sales representative for the latest product information.

ACP1LED Series

American Compact LED Floodlight

DESIGN DATA



FLOOD PHOTOMETRIC REPORT

CATALOG: ACP1LED 6 10A XXX 66 4K

TEST #: 502011P40
 TEST LAB: SCALED PHOTOMETRY
 TEST NOTES: SCALED FROM ABSOLUTE TEST: 502011_S AND BASED ON NOMINAL SYSTEM PERFORMANCE.

TEST DATE: 9/12/2016

CATALOG: ACP1LED 6 10A XXX 66 4K

DESCRIPTION: ACP1 LED WITH 6 COBS, 4000K COLOR TEMPERATURE , 1050MA DRIVE CURRENT , 6X6 DISTRIBUTION

SERIES: FLOODS-ACP LED

LAMP CATALOG: COB

LAMP: LED

LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 32002.5, **ABSOLUTE PHOTOMETRY ***

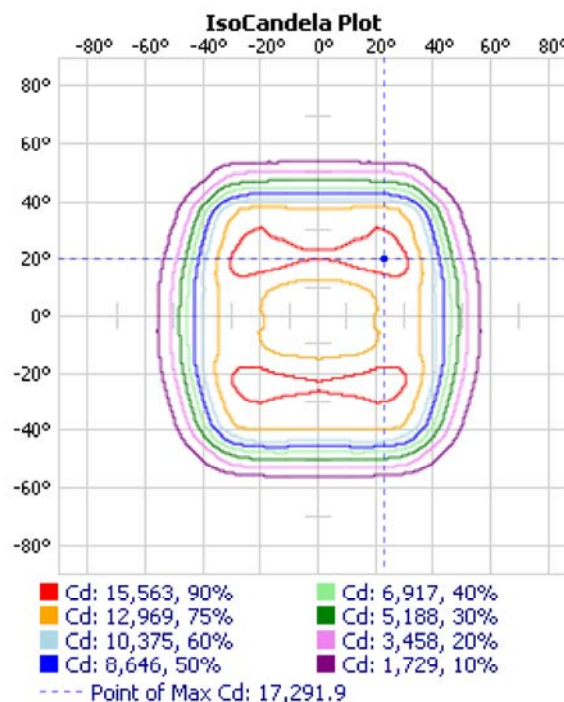
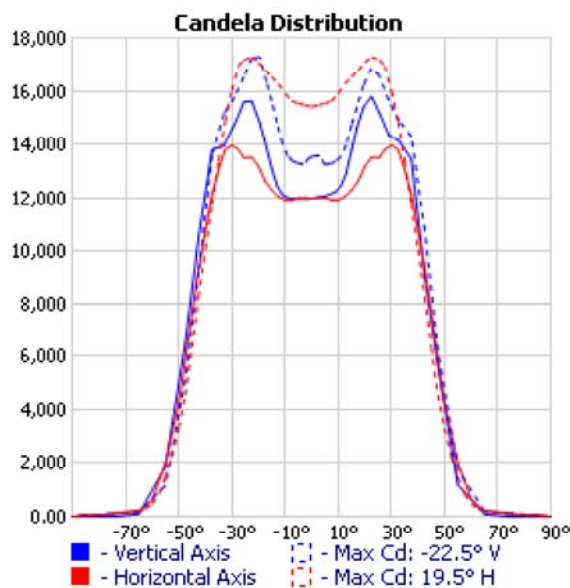
BALLAST / DRIVER: LED DRIVER, LED DRIVER

INPUT WATTAGE: 261

LUMINOUS OPENING: RECTANGLE (L: 8.76", W: 13.56")

NEMA TYPE: 6 X 6

Max Cd: 17,291.9 AT HORIZONTAL: -22.5°, VERTICAL: 19.5°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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502011P40
 VISUAL PHOTOMETRIC TOOL

PUBLISH
 PAGE 1 OF 3

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A XXX 66 4K



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	11,725.1	36.6%
0-40	20,814.8	65%
0-60	31,366.0	98%
60-90	646.5	2%
0-90	32,012.5	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	1,148.4	3.6%
10-20	3,669.2	11.5%
20-30	6,907.5	21.6%
30-40	9,089.7	28.4%
40-50	7,597.1	23.7%
50-60	2,954.2	9.2%
60-70	474.1	1.5%
70-80	118.6	0.4%
80-90	53.8	0.2%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	97.1%	31,071.5	108.3	109.1
Beam (50%):	82.3%	26,337.9	83.9	88
Total:	100%	32,002.5		

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A XXX 66 4K



CANDELA TABLE - TYPE B

	-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	78	179	624	4215	10758	13969	13166	11920	11983	11920	13166	13969	10758	4215	624	179	78	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 INTRODUCTION

1.1 Product Description

The Full Visor is intended to limit the light directed to the sides and above/below the luminaire, and the Upper/Bottom Visor is intended to limit the light directed above or below the luminaire. Each kit, ACP1LED FV and ACP1LED UBV for the medium and ACP2LED FV and ACP2LED UBV for the large, consists of a visor and (4) #8 screws.

