A RESOLUTION ADOPTING A STATEMENT
EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR ADOPTING AN
AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE
Resolution No. 94/2009-10

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: AN ORDINANCE REVISING ARTICLE XV THE CARRBORO LAND USE ORDINANCE WITH RESPECT TO OUTDOOR LIGHTING STANDARDS

NOW THEREFORE, the Board of Aldermen of the Town of Carrboro Resolves:

Section 1. The Board concludes that the above described amendment is consistent with Carrboro Vision 2020, policies 2.42, 2.51, 3.1, and 3.25

Section 2. The Board concludes that its adoption of the above described amendment is reasonable and in the public interest because the Town seeks to maintain its distinctive town character, support implementation of the Northern Study Area plan, minimize negative environmental impact, and improve lighting in the downtown and other areas.

Section 3. This resolution becomes effective upon adoption.

A RESOLUTION ADOPTING A STATEMENT
EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR REJECTING AN AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: AN ORDINANCE REVISING ARTICLE XV THE CARRBORO LAND USE ORDINANCE WITH RESPECT TO OUTDOOR LIGHTING STANDARDS

NOW THEREFORE, the Board of Aldermen of the Town of Carrboro Resolves:

Section 1. The Board concludes that the above described amendment is not consistent with Town policies and regulations.

Section 2. The Board concludes that its rejection of the above described amendment is reasonable and in the public interest because existing regulations are appropriate.

Section 3. This resolution becomes effective upon adoption.

****DRAFT****

AN ORDINANCE REVISING ARTICLE XV THE CARRBORO LAND USE ORDINANCE WITH RESPECT TO OUTDOOR LIGHTING STANDARDS

THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO ORDAINS:

Section 1. All references in this ordinance are to Chapter 15 of the Carrboro Town Code, the Carrboro Land Use Ordinance.

Section 2. The Title of Article XV of the Carrboro Land Use Ordinance is rewritten to read as follows:

ARTICLE XV
WATER AND WASTEWATER, OUTDOOR LIGHTING, AND MISCELLANEOUS UTILITIES
PART 1. WATER AND WASTEWATER

Section 3. The Carrboro Land Use Ordinance is amended by rewriting Sections 15-242 and 15-243 to read as follows:

PART II. OUTDOOR LIGHTING

Section 15-242 Purpose and Intent

(a) The Board finds that outdoor lighting serves a number of beneficial purposes. For work or recreation, it enables people to see essential detail in order that they may undertake their activities at night. It facilitates the safety and security of persons and property, for example through lighting on roads and pathways and the entrances to buildings. It may be used to emphasize features of architectural or historical significance, and to light parks and gardens. It is used for advertising or display to promote products or services, or to call attention to commercial premises by means of area lighting or signs. However, excessive or inappropriately directed lighting may create unwanted glare, interfere with observation of the nighttime sky, waste valuable energy supply, and otherwise interfere with the use or enjoyment of adjoining or nearby public or private property.

(b) It is the intent of this part to preserve, protect, and enhance the lawful nighttime use and enjoyment of any and all property through the use of appropriate lighting practices and systems by providing for the installation of in dividual fixtures and lighting systems that are designed and installed to maintain safety, security and productivity, and to curtail the degradation of the nighttime visual environment.

Section 15-242.1 Definitions

Unless otherwise specifically provided, or unless clearly required by the context, the words and phrases defined in this section shall have the meaning indicated when used in this part.

(1) Direct Light: Light emitted directly from the lamp, off of the reflector diffuser, or through the refractor or diffuser lens, of a luminaire.

(2) Fixture: The assembly that houses the lamp or lamps and can include all or some of the following parts: a housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and/or a refractor or lens.

(3) Floodlight: A form of lighting designated to direct its output more or less in a specific direction.

(4) Footcandle: (fc) The total amount of light or illuminance cast on a surface and equivalent to the light produced by a source of one (1) candle measured at a distance of one (1) foot

(5) Full cut-off luminaries: A luminaire designed and installed where no light is emitted at or above a horizontal plane running through the lowest point on the luminaire.

(6) Fully Shielded: Outdoor light fixtures shielded by a solid barrier so that no light escapes through the barrier

(7) Glare: Light emitting from a luminaire with an intensity great enough to reduce a viewer's ability to see, or cause annoyance and discomfort, and, in extreme cases, causing momentary blindness.

(8) IESNA: Illuminating Engineering Society of North America, a non-profit society of professional lighting specialists that has developed a series of recommended standards for a variety of lighting applications.

(9) Lamp: The component of the luminaire that produces the light and commonly referred to as the "bulb."

(10) Light Trespass: The shining of light produced by a luminaire beyond the boundaries of the property on which it is located.

(11) Lumen: The unit used to quantify the amount of light energy produced by a lamp at the lamp. Lumen output of most lamps is listed on the packaging. For example, a 60-watt incandescent lamp produces 950 lumens while a 55-watt low-pressure sodium lamp produces 8000 lumens.

(12) Luminaire: A complete lighting system that includes light source and all necessary mechanical, electrical, and decorative parts.

(13) Maintained Foot Candle: Illuminance of lighting fixtures adjusted for dirt buildup and lamp output depreciation.

(14) Wall Pack: A type of light fixture typically flush-mounted on a vertical wall surface.