2 INSTALLATION

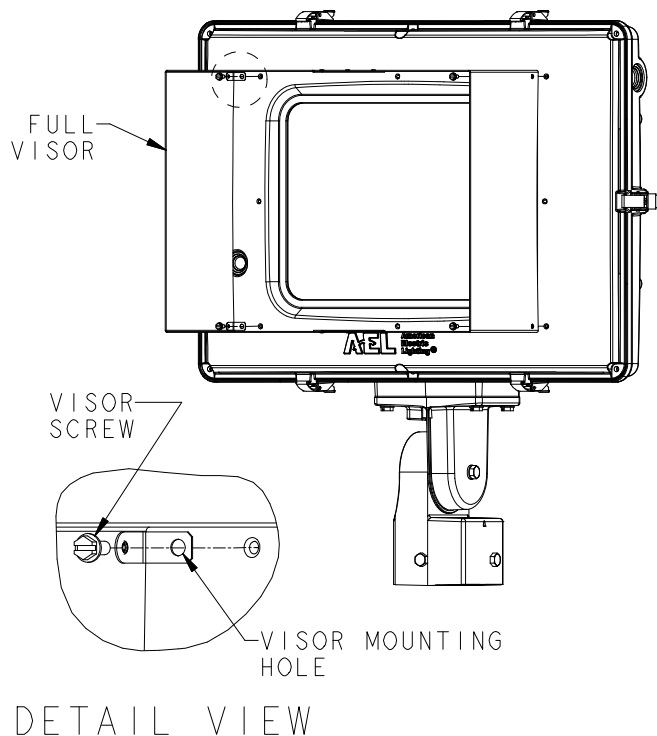
2.1 Tools and Materials Required.

DESCRIPTION	USE
1/4" Socket or Nut Driver	Visor Screws

2.2 Full Visor Installation.

Install the provided screws through the visor mounting holes and into the mounting holes on the door as shown in Figure 1.

Figure 1

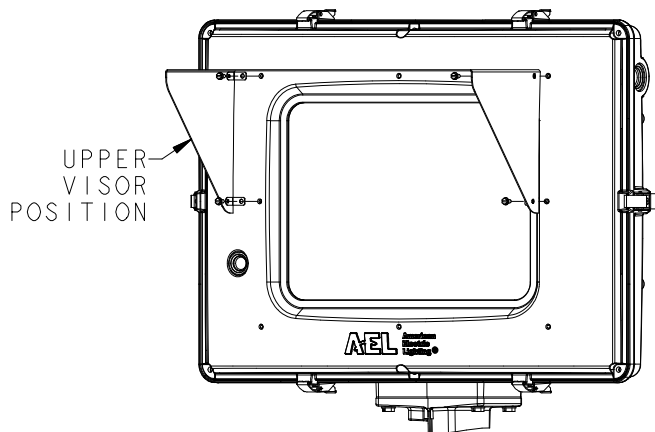


GR2287

2.3 Upper/Bottom Visor Installation.

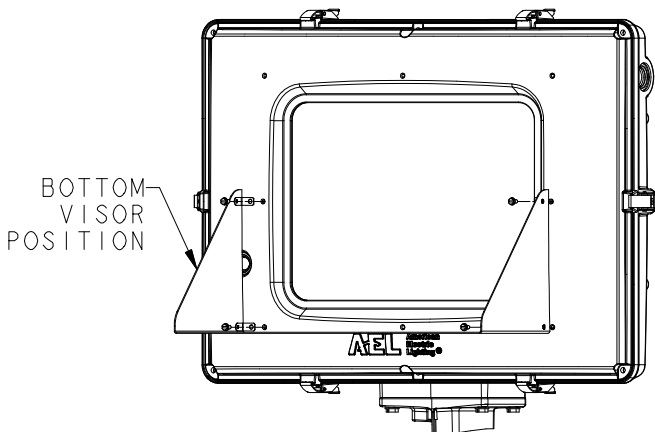
Orient the visor to the desired position, and then install the provided screws through the visor mounting holes and into the mounting holes on the door as shown in Figures 2 or 3.

Figure 2



GR2288

Figure 3

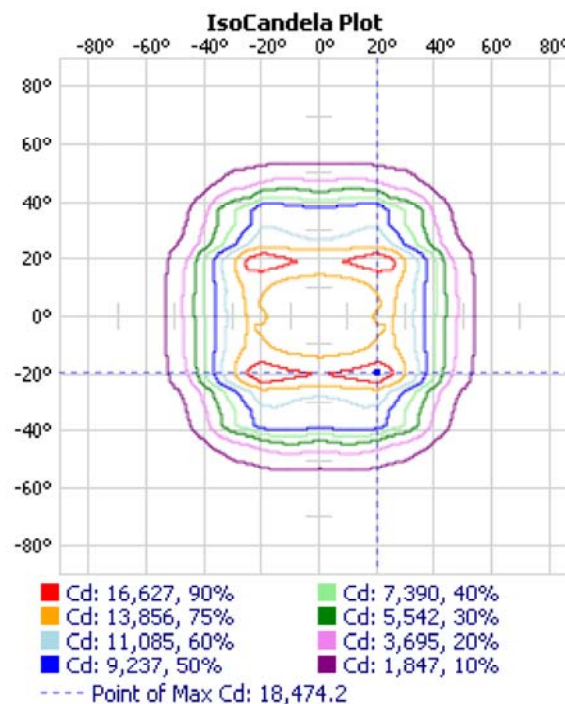
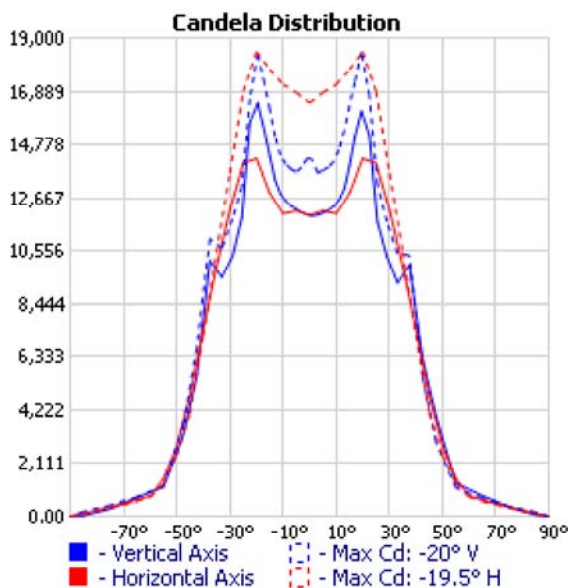