Section 15-242.2 Applicability

(a) The provisions of this part apply to developments for which permits are issued after the effective date of this part; therefore developments that exist on the effective date of this part that do not comply with its provisions shall not be regarded as nonconforming. However, when new luminaries are installed or existing luminaries are replaced, they shall comply with this part.

(b) Notwithstanding the provisions of subsection (a) of this section, luminaires installed prior to the effective date of this part that violate the following provisions shall be brought into compliance or removed within three months after the date of notification of the violation: Section 15-242.5 (d).

(c) Regulations applicable to the lighting of signs are found in Article XVII of this chapter, particularly Section 15-281.

(d) The provisions of this part do not apply to:

(1) Streetlights installed on public streets.

(2) Traffic control signals and devices.

(3) Temporary emergency lighting (i.e. fire, police, repair workers, etc.).

(4) Moving vehicle lights.

(5) Navigation lights (i.e. airports, heliports, radio/television towers, etc.).

(6) Seasonal decorations with individual lights in place no longer than 60 consecutive days.

(7) Security lights that are controlled by a motion-sensor switch that does not allow the lights to remain on longer than 12 minutes after activation, so long as the lamps do not exceed 150 watts and 2,200 lumens.

Section 15-242.3 Minimum Lighting Requirements for Security

(a) All streets, sidewalks, and other common areas or facilities in subdivisions shall be sufficiently illuminated to ensure the security of property and the safety of persons using such streets, sidewalks, and other common areas or facilities.

(b) All roads, driveways, sidewalks, parking lots, and other common areas or facilities in unsubdivided developments shall be sufficiently illuminated to ensure the security of property and the safety of persons using such roads, driveways, sidewalks, and other common areas or facilities.

(c) All entrances and exits in ~~substantial~~ buildings used for non-residential purposes and in multi-family residential dwellings containing more than four dwelling units shall be adequately lighted to ensure the safety of persons and the security of such buildings.

Section 15-242.4 Subdivisions

(a) With respect to street lighting for subdivision streets that (i) are located on property within the town at or about the time of final plat approval, and (ii) are intended to be dedicated to the town, the developer shall coordinate with the electric utility company to ensure that all facilities necessary for the installation of street lights in accordance with the town's street lighting policy are put in place. "As a condition of construction plan approval, all public street lighting is to be installed by the developer prior to street acceptance by the town. The developer shall be responsible for all installation cost and monthly billing until the public streets are accepted onto the town's street maintenance system."

(b) With respect to street lighting for subdivision streets that (i) are located on property that is not within the town at or about the time of final plat approval, and (ii) are intended to be dedicated to the public (i.e. to the N.C. Department of Transportation initially and eventually to the town when the subdivision is annexed), the developer shall coordinate with the electric utility company to see that all facilities necessary for the installation of street lights in accordance with the town's street lighting policy are put in place. The installation of street lights that are consistent with town policies may then be provided for either by an arrangement between the developer or a property owners association and the electric utility company until such time as the subdivision is annexed.

(c) With respect to street lighting for subdivision streets that are not intended to be dedicated to the town, the developer shall provide for the installation and maintenance (either by the developer or a successor property owners association) of a street lighting system that will provide sufficient lighting for safety and security purposes to an extent substantially equivalent to that provided for town streets under the town's street lighting policy.

Section 15-242.5 General Standards

(a) Unless otherwise specified, under no circumstances may the light level at a lot line exceed .2 foot candles. A limitation of 2.0 footcandles shall generally apply to lot lines in the B-1(c) and B-1(g) zoning districts. However, a limitation of .2 footcandles shall apply to lot lines of properties zoned B-1(c) or B-1(g) under any of the following circumstances:

(1) Where such lot lines separate properties zoned B-1(c) or B-1(g) from properties zoned residential;

(2) If and to the extent that properties zoned residential lie directly across a street from the lot lines of properties zoned B-1(c) or B-1(g);

(3) Where such lot lines separate properties zoned B-1(c) or B-1(g) from properties that are not zoned residential but that are used for residential purposes and were so used on the effective date of this subsection;

(4) If and to the extent that properties that are not zoned residential but are used for residential purposes and were so used on the effective date of this subsection lie directly across a street from the lot lines of properties zoned B-1(c) or B-1(g).

(b) Vegetative buffers shall not be used to satisfy the standards set forth in subsection (a) of this section.

(c) Any luminaire with a lamp or lamps rated at a total of more than 1,800 lumens shall be fully shielded and shall be located to prevent glare and light trespass beyond the property boundary (including onto adjacent streets).

(d) The recommended maximum light output is 70,000 lumens per acre for lots developed for commercial or multi-family purposes and 6,500 lumens per acre for lots developed for all other purposes. This recommended maximum does not apply to those uses regulated by Sections 15-242.6, 15-242.7, and 15-242.8.

(e) Floodlights with external shielding shall be angled provided that no light is directed above a twenty-five (25) degree angle measured from the vertical line from the center of the light extended to the ground, and only if the luminaire does not cause glare or light to shine on adjacent property or public or private rights-of-way. Photocells with timers that allow a floodlight to go on at dusk and off by 11:00 p.m are encouraged.

(f) The presumptive standard for the maximum height of light poles is fifteen (15) feet in height. The Board recognizes that due to the particularities of any given development, the inflexible application of a height maximum for lighting fixtures may result in a development with excessive energy consumption or light fixtures that are incompatible with the scale or style of a development. These situations can result in a waste of money that could more desirably be used for valuable development amenities or environmentally useful features. Therefore, the permit-issuing authority may permit deviations from the presumptive requirements and may require shorter light fixtures or allow taller light fixtures whenever it finds that such deviations are more likely to satisfy the standard set forth in subsections 15-242 (a) and (b).