GR2289

FLOOD PHOTOMETRIC REPORT

CATALOG: ACP1LED 6 10A 66 4K-FV

TEST #: 502156P1
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 9/12/2016
 CATALOG: ACP1LED 6 10A 66 4K-FV
 DESCRIPTION: ACP1LED VISOR WITH 6 COBS 4000K COLOR
 TEMPERATURE 1050MA DRIVER CURRENT 6X6
 DISTRIBUTION
 SERIES: FLOODS-ACP LED
 LAMP CATALOG: LED ARRAY
 LAMP: LED COB
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 26619.6, **ABSOLUTE
 PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 261
 LUMINOUS OPENING: RECTANGLE (L: 9", W: 14.52")
 NEMA TYPE: 6 X 6
 Max Cd: 18,474.2 AT HORIZONTAL: -20°, VERTICAL: -19.5°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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VISUAL PHOTOMETRIC TOOL

PUBLISH
PAGE 1 OF 3

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A 66 4K-FV



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	11,812.4	44.3%
0-40	18,778.3	70.5%
0-60	25,314.4	95%
60-90	1,326.8	5%
0-90	26,641.2	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	1,170.1	4.4%
10-20	3,864.2	14.5%
20-30	6,778.0	25.4%
30-40	6,965.9	26.1%
40-50	4,723.6	17.7%
50-60	1,812.5	6.8%
60-70	737.2	2.8%
70-80	419.0	1.6%
80-90	170.6	0.6%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	93.1%	24,789.9	105.3	105.2
Beam (50%):	67.7%	18,032.6	73.8	78.3
Total:	99.9%	26,619.6		

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A 66 4K-FV



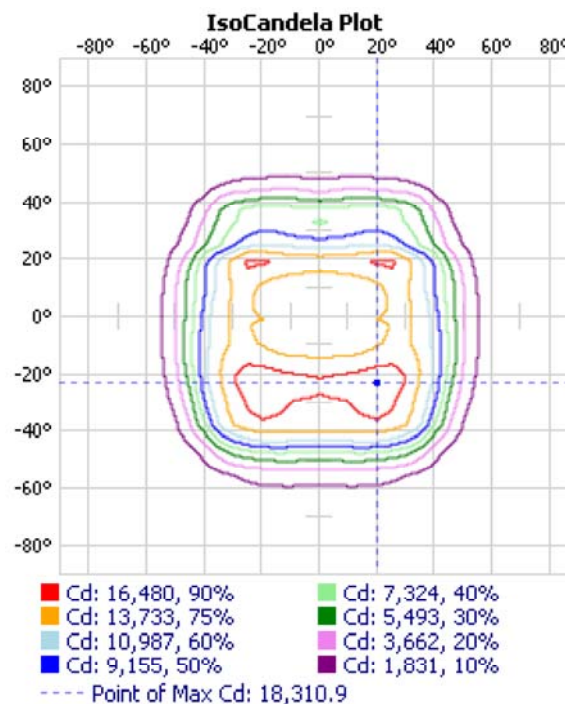
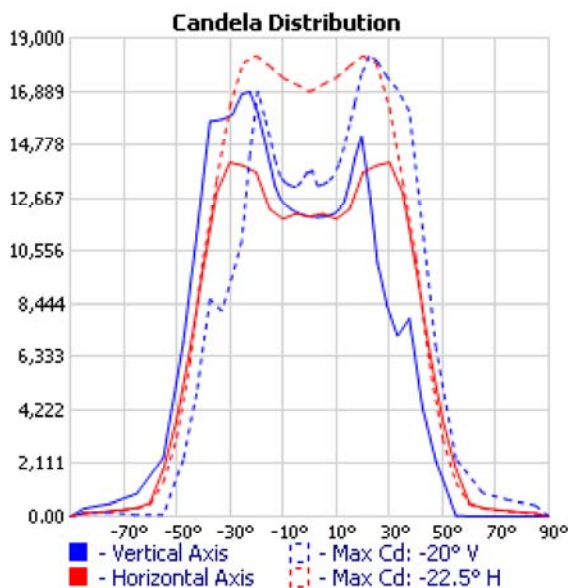
CANDELA TABLE - TYPE B

	-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	248	520	805	2796	7450	12206	14237	12049	11986	12049	14237	12206	7450	2796	805	520	248	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FLOOD PHOTOMETRIC REPORT

CATALOG: ACP1LED 6 10A 66 4K-UBV

TEST #: 502155P1
 TEST LAB: SCALED PHOTOMETRY
 TEST DATE: 9/12/2016
 CATALOG: ACP1LED 6 10A 66 4K-UBV
 DESCRIPTION: ACP1LED VISOR WITH 6 COBS 4000K COLOR
 TEMPERATURE 1050MA DRIVER CURRENT 6X6
 DISTRIBUTION
 SERIES: FLOODS-ACP LED
 LAMP CATALOG: LED ARRAY
 LAMP: LED COB
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 29566.1, **ABSOLUTE
 PHOTOMETRY ***
 BALLAST / DRIVER: LED DRIVER, LED DRIVER
 INPUT WATTAGE: 261
 LUMINOUS OPENING: RECTANGLE (L: 9", W: 14.52")
 NEMA TYPE: 6 X 6
 Max Cd: 18,310.9 AT HORIZONTAL: -20°, VERTICAL: -22.5°



*TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.

*CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.

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502155P1
VISUAL PHOTOMETRIC TOOL

PUBLISH
PAGE 1 OF 3

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A 66 4K-UBV



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	11,648.1	39.4%
0-40	19,801.4	66.9%
0-60	28,546.6	96.5%
60-90	1,040.7	3.5%
0-90	29,587.3	100%

LUMENS PER ZONE

Zone	Lumens	% Total
0-10	1,151.6	3.9%
10-20	3,719.6	12.6%
20-30	6,776.9	22.9%
30-40	8,153.3	27.6%
40-50	6,355.6	21.5%
50-60	2,389.6	8.1%
60-70	554.2	1.9%
70-80	302.8	1.0%
80-90	183.7	0.6%

FLOOD SUMMARY

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	94.9%	28,074.0	107.3	107.5
Beam (50%):	73.6%	21,786.4	82.7	75.1
Total:	99.9%	29,566.1		

FLOOD PHOTOMETRIC REPORT
 CATALOG: ACP1LED 6 10A 66 4K-UBV



CANDELA TABLE - TYPE B

	-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	170	276	541	3844	9864	14076	13673	11828	11926	11828	13673	14076	9864	3844	541	276	170	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Attachment G

Redline and Clean Versions of

MN 11.07 LED Street Lighting - Electric Rate Schedules

MN 12.00 Purchase Power Rider – Availability Matrix

MN 13.00 Mandatory Rider – Applicability Matrix

MN 14.00 Voluntary Rider – Availability Matrix

MN Index



Fergus Falls, Minnesota

LED STREET and AREA LIGHTING – DUSK TO DAWN

DESCRIPTION	RATE CODE
LED Outdoor Lighting	31-730
LED Flood Lighting	31-732
Aluminum Alloy Poles	31-734
LED Flood Visor	31-735

RULES AND REGULATIONS: Terms and conditions of this electric rate schedule and the General Rules and Regulations govern use of this service.

APPLICATION OF SCHEDULE: This schedule is applicable to any Customer for automatically operated dusk to dawn outdoor lighting supplied and operated by the Company.

RATE:

LED TYPE	Approximate Lumens	Approximate Wattage	Monthly Charge
LED5	5175	47	\$8.68
LED8	9003	76	\$15.55
LED3PT	2759	26	\$10.41
LED5PT	5404	47	\$13.37
LED10	12388	95	\$17.41
LED13	16691	133	\$21.80
LED20 - Flood	23067	199	\$21.82
LED30 - Flood	32003	261	\$40.77

Appropriate standard wood pole is included in the Monthly Charge

ALUMINUM ALLOY POLES	Additional Monthly Charge
STANDARDS 30'	\$23.11
STANDARDS 40'	\$21.53

LED FLOOD VISOR	Additional Monthly Charge
Lighting Visor LED 20-Flood	\$0.76
Lighting Visor LED 30-Flood	\$1.38



Fergus Falls, Minnesota

INTERIM RATE ADJUSTMENT:

A 9.56 percent increase will be added to the sum of the following, as applicable: Customer Charge, Energy Charge, Demand Charge, Fixed Charge, Facilities Charge, and the monthly Minimum Charge.

MANDATORY AND VOLUNTARY RIDERS: The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply and by any Voluntary Rate Riders selected by the Customer, unless otherwise noted in this rate schedule. See Sections 12.00, 13.00 and 14.00 of the Minnesota electric rates for the matrices of riders.

SEASONAL CUSTOMERS: Seasonal Customers will be billed at the same rate as year-around Customers, except as follows:

A fixed charge of \$27.59 will be billed each Seasonal Customer once per season per fixture in addition to the rate provided above. The fixed charge will be included in the first bill rendered for each season.

Each Seasonal Customer will be billed for the number of months each season that the outdoor lighting fixture is in use, but not less than a minimum of four months, plus the seasonal fixed charge.

UNDERGROUND SERVICE: If the Customer requests underground service to any outdoor lighting unit, the Company will supply up to 200 feet of wire and add an additional \$2.12 to the monthly rate specified above. If overhead service is not available, there is no additional charge. There is no additional charge for LED5PT or LED3PT fixtures, or fixtures mounted on Aluminum Alloy Standards.

EQUIPMENT AND OVERHEAD SERVICE SUPPLIED BY THE COMPANY: The light shall be mounted on a suitable new or existing Company-owned pole. Any extension beyond an average installation length of 150' will be at the expense of the Customer.

The Company will install, own and operate, and have discretion to replace or upgrade a high intensity discharge light including suitable reflector or a flood light including a lamp, or a bracket for mounting on wood poles with overhead wiring and photo-electric or other device to control operating hours. Customers provided with pole top fixtures on fiberglass poles and fixtures mounted on Aluminum Alloy Standards will not receive overhead power supply. The light shall operate from dusk to dawn. The Company will supply the necessary electricity and maintenance for the unit.

SERVICE CONDITIONS: Lighting will not be mounted on Customer-owned property. The light shall be mounted upon a suitable new or existing Company-owned facility. The Company shall own, operate, and maintain the lighting unit including the pole, fixture, lamp, ballast,



Fergus Falls, Minnesota

Interim
Minnesota Public Utilities Commission
Section 11.07
ELECTRIC RATE SCHEDULE
LED Street Lighting
Page 3 of 3
Original

photoelectric control, mounting brackets, fixture arrester, LED driver and all necessary wiring
using the Company's standard street lighting equipment. The Company shall furnish all electric
Energy required for operation of the unit.