(1) Without limiting the generality of the foregoing, the permit-issuing authority may allow or require deviations from the light fixture height maximum set forth in Subsection 15-242.5(f) when it finds that:

a. An existing multi-family residential development is seeking to improve security and safety for residents by increasing the number of light fixtures and also seeks to utilize light fixtures that are similar in size and style to existing fixtures.

b. Lighting fixtures on neighboring property are substantially lower in height than the maximum that would be allowed and taller light fixtures would result in a discernible negative impact in terms of excessive illumination and glare.

c. New lighting complies in all other respects with the requirements of Article XV, Part II.

(2) Whenever the permit-issuing authority allows or requires a deviation from the presumptive lighting fixture height requirements set forth in Subsection 15-242.5(e) it shall enter on the face of the permit the lighting fixture height requirement that it imposes and the reasons for allowing or requiring the deviation.

(f) ~~shall be subject to the same setback requirements as are applicable to buildings.~~

(g) All wall packs shall be fully shielded.

(h) All luminaires shall be shielded or oriented in such a way as to direct light toward the earth's surface and away from reflective surfaces.

(i) Luminaires designed to illuminate building facades, architectural features, or landscaping shall be oriented and shielded so that direct illumination is focused exclusively on such building façade, architectural feature, or landscaping and away from adjoining properties, public or private way, and the night sky.

(j) Upward flagpole lighting is permitted for governmental flags, either publicly or privately owned, provided that the maximum lumen output is 1,300 lumens. It is encouraged that flags be taken down at sunset to avoid the need for lighting.

(k) Any luminaire must be installed in such a manner that the light emitting source is not visible from any residence not located on the same lot as the luminaire or from any public street.

(l)

Section 15-242.6 Vehicular Canopies

(a) The light level beneath vehicular canopies (e.g. for gas stations or convenience stores) shall not exceed 10 foot candles average maintained at the perimeter of the canopy and measured at ground level. Acceptable ways of achieving this objective include, but are not limited to, one or more of the following:

(1) Recessed fixtures incorporating a lens cover that is either recessed or flush with the bottom surface (ceiling) of the vehicular canopy.

(2) Surface mounted fixtures incorporating a flat glass that provides a full cut-off or fully shielded light distribution.

(3) Indirect lighting where light is beamed upward and then reflected down from the underside of the vehicular canopy. Such fixtures shall be shielded such that direct illumination is focused exclusively on the underside of the vehicular canopy.

(4) Any other method approved by the permit issuing authority that achieves an effect similar to the foregoing illustrations.

(b) During hours when the business is not open, the lighting level shall be reduced to security lighting only.

Section 15-242.7 Outdoor Display Areas

(a) All display area lighting shall utilize fully shielded luminaires that are installed in a fashion that maintains the fully shielded characteristics.

(b) Display area lighting shall be installed such that glare is not visible from residential properties.

(c) The display area shall not be illuminated in a manner that exceeds the minimal illuminance levels for the activity as recommended by the Illuminating Engineering Society of North America (IESNA Rp-33, or as updated).

(d) For purposes of this section, an "outdoor display area" is an outdoor area where nighttime sales activity regularly occurs and where accurate color perception of merchandise by customers is required. Examples include sales areas for automobiles, boats, building supplies, or plants.

(e) During hours when the business is not open, the lighting level shall be reduced to security lighting only.

Section 15-242.8 Outdoor Sports Fields and Performance Areas

(a) The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed 80 feet from finished grade unless approved by the permit issuing authority after receipt of substantial information justifying the need for additional height.

(b) All outdoor sports field and outdoor performance area lighting fixtures shall be equipped with a glare control package (louvers, shields, or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing or performance area.

(c) Outdoor sports field and performance area lighting systems shall not be operated between the hours of eleven p.m. and sunrise.

Section 15-242.9 Prohibited Uses of Light

The following are prohibited:

(1) The use of laser source light or any similar high intensity light for outdoor advertising or entertainment, when projected above the horizon;

(2) The operation of searchlights for advertising purposes;

(3) Use of mercury vapor luminaires.

Section 15-242.10 Light Measurement Techniques

a)Light measurements shall be made at finished grade (ground level), with the light-registered portion of the meter held parallel to the ground pointing up. The meter shall have cosine and color correction and have an accuracy tolerance of no greater than plus or minus five (5) percent. Measurements shall be taken with a light meter that has been calibrated within the year. Light levels are specified, calculated and measured in footcandles (FC). All FC values are maintained footcandles unless otherwise specified.

b) Compliance with an approved light plan associated with a permit can be verified in the field by confirming that the light fixtures and bulbs do not exceed those shown on the engineered plans. When there is no approved light plan then compliance can be verified by enforcing that the light source is blocked and/or directed in compliance with this Part or by the owner obtaining and providing a professional engineer's certification that verifies that the existing conditions comply with the ordinance.