N
N
N

In cases of vandalism or damages, the Company has the discretion to discontinue service and
remove Company equipment.

N
N




Fergus Falls, Minnesota

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Section 12.00
ELECTRIC RATE SCHEDULE
Purchase Power Riders – Availability Matrix

Page 1 of 1
~~First~~ Second Revision

PURCHASE POWER RIDERS - AVAILABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.


 Availability Matrix		Purchase Power Riders	Net Energy Billing	Simultaneous Purchase & Sale Billing Rate	Time of Day Purchase Rates	Distributed Generation Service Rider	Community-Based Energy Development Rider
Base Tariffs	Section Numbers		12.01	12.02	12.03	12.04	12.05
RESIDENTIAL & FARM SERVICES							
Residential Service	9.01	✓	✓	✓	✓	✓	✓
Residential Demand Control Service	9.02	✓	✓	✓	✓	✓	✓
Farm Service	9.03	✓	✓	✓	✓	✓	✓
GENERAL SERVICES							
Small General Service (Under 20 kW)	10.01	✓	✓	✓	✓	✓	✓
General Service (20 kW or Greater)	10.02	✓	✓	✓	✓	✓	✓
General Service - Time of Use	10.03	✓	✓	✓	✓	✓	✓
Large General Service	10.04	✓	✓	✓	✓	✓	✓
Large General Service - Time of Day	10.05	✓	✓	✓	✓	✓	✓
OTHER SERVICES							
Standby Service	11.01			✓	✓	✓	
Irrigation Service	11.02						
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03						
Outdoor Lighting - Dusk to Dawn	11.04						
Municipal Pumping Service	11.05	✓	✓	✓	✓	✓	✓
Civil Defense - Fire Sirens	11.06						
<u>LED Street and Area Lighting</u>	<u>11.07</u>						
Key:		✓ = May apply	■ = Mandatory	□ = Not Applicable			



Fergus Falls, Minnesota

PURCHASE POWER RIDERS - AVAILABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.

 Availability Matrix		Purchase Power Riders	Net Energy Billing	Simultaneous Purchase & Sale Billing Rate	Time of Day Purchase Rates	Distributed Generation Service Rider	Community-Based Energy Development Rider
Base Tariffs	Section Numbers	12.01	12.02	12.03	12.04	12.05	
RESIDENTIAL & FARM SERVICES							
Residential Service	9.01	✓	✓	✓	✓	✓	
Residential Demand Control Service	9.02	✓	✓	✓	✓	✓	
Farm Service	9.03	✓	✓	✓	✓	✓	
GENERAL SERVICES							
Small General Service (Under 20 kW)	10.01	✓	✓	✓	✓	✓	
General Service (20 kW or Greater)	10.02	✓	✓	✓	✓	✓	
General Service - Time of Use	10.03	✓	✓	✓	✓	✓	
Large General Service	10.04	✓	✓	✓	✓	✓	
Large General Service - Time of Day	10.05	✓	✓	✓	✓	✓	
OTHER SERVICES							
Standby Service	11.01			✓	✓	✓	
Irrigation Service	11.02						
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03						
Outdoor Lighting - Dusk to Dawn	11.04						
Municipal Pumping Service	11.05	✓	✓	✓	✓	✓	
Civil Defense - Fire Sirens	11.06						
LED Street and Area Lighting	11.07						
Key:		✓ = May apply	■ = Mandatory	□ = Not Applicable			

N



Fergus Falls, Minnesota

Minnesota Public Utilities Commission
Section 13.00
ELECTRIC RATE SCHEDULE
Mandatory Riders – Applicability Matrix

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~~Third~~ Fourth Revision

MANDATORY RIDERS - APPLICABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.

Applicability Matrix		Mandatory Riders	Energy Adjustment Rider	Conservation Improvement (CIP) Rider	Competitive Rate to Large General Service Rider	Renewable Resource Cost Recovery Rider	Transmission Cost Recovery Rider	Reserved for Future Use	Reserved for Future Use	Environmental Cost Recovery Rider
Tariffs	Section Numbers	13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08	
RESIDENTIAL & FARM SERVICES										
Residential Service	9.01									
Residential Demand Control Service	9.02									
Farm Service	9.03									
GENERAL SERVICES										
Small General Service (Under 20 kW)	10.01									
General Service (20 kW or Greater)	10.02				✓					
General Service - Time of Use	10.03				✓					
Large General Service	10.04				✓					
Large General Service - Time of Day	10.05				✓					
OTHER SERVICES										
Standby Service	11.01									
Irrigation Service	11.02									
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03									
Outdoor Lighting - Dusk to Dawn	11.04									
Municipal Pumping Service	11.05				✓					
Civil Defense - Fire Sirens	11.06									
LED Street and Area Lighting	11.07									
Key: ✓ = May apply ■ = Mandatory □ = Not Applicable										

N



Fergus Falls, Minnesota

Minnesota Public Utilities Commission
Section 13.00
ELECTRIC RATE SCHEDULE
Mandatory Riders – Applicability Matrix