Section 15-243 RESERVED

Section 4. A new Article XV, Part III is established at the beginning of Section 15-244 as follows:

PART III: MISCELLANEOUS UTILITIES

Section 5. Appendix A, Section A-6(b)(15) is rewritten to read as follows:

(15) Outdoor illumination, including the following information:

a. Plans showing the location, type, and height of luminaires including both building and ground fixtures. The plan shall include a point-by-point footcandle array in a printout format indicating the location and aiming of illuminating devices, and indicate compliance with the maximum maintained footcandles required by Section 15-242.4 of this chapter.

b. A description of the luminaires, including lamps, supports, reflectors, raised foundations, poles or other supports and shielding devices, which may be provided as electric utility catalogue illustrations, sheets and/or drawings, and product specifications from the manufacturer.

c. Photometric data, such as that furnished by the manufacturer, showing the angle of light emission; and

d. A demonstration or showing that the applicant has attempted to reduce energy consumption through the selection of energy efficient luminaires, timers, or other methods (such as fixtures that automatically change wattage output).

Section 6. All provisions in conflict with these changes are hereby repealed.

Section 7. This ordinance is effective upon adoption.

A PUBLIC HEARING ON A LAND USE ORDINANCE TEXT AMENDMENT REVISING STREET SEPARATION REQUIREMENTS

A draft ordinance amending the Land Use Ordinance to revise street separation requirements in developments that are connected to Village Mixed Use districts has been prepared. The Board of Aldermen must receive public comments before taking action on the draft ordinance.

Trish McGuire, the town's Planning Administrator, made the presentation.

The following resolution was introduced by Alderman Dan Coleman and duly seconded by Alderman Jacquelyn Gist.

A RESOLUTION ADOPTING A STATEMENT
EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR ADOPTING
AN AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE
Resolution 90/2009-10

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: AN ORDINANCE REVISING CARRBORO LAND USE ORDINANCE TO REDUCE STREET SEPARATION REQUIRMENTS IN DEVELOPMENTS THAT CONNECT TO VILLAGE MIXED USE DISTRICTS

NOW THEREFORE, the Board of Aldermen of the Town of Carrboro Resolves:

Section 1. The Board concludes that the above described amendment is consistent with enabling authority as specified in 2.42 and 2.52 of the Carrboro Vision 2020 Policies.

Section 2. The Board concludes that its adoption of the above-described amendment is reasonable and in the public interest because the Town seeks to minimize the width and intensity of new road construction and to continue to implement the Northern Study Area Plan.

Section 3. This resolution becomes effective upon adoption.

The foregoing resolution having been submitted to a vote received the following vote and was duly adopted this 26th day of January 2010:

Ayes: Dan Coleman, Sammy Slade, Lydia Lavelle, Mark Chilton, Joal Hall Broun, Jacquelyn Gist, Randee Haven-O'Donnell

Noes: None

Absent or Excused: None

MOTION WAS MADE BY DAN COLEMAN AND SECONDED RANDEE HAVEN-O'DONNELL TO ADOPT THE ORDINANCE ENTITLED, "AN ORDINANCE REVISING THE CARRBORO LAND USE ORDINANCE TO REDUCE STREET SEPARATION REQUIREMENTS IN DEVELOPMENTS THAT CONNECT TO VILLAGE MIXED USE DISTRICTS." VOTE: AFFIRMATIVE ALL

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C-2

CONTINUATION OF A PUBLIC HEARING ON A LAND USE ORDINANCE TEXT AMENDMENT REVISING OUTDOOR LIGHTING STANDARDS (ITEM A(2)

A draft ordinance modifying outdoor lighting provisions has been prepared. The Board of Aldermen must receive public comment before taking any action.

MOTION WAS MADE BY JOAL HALL BROUN AND SECONDED BY JACQUELYN GIST TO CONTINUE THIS PUBLIC HEARING TO MARCH 23, 2010. VOTE: AFFIRMATIVE ALL

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TOWN OF CARRBORO

NORTH CAROLINA

MEMORANDUM **PLANNING DEPARTMENT**

DELIVERED VIA: ☒ *HAND* ☐ *MAIL* ☐ *FAX* ☐ *EMAIL*

To: **Steve Stewart, Town Manager**
Mayor and Board of Aldermen

From: **Patricia J. McGuire, Planning Administrator**

Date: **February 19, 2010; updated March 19, 2010**

Subject: **Outdoor Lighting Standards Ordinance**

This staff memo is an updated version of one provided for the public hearing on January 26, 2010 and continued to February 23rd and March 23rd. Additional information has been added to respond to two questions from Board of Aldermen members and to outline the comments under consideration by the Northern Transition Area Advisory Committee. Otherwise, the memo includes information provided previously.

Board of Aldermen Questions

1) *Can cities regulate the lighting fixtures that Duke Energy and other electric utilities are providing*? The Town can require/prohibit particular lighting amounts and fixtures through its regulation of land use and development and in so doing, influence the fixtures provided by Duke Energy and other utilities. If a particular fixture was not available from a utility, property developers would need to acquire it directly from supplier, which would likely influence electric utilities in the type of fixtures made available. Staff does not believe the Town can directly regulate lighting fixtures provided by electric utilities.
2) *Why is the 25-foot pole configuration more energy efficient*? The 25-foot pole configuration described by Shannon Brummet is more energy efficient because of the particular lighting plan and lighting fixtures/lamp wattages that are available. Most outdoor lighting for streets, common areas, and parking lots in town is provided by local electric utilities, which include Duke Energy, Piedmont Electric, and Progress Energy. These utilities provide a range of lighting fixtures. Currently, these fixtures use either metal halide (MH) or high pressure sodium (HPS) lamps though, due to NC renewable energy and energy efficiency portfolio standards adopted in 2007 (http://www.ncuc.commerce.state.nc.us/reps/reps.htm), utilities are testing the use of other fixtures including ones with light-emitting diode (LED) "lamps." HPS lamps are used only in cobra style lighting, typically mounted at 20 feet or higher. MH lamps are used in other fixtures, often described as "decorative" or "specialty," including 15-foot tall poles with shoebox fixtures that have been installed in Carrboro in compliance with the existing 15-foot pole limit. HPS lamps have a higher lumen output per watt and longer

operating life than MH lamps. In order to achieve the desired amount of illumination and lighting uniformity, two basic options were provided to Mr. Brummett, 250-watt HPS lamps on 25-foot poles or 100-watt MH lamps on 15-foot poles. Due to larger spread associated with taller poles, three times as many 100-watt MH lamps were needed to provide the same amount of illumination as one 250-watt HPS and an excess of 50 watts for each location. Leasing, including capital and maintenance costs, as well as operational costs, is higher for MH lamps and fixtures. It should be noted that energy efficiency may not result from the use of taller light sources in every instance. This is because light intensity falls off in an inverse relationship to distance. Known as the "Inverse Square Law," the effect is that light intensity varies with the square of the distance between the source and subject or surface. This occurs because the light spreads out as it travels from the source.

Northern Transition Area Considerations

The NTAAC discussed the draft ordinance on January 25 and discussed six possible edits to the ordinance. The NTAAC continued its discussion to February 22nd, focusing on:

1) The definition of floodlight to include area lights found in rural areas.
2) Including bona fide agricultural uses as exempt from ordinance.
3) Change wording regarding minimum lighting for security.
4) Re-order section on subdivision lighting requirements.
5) Revise general standards; reconsider 25-foot height and illustrating maximum lumens per acre.
6) Evaluating 80-foot height for sports and performance areas further.

Additional considerations were noted in relation to education and outreach, applicability, standards, and correcting nonconformities. Recommendations were finalized and are included as *Attachment H 6-7.*

EXISTING AND PROPOSED ORDINANCE PROVISIONS

Article XV, Sections 15-242 and 15-243 (*Attachment C*) specify lighting requirements and excessive illumination levels in the following manner:

1) Streets, sidewalks, common areas in subdivisions must be sufficiently lighted to ensure the safety of persons and the security of property, and
2) Installation of all needed street lighting fixtures must be coordinated by a developer. The town is responsible for installation by the time streets are accepted and the developer is responsible for light installation in common areas not dedicated for public use.
3) Roads, driveways, sidewalks, parking lots, and other common areas and facilities in unsubdivided developments shall be sufficiently lighted as in item 1 above.
4) All entrances and exits in substantial buildings used for non-residential purposes and in multi-family residential buildings containing four or more dwelling units must be lighted as above.
5) Outdoor lighting (excluding lighting for signs) shall be controlled in terms of both height and intensity.
6) Lighting from a development may not produce a strong light or reflection beyond its lot lines or into the street and impair the vision of a driver of any vehicle upon such street.

7) Light poles are limited to 15 feet in height and luminaries must be shielded.
8) Light levels must not exceed .2 footcandles at lot lines except in certain lots in the B-1(c) and B-1(g) districts where the levels may reach 2.0 footcandles.

Footcandle has been the typical unit of measurement for light, with one footcandle representing the amount of light emitted from one candle at a distance of one foot away. The maximum .2-footcandles at the property line represents light equivalent to two/tenths of one candle at a distance of one foot from a candle. As a point of reference, the NC Fire Code, 2006 edition, requires exit lighting to provide a minimum of 1 foot-candle at the floor level. There are exceptions for auditoriums, theaters and concert halls where performances are conducted, allowing a decrease in the amount of lighting to .2 foot-candle provided that required illumination comes on immediately when an emergency occurs.

DEVELOPMENT OF THE DRAFT ORDINANCE

In 2004, the NTAAC provided the Board with a draft ordinance on lighting that included seven major changes from the existing regulations, including:

1. Defines terms and requirements more specifically than existing
2. Application of the ordinance to all non-residential, private and public outdoor lighting fixtures
3. Exempts certain uses and types of lighting
4. Describes information needed in lighting plans for new development
5. Specifies general and particular standards for uses and areas
6. Requires removal on nonconforming lighting and conformity within 5 and ½ years of adoption of the ordinance
7. Describes light measuring techniques.

The Board of Aldermen directed follow-up on the recommendations, including:

1) Staff is to create a draft ordinance amendment using the lighting report as a reference.

2) Reference to amortizing existing lighting fixtures should be removed; *done, although draft ordinance does require removal/modification of nonconforming floodlights three months after a notice of violation has been issued.*

3) Any proposed ordinance should apply to residential as well as non-residential areas. *Done. Though some provisions apply differently to each area, the draft ordinance is applicable to all areas in Town.*

4) That provisions relating to street lighting not be included in the Land Use Ordinance but be included in modifications to the existing Public Works "Street Lighting Policy" *Done. The ordinance does not include standards for street lights, though it does clarify the installation requirements for street lights as part of the development review process that is otherwise controlled by the LUO.*

5) That the draft ordinance be referred to the Downtown Development Commission, Environmental Advisory Board, Planning Board and Recreation and Parks Commission. *Done. In addition, staff has shared the draft ordinance with builders, designers, dark sky*

enthusiasts, and lighting and energy professionals and considered any comments in preparation for the public hearing.