Page 2 of 2
~~Third~~Fourth Revision

Applicability Matrix									
	Mandatory Riders	Energy Adjustment Rider	Conservation Improvement (CIP) Rider	Competitive Rate to Large General Service Rider	Renewable Resource Cost Recovery Rider	Transmission Cost Recovery Rider	Reserved for Future Use	Reserved for Future Use	Environmental Cost Recovery Rider
Tariffs	Section Numbers	13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08
MANDATORY RIDERS									
Energy Adjustment Rider	13.01								
Conservation Improvement (CIP) Rider	13.02								
Competitive Rate to Large General Service Rider	13.03								
Renewable Cost Recovery Rider	13.04								
Transmission Cost Recovery Rider	13.05								
Reserved for Future Use	13.06								
Reserved for Future Use	13.07								
Environmental Cost Recovery Rider	13.08								
VOLUNTARY RIDERS									
Water Heating Control Rider	14.01								
Real Time Pricing Rider	14.02								
Large General Service Rider	14.03	✓							
Controlled Service - Interruptible Load (CT Metering) Rider	14.04								
Controlled Service - Interruptible Load (Self-Contained Metering) Rider	14.05								
Controlled Service - Deferred Load Rider	14.06								
Fixed Time of Service Rider	14.07								
Air Conditioning Control Rider	14.08								
Renewable Energy Rider	14.09								
WAPA Bill Crediting Program Rider	14.10								
Released Energy Rider	14.11								
Off-Peak Electric Vehicle Rider	14.12								
Key: ✓ = May apply ■ = Mandatory □ = Not Applicable									

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Fergus Falls, Minnesota

Minnesota Public Utilities Commission
Section 13.00
ELECTRIC RATE SCHEDULE
Mandatory Riders – Applicability Matrix

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MANDATORY RIDERS - APPLICABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.

Applicability Matrix		Mandatory Riders	Energy Adjustment Rider	Conservation Improvement (CIP) Rider	Competitive Rate to Large General Service Rider	Renewable Resource Cost Recovery Rider	Transmission Cost Recovery Rider	Reserved for Future Use	Reserved for Future Use	Environmental Cost Recovery Rider
Tariffs	Section Numbers		13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08
RESIDENTIAL & FARM SERVICES										
Residential Service	9.01									
Residential Demand Control Service	9.02									
Farm Service	9.03									
GENERAL SERVICES										
Small General Service (Under 20 kW)	10.01									
General Service (20 kW or Greater)	10.02				✓					
General Service - Time of Use	10.03				✓					
Large General Service	10.04				✓					
Large General Service - Time of Day	10.05				✓					
OTHER SERVICES										
Standby Service	11.01									
Irrigation Service	11.02									
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03									
Outdoor Lighting - Dusk to Dawn	11.04									
Municipal Pumping Service	11.05				✓					
Civil Defense - Fire Sirens	11.06									
LED Street and Area Lighting	11.07									
Key: ✓ = May apply ■ = Mandatory □ = Not Applicable										


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Fergus Falls, Minnesota

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ELECTRIC RATE SCHEDULE
Mandatory Riders – Applicability Matrix

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 Applicability Matrix									
	Mandatory Riders	Energy Adjustment Rider	Conservation Improvement (CIP) Rider	Competitive Rate to Large General Service Rider	Renewable Resource Cost Recovery Rider	Transmission Cost Recovery Rider	Reserved for Future Use	Reserved for Future Use	Environmental Cost Recovery Rider
Tariffs	Section Numbers	13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08
MANDATORY RIDERS									
Energy Adjustment Rider	13.01								
Conservation Improvement (CIP) Rider	13.02								
Competitive Rate to Large General Service Rider	13.03								
Renewable Cost Recovery Rider	13.04								
Transmission Cost Recovery Rider	13.05								
Reserved for Future Use	13.06								
Reserved for Future Use	13.07								
Environmental Cost Recovery Rider	13.08								
VOLUNTARY RIDERS									
Water Heating Control Rider	14.01								
Real Time Pricing Rider	14.02								
Large General Service Rider	14.03	✓							
Controlled Service - Interruptible Load (CT Metering) Rider	14.04								
Controlled Service - Interruptible Load (Self-Contained Metering) Rider	14.05								
Controlled Service - Deferred Load Rider	14.06								
Fixed Time of Service Rider	14.07								
Air Conditioning Control Rider	14.08								
Renewable Energy Rider	14.09								
WAPA Bill Crediting Program Rider	14.10								
Released Energy Rider	14.11								
Off-Peak Electric Vehicle Rider	14.12								
Key: ✓ = May apply ■ = Mandatory □ = Not Applicable									

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Fergus Falls, Minnesota

Minnesota Public Utilities Commission
Section 14.00
ELECTRIC RATE SCHEDULE
Voluntary Riders – Availability Matrix

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~~Third~~ Fourth Revision

VOLUNTARY RIDERS - AVAILABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.

<div><div>Availability Matrix</div></div>		Voluntary Riders	Water Heating Control Rider	Real Time Pricing Rider	Large General Service Rider	Controlled Service - Interruptible Load (CT Metering) Rider	Controlled Service - Interruptible Load (Self-Contained Metering) Rider	Controlled Service - Deferred Load Rider	Fixed Time of Service Rider	Air Conditioning Control Rider	Renewable Energy Rider	WAPA Bill Crediting Program Rider	Released Energy Rider	Off-Peak Electric Vehicle Rider
Base Tariffs	Section Numbers	14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08	14.09	14.10	14.11	14.12	
RESIDENTIAL & FARM SERVICES														
Residential Service	9.01	✓			✓	✓	✓	✓	✓	✓	✓		✓	
Residential Demand Control Service	9.02	✓							✓	✓	✓		✓	
Farm Service	9.03	✓			✓	✓	✓	✓	✓	✓	✓		✓	
GENERAL SERVICES														
Small General Service (Under 20 kW)	10.01	✓			✓	✓	✓	✓	✓	✓	✓		✓	
General Service (20 kW or Greater)	10.02	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
General Service - Time of Use	10.03	✓	✓							✓	✓	✓	✓	
Large General Service	10.04	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Large General Service - Time of Day	10.05	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
OTHER SERVICES														
Standby Service	11.01													
Irrigation Service	11.02										✓			
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03										✓			
Outdoor Lighting - Dusk to Dawn	11.04										✓			
Municipal Pumping Service	11.05	✓	✓		✓	✓	✓	✓		✓	✓		✓	
Civil Defense - Fire Sirens	11.06													
LED Area and Street Lighting	11.07										✓			
Key:		✓ = May apply	■ = Mandatory	□ = Not Applicable										