Staff has compared the NTAAC's recommended ordinance (from 2004) to the one prepared for this public hearing. The comparison follows the summary of the draft ordinance (below). Lighting regulations in other communities have been reviewed as part of the drafting of this ordinance, as has the IDSA model ordinance and other materials. A comparison of the draft ordinance to the most recent IDSA model ordinance is also provided below.

DRAFT ORDINANCE

The draft ordinance includes two sections, one of which repeals existing ordinance language and establishes the provisions for a new article, entitled Outdoor Lighting Standards. The second section amends the information required with an application in relation to outdoor lighting. A summary of the ordinance is provided here. Italic text indicates where substantive edits have been made to the version of the ordinance presented at the opening of the public hearing in January, 2010.

1) Rewrites Sections 15-242 and reserves 15-243 for future use.
2) Establishes three Parts to Article XV, entitled Water and Wastewater, Outdoor Lighting, and Miscellaneous Utilities
3) Section 15-242 -states the purpose and intent of lighting provisions.
4) Section 15-242.1 - defines 14 terms related to the lighting
5) Section 15-242.2 -establishes applicability of the ordinance to new development and to additions or renovations of existing development. Nonconforming floodlights are to be brought into compliance or removed within three months after the date of notification of the violation. States uses/activities to which the standards do not apply.
6) Section 15-242.3 – states minimum security lighting standards for subdivisions with public streets, subdivisions and unified developments with private streets, and non-residential buildings and multi-family dwellings.
7) Section 15-242.4 - delineates the role of the Town and developers in the installation of street lights associated with new public or private streets.
8) Section 15-242.5 -establishes general standards for lighting fixtures, levels, trespass, and pole placement. *Modification makes the maximum lumen levels recommendations rather than requirements. Staff feels more time is needed to evaluate this provision. As a recommendation, staff will be able to monitor how these proposed levels relate to lighting plans that are submitted. The second modification in this section creates a presumptive lighting fixture height standard, allowing the permit-issuing authority some flexibility in requiring lower or allowing higher lighting fixture heights. This standard has been simplified to refer to the height of light poles (as is done in the current LUO provision) and to establish the presumption that 15 feet is the maximum regardless of location on lots used for residential or non-residential purposes.*
9) Section 15-242.6 -specifies light limits, fixture types, and lighting schedules associated with vehicular canopies typically found at gas stations or convenience stores. *Modification deletes one lighting fixture option that would have allowed some spillage of light from beneath the vehicular canopies.*

10) Section 15-242.7 – establishes lighting parameters for outdoor display areas; refers to IESNA publication on recommended illuminance levels.
11) Section 15-242.8 – specifies sports and performance area lighting.
12) Section 15-242.9 – prohibits the use of laser source lights, searchlights for advertising purpose, and mercury vapor luminaries.
13) Section 15-242.10 – describes light measurement techniques. *Modification clarifies the methods that would be used for determining compliance with approved lighting plans.*
14) Appendix A-rewrites the description of the information that is needed to document how a land use permit application complies with the lighting requirement.

COMPARISON OF DRAFT ORDINANCE TO THE NTAAC'S ORIGINAL RECOMMENDATIONS

	NTAAC recommendation	**Draft ordinance**
1	Add new provisions as Article XVII entitled "Outdoor Lighting Standards."	New provisions included within new Part II of Utilities article, "Outdoor Lighting"
2	Specify purpose and intent	See revised Section 15-242.
3	Add definitions	See new Section 15-242.1.
4	Specify applicability	See new Section 15-242.2.
5	Specify exemptions	See new Section 15-242.2; requirements will apply to all new development and any addition or replacement of existing light fixtures. Existing lighting that does not meet requirements are not considered nonconforming and may remain except for floodlights which are installed in such a manner that their light is directed other than 45 degrees above straight down. Such lights must be brought into compliance or removed within three months of a notice of violation. See attached lighting examples.
6	Specify submittal requirements	See revisions to Appendix A.
7	Specify general standards for all areas	See new Sections 15-242.3, 15-242.4, 15-242.5. (Note: draft ordinance maintains .2 fc at the property line in all locations other than certain portions of the B-1(c) and B-1(g), rather than the .5 fc recommended by NTAAC).
8	Specify lighting in parking lots and outdoor areas	See new Section 15-242.5.
9	Specify lighting for vehicular canopies	See new Section 15-242.6.
10	Specify lighting for outdoor sports field/outdoor performance	See new Section 15-242.8.
11	Specify lighting of outdoor display areas	See new Section 15-242.7.
12	Specify lighting of buildings and landscaping	See new Section 15-242.5.
13	Specify prohibitions	See new Section 15-242.9.

	NTAAC recommendation	Draft ordinance
14	Specify nonconformities.	See new Section 15-242.2
15	Specify light measurement techniques	See new Section 15-242.10
16	Specify severability	N/A

CONSIDERATION OF INTERNATIONAL DARK SKY ASSOCIATION MODEL LIGHTING ORDINANCE (MLO) – 60 % PUBLIC REVIEW NOT FOR ADOPTION OR USE

IDSA SECTION OF MLO	HIGHLIGHTS	COMMENTS IN RELATION TO CARRBORO DRAFT
Preamble	States that the purpose of the ordinance is to conserve energy, minimize adverse, offsite lighting impacts, curtail light pollution and preserve the nighttime environment, preserve the dark night sky for astronomical observations and enjoyment, and help protect the natural environment from the adverse effects of night lighting from electric sources.	Carrboro draft describes the purpose and intent of the outdoor lighting provisions to ensure safety and security, advertising and attention to commercial areas. Excessive or inappropriately directed light is described as possibly creating glare, interfering with the observation of the nighttime sky, wasting valuable energy or otherwise interfering with the enjoyment of public or private property.
Definitions	61 definitions are included	14 definitions are included, six of which align with definitions in the MLO
General requirements for all outdoor lighting	Specifies applicability, exemptions; defines 5 lighting zones from "no ambient lighting" to "high ambient lighting" based on expected uses and visual needs of users in various areas in a jurisdiction; establishing automatic control and curfew provisions	See Section 15-242.2, 15, 242.3, 15-242.4 and 15-242.5. Staff considered the lighting zone approach, but found it to be more complicated than was needed. Curfew provisions are specified or recommended for floodlights in Section 15-242.5(e), canopy lighting in 15-2426(b), outdoor display areas in 15-242.7(e), and outdoor sports areas in 15-242.(c).
Requirements for non-residential outdoor lighting	Specifies Prescriptive (total site lumens limits and limits to off-site impacts (BUG)) or Performance methods for determining compliance.	See 15-242.5 (c) and (d); see also 15-242.6 (vehicular canopies), 15-242.7 (outdoor display areas), and 15-242.8 (outdoor sports and performance areas). Maximum lumen levels included in Section 15-242.5(d) derived from MLO and other sources. Due to complexity, staff suggests adopting as a recommended standard to allow time for evaluation.
Requirements for residential outdoor lighting	Total wattage and lumens specified.	See 15-242.5 generally, with specific note of allowances for residential uses in (c) and (d). Maximum wattage/lumens suggested as recommended standard at this time.

IDSA SECTION OF MLO	HIGHLIGHTS	COMMENTS IN RELATION TO CARRBORO DRAFT
Lighting by special use permit only	Alternative permit process proposed for high-intensity and special purpose lighting, complex and nonconforming uses.	Permit requirements by land use proposed. No changes to this structure are included/ recommended in the draft ordinance.
Existing lighting	Pre-existing lighting to comply with ordinance as follows: Amortization date to be specified; New use/change in use: all fixtures brought into compliance before new use initiated. Additions: all lighting to comply if addition of 50 percent or more of dwelling units, square footage, lighting fixtures; if less than 50 percent addition, only new are required to comply. After abandonment of use for six months or more, all outdoor lighting must comply.	Addition of new luminaires or replacement of existing must comply with new requirements. Any floodlights, per Section 15-242.5(e) must be brought into compliance or removed within three months after the date of notification of violation. Section 15-242.5 (f) proposes a mechanism that would allow some deviation in the height of light fixtures based on existing uses.
Enforcement and penalties	This section is reserved.	Refer to Article VII http://www.townofcarrboro.org/PZI/PDFs/ LUO/ART-VII.pdf
Tables	Lumen levels and BUG ratings.	Recommended lumen levels derived from MLO, Table D
Appendix A "Performance Method"	Describes computer software analysis of skyglow/total illumination.	N/A

SUMMARY OF ORANGE COUNTY AND ADVISORY BOARD COMMENTS AND RECOMMENDATIONS AND RESPONSE IN DRAFT ORDINANCE, IF APPLICABLE

Reviewer	Comment/Recommendation	Draft Ordinance
Orange County	Suggest addition of definition of "substantial building"	No change
" "	Change "to see" to "to ensure	Change included in draft
" "	Typo	Corrected
Environmental Advisory Board	Remove "streets, sidewalks" and "roads, driveways, sidewalks" from 15-242.3 (a) and (b)	No change
Planning Board	Presumptive standard for maximum height of light fixtures is 15 feet.	Height requirement changed to 15 feet and to apply to poles
" "	Appendix A change to reference life cycle costs and lease/purchase of LED area	No change

Reviewer	Comment/Recommendation	Draft Ordinance
	lighting.	
Northern Transition Area Advisory Committee	Remove words "substantially equivalent" from lighting requirements for subdivisions with private streets	No change
" "	Board of Aldermen review street lighting policy	Policy included in packet, per request from Aldermen Broun
" "	Review allowing lighting heights up to 25 feet and ambiguity.	Height requirement changed to 15 feet and to apply to poles, rather than fixtures.

STAFF RECOMMENDATION

The ordinance included in the public hearing agenda packet includes several edits, including additions and deletions from the version provided at the time the public hearing on this matter was set in November. These changes are summarized above (italic text) in the section describing the draft ordinance. Staff recommends adopting the ordinance with these changes.

Excerpt from Carrboro Land Use Ordinance, November 2009

Section 15-242 Lighting Requirements.

(a) Subject to subsection (b), all streets, sidewalks, and other common areas or facilities in subdivisions created after the effective date of this chapter shall be sufficiently illuminated to ensure the security of property and the safety of persons using such streets, sidewalks, and other common areas or facilities.

(b) To comply with subsection (a), the developer shall coordinate with the electric utility company to see that all facilities necessary for eventual installation of street lights are put in place. However, the town shall be responsible for requesting the electric utility company actually to install such street lights at the time the town accepts the streets for maintenance. The developer shall be entirely responsible for the placement of necessary lighting in common areas not dedicated to public use.