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Fergus Falls, Minnesota

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ELECTRIC RATE SCHEDULE
Voluntary Riders – Availability Matrix

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VOLUNTARY RIDERS - AVAILABILITY MATRIX

The amount of a bill for service will be modified by any Mandatory Rate Riders that must apply, by any Voluntary Rate Riders selected by the Customer, and charges listed in the General Rules and Regulations.

 Availability Matrix													
Voluntary Riders		Water Heating Control Rider	Real Time Pricing Rider	Large General Service Rider	Controlled Service - Interruptible Load (CT Metering) Rider	Controlled Service - Interruptible Load (Self-Contained Metering) Rider	Controlled Service - Deferred Load Rider	Fixed Time of Service Rider	Air Conditioning Control Rider	Renewable Energy Rider	WAPA Bill Crediting Program Rider	Released Energy Rider	Off-Peak Electric Vehicle Rider
Base Tariffs	Section Numbers	14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08	14.09	14.10	14.11	14.12
RESIDENTIAL & FARM SERVICES													
Residential Service	9.01	✓			✓	✓	✓	✓	✓	✓	✓		✓
Residential Demand Control Service	9.02	✓							✓	✓	✓		✓
Farm Service	9.03	✓			✓	✓	✓	✓	✓	✓	✓		✓
GENERAL SERVICES													
Small General Service (Under 20 kW)	10.01	✓			✓	✓	✓	✓	✓	✓	✓		✓
General Service (20 kW or Greater)	10.02	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
General Service - Time of Use	10.03	✓	✓							✓	✓	✓	✓
Large General Service	10.04	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Large General Service - Time of Day	10.05	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
OTHER SERVICES													
Standby Service	11.01												
Irrigation Service	11.02										✓		
Outdoor Lighting - Energy Only - Dusk to Dawn	11.03										✓		
Outdoor Lighting - Dusk to Dawn	11.04										✓		
Municipal Pumping Service	11.05	✓	✓		✓	✓	✓	✓		✓	✓		✓
Civil Defense - Fire Sirens	11.06												
LED Area and Street Lighting	11.07										✓		
Key:		✓ = May apply	■ = Mandatory	□ = Not Applicable									

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Fergus Falls, Minnesota

Minnesota Public Utilities Commission
ELECTRIC RATE SCHEDULE

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11.00 OTHER SERVICES

11.01	Standby Service
11.02	Irrigation Service
11.03	Outdoor Lighting – Energy Only – Dusk to Dawn
11.04	Outdoor Lighting – Dusk to Dawn <u>(CLOSED)</u>
11.05	Municipal Pumping Service
11.06	Civil Defense - Fire Sirens
<u>11.07</u>	<u>LED Street and Area Lighting – Dusk to Dawn</u>

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12.00 PURCHASE POWER RIDERS AND AVAILABILITY MATRIX

12.01	Small Power Producer Rider (Net Energy Billing Rate)
12.02	Small Power Producer Rider (Simultaneous Purchase and Sale Billing Rate)
12.03	Small Power Producer Rider (Time-of-Day Purchase Rates)
12.04	Distributed Generation Service Rider
12.05	Community-Based Energy Development (C-BED) Tariff

13.00 MANDATORY RIDERS AND APPLICABILITY MATRIX

13.01	Energy Adjustment Rider <ul style="list-style-type: none"> Applicable to <u>all</u> services and riders unless otherwise stated in the mandatory riders matrix
13.02	Conservation Improvement Project (CIP) Rider <ul style="list-style-type: none"> Applicable to <u>all</u> services unless otherwise stated in the mandatory riders matrix
13.03	Competitive Rate Rider - Large General Service
13.04	Renewable Resource Cost Recovery Rider
13.05	Transmission Cost Recovery Rider
13.06	Reserved for Future Use
13.07	Reserved for Future Use
13.08	Environmental Cost Recovery Rider

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Fergus Falls, Minnesota

Section

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11.00 OTHER SERVICES

11.01	Standby Service
11.02	Irrigation Service
11.03	Outdoor Lighting – Energy Only – Dusk to Dawn
11.04	Outdoor Lighting – Dusk to Dawn (CLOSED)
11.05	Municipal Pumping Service
11.06	Civil Defense - Fire Sirens
11.07	LED Street and Area Lighting – Dusk to Dawn

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12.00 PURCHASE POWER RIDERS AND AVAILABILITY MATRIX

12.01	Small Power Producer Rider (Net Energy Billing Rate)
12.02	Small Power Producer Rider (Simultaneous Purchase and Sale Billing Rate)
12.03	Small Power Producer Rider (Time-of-Day Purchase Rates)
12.04	Distributed Generation Service Rider
12.05	Community-Based Energy Development (C-BED) Tariff

13.00 MANDATORY RIDERS AND APPLICABILITY MATRIX

13.01	Energy Adjustment Rider <ul style="list-style-type: none"> Applicable to <u>all</u> services and riders unless otherwise stated in the mandatory riders matrix
13.02	Conservation Improvement Project (CIP) Rider <ul style="list-style-type: none"> Applicable to <u>all</u> services unless otherwise stated in the mandatory riders matrix
13.03	Competitive Rate Rider - Large General Service
13.04	Renewable Resource Cost Recovery Rider
13.05	Transmission Cost Recovery Rider
13.06	Reserved for Future Use
13.07	Reserved for Future Use
13.08	Environmental Cost Recovery Rider

Attachment H
Redline and Clean Versions of
MN 11.04 Outdoor Lighting - Electric Rate Schedules



Fergus Falls, Minnesota

OUTDOOR LIGHTING DUSK TO DAWN

DESCRIPTION	RATE CODE
Outdoor Lighting – <u>CLOSED TO NEW INSTALLATIONS</u>	31-745
Floodlighting – <u>CLOSED TO NEW INSTALLATIONS</u>	31-746

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RULES AND REGULATIONS: Terms and conditions of this electric rate schedule and the General Rules and Regulations govern use of this service.

APPLICATION OF SCHEDULE: This schedule is applicable to any Customer for automatically operated dusk to dawn outdoor lighting supplied and operated by the Company.

RATE:

<u>Unit type</u>	<u>Lumens</u>	<u>Wattage</u>	<u>Monthly Charge</u>
MV-6*	6000	175	\$7.20
MV-6PT*	6000	175	\$9.37
MV-11*	11000	250	\$13.43
MV-21*	21000	400	\$17.40
MV-35*	35000	750	\$26.25
MV-55*	55000	1000	\$36.08
MH-8	8500	100	\$8.14
MH-8PT	8500	100	\$11.54
MH-14	14000	175	\$15.49
MH-20	20500	250	\$17.71
MH-36	36000	400	\$17.47
MH-110	110000	1000	\$37.35
HPS-9	9000	100	\$7.96
HPS-9PT	9000	100	\$9.60
HPS-14	14000	150	\$12.34
HPS-14PT	14000	150	\$12.32
HPS-19	19000	200	\$14.31
HPS-23	23000	250	\$16.18
HPS-44	44000	400	\$20.09

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Fergus Falls, Minnesota

Minnesota Public Utilities Commission

Section 11.04

ELECTRIC RATE SCHEDULE

Outdoor Lighting

Dusk to Dawn

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Eighteenth Revision

**OUTDOOR LIGHTING
DUSK TO DAWN**

DESCRIPTION	RATE CODE
Outdoor Lighting – CLOSED TO NEW INSTALLATIONS	31-745
Floodlighting – CLOSED TO NEW INSTALLATIONS	31-746

C
C

RULES AND REGULATIONS: Terms and conditions of this electric rate schedule and the General Rules and Regulations govern use of this service.

APPLICATION OF SCHEDULE: This schedule is applicable to any Customer for automatically operated dusk to dawn outdoor lighting supplied and operated by the Company.

RATE:

<u>Unit type</u>	<u>Lumens</u>	<u>Wattage</u>	<u>Monthly Charge</u>
MV-6*	6000	175	\$7.20
MV-6PT*	6000	175	\$9.37
MV-11*	11000	250	\$13.43
MV-21*	21000	400	\$17.40
MV-35*	35000	750	\$26.25
MV-55*	55000	1000	\$36.08
MH-8	8500	100	\$8.14
MH-8PT	8500	100	\$11.54
MH-14	14000	175	\$15.49
MH-20	20500	250	\$17.71
MH-36	36000	400	\$17.47
MH-110	110000	1000	\$37.35
HPS-9	9000	100	\$7.96
HPS-9PT	9000	100	\$9.60
HPS-14	14000	150	\$12.34
HPS-14PT	14000	150	\$12.32
HPS-19	19000	200	\$14.31
HPS-23	23000	250	\$16.18
HPS-44	44000	400	\$20.09

MINNESOTA PUBLIC
UTILITIES COMMISSION

Approved:
Docket No. E017/M-17-

Thomas R. Brause
Vice President, Administration

EFFECTIVE with bills rendered
on and after
June 1, 2017
in Minnesota

CERTIFICATE OF SERVICE

**RE: In the Matter of Otter Tail Power Company's Petition for Approval of the Company's proposed LED Street and Area Lighting rate schedule 11.07 and associated LED implementation plan.
Docket No. E017-M-17_**

I, Kim Ward, hereby certify that I have this day served a copy of the following, or a summary thereof, on Daniel P. Wolf and Sharon Ferguson by e-filing, and to all other persons on the attached service list by electronic service or by First Class Mail.

**Otter Tail Power Company
Initial Filing**

Dated this **22nd** day of **February, 2017**.

/s/ Kim Ward
Kim Ward, Regulatory Filing Coordinator
Otter Tail Power Company
215 South Cascade Street
Fergus Falls MN 56537
(218) 739-8268

[illegible]

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
John	Lindell	john.lindell@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012130	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Kavita	Maini	kmairi@wi.rr.com	KM Energy Consulting LLC	961 N Lost Woods Rd Oconomowoc, WI 53066	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Gary	Oetken	goetken@agp.com	Ag Processing, Inc.	12700 West Dodge Road P.O. Box 2047 Omaha, NE 681032047	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
David G.	Prazak	dprazak@otpc.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380496	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Larry L.	Schedin	Larry@LLSResources.com	LLS Resources, LLC	332 Minnesota St, Ste W1390 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Cary	Stephenson	cStephenson@otpc.com	Otter Tail Power Company	215 South Cascade Street Fergus Falls, MN 56537	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Stuart	Tommerdahl	stommerdahl@otpc.com	Otter Tail Power Company	215 S Cascade St PO Box 496 Fergus Falls, MN 56537	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	No	GEN_SL_Otter Tail Power Company_LED Rate Filing 2017