(c) All roads, driveways, sidewalks, parking lots, and other common areas and facilities in unsubdivided developments shall be sufficiently illuminated to ensure the security of property and the safety of persons using such roads, driveways, sidewalks, parking lots, and other common areas and facilities.

(d) All entrances and exits in substantial buildings used for non-residential purposes and in multi-family residential dwellings containing more than four dwelling units shall be adequately lighted to ensure the safety of persons and the security of the building.

Section 15-243 Excessive Illumination (AMENDED 05/25/99; 2/5/08)

(a) Outdoor lighting (not including sign lighting) shall be controlled in both height and intensity as provided in this section.

(b) No development shall be permitted to produce a strong light or reflection of that light beyond its lot lines onto neighboring properties, or onto any street so as to impair the vision of the driver of any vehicle upon such street.

(c) Light fixtures may not exceed fifteen (15) feet in height, and luminaries shall be shielded or configured to cast the light downward and to prevent light from shining beyond the lot lines into neighboring properties or public ways. The permit issuing authority may by condition impose additional requirements as necessary to prevent adverse impacts to adjoining properties and residents. Notwithstanding the foregoing, this section shall not apply to the lighting of recreational facilities provided that, to the maximum extent practicable, potential light pollution can be otherwise minimized through the use of shielding and limits on hours of use.

(d) Except as otherwise provided in this subsection, under no circumstances may the light level at a lot line exceed .2 foot candles. A limitation of 2.0 footcandles shall generally apply to lot lines in the B-1(c) and B-1(g) zoning districts. However, a limitation of .2

footcandles shall apply to lot lines of properties zoned B-1(c) or B-1(g) under any of the following circumstances:

(1) Where such lot lines separate properties zoned B-1(c) or B-1(g) from properties zoned residential;

(2) If and to the extent that properties zoned residential lie directly across a street from the lot lines of properties zoned B-1(c) or B-1(g);

(3) Where such lot lines separate properties zoned B-1(c) or B-1(g) from properties that are not zoned residential but that are used for residential purposes and were so used on the effective date of this subsection;

If and to the extent that properties that are not zoned residential but are used for residential purposes and were so used on the effective date of this subsection lie directly across a street from the lot lines of properties zoned B-1(c) or B-1(g).

CARRBORO DEVELOPMENT GUIDE
APPENDIX A

TOWN OF CARRBORO

To the Board of Aldermen, the Planning Board, and the Appearance Commission, as appropriate, of the Town of Carrboro:

I (we), the undersigned do hereby respectfully make application and petition the Board of Aldermen to amend the Land Use Ordinance. In support of this application, the following facts are shown:

1) The Land Use Ordinance, at present, would allow (description/quote, page and number of section in question):

Attached.

2) The proposed amendment to the Land Use Ordinance would allow (describe briefly intended change):

3) State the reasons for the proposed amendment:

SIGNATURE: Shannon F. Brummett (applicant) Shannon F. Brummett (print)

ADDRESS: 3608 University Dr. #201, Durham, NC 27707

TELEPHONE NUMBER: (919) 401 4577

1) The Land Use Ordinance, at present, would allow (description/quote, page and Number of section in question):

Article XV: Pg 7 (Section 15-243 Excessive Illumination) Section (C) in part: Light Fixtures may not exceed 15 Feet in height."

2) The proposed amendment to the Land Use Ordinance would allow (describe briefly intended change):

When an existing nonconformity to the section is present by a majority of the fixtures, the landowner at their option may increase the lighting height not greater than the current residential maximum limits. The lighting must comply with the full cutoff fixture, and engineered to limit the horizontal and aerial exposure to current standards.

3) State the reasons for the proposed amendment:

The current lighting offered in the full cutoff fixture is less efficient at a height of 15 feet than the similar fixture at a height of 25 feet. This limited illumination will require 3 times the fixtures and increased costs for installation and operation.

STREET LIGHTING POLICY

The Town of Carrboro is responsible for lighting all dedicated streets within its municipal limits. This policy was developed to address the concerns of uniformity, standardization, safety, and economizing of street lighting. The goals and objectives of this policy are: provide for safe use of Town streets by motorists, bicyclists, and pedestrians; discourage crime; assist individuals in locating destinations; and serve resident and business needs. Adequate, but not excessive, street lighting is necessary to ensure the safety of motorists, bicyclists, pedestrians, and businesses.

The Illumination Engineer Society (IES) sets street lighting standards for different roadway categories in order to give Departments of Transportation and municipalities guidelines. These standards, which vary according to street classification, provide foot-candle and uniformity ratios that municipalities should meet in order to maintain a fairly consistent level of illumination. Meeting these standards must be weighed against the feasibility and desirability of the suggested levels of illumination. In residential areas uniformity ratios are more difficult to meet because only intersections are usually lit.

RESIDENTIAL

In residential areas, the Town of Carrboro shall place lights every 400 to 500 feet and at every intersection and cul-de-sac. When a street exceeds 500 feet in length, the lights should be placed in the middle of the block, or so there is a light provided at least every 500 feet.

The Town shall use High Pressure Sodium (HPS) 9,500 lumen (100 watts), 16,000 lumen (150 watts), or 27,500 lumen (250 watts) luminaries, mounted on 25' - 30' salt-treated wood or fiberglass poles. The standard light fixture shall be the Cobra-head or cut off fixture design to minimize upward light and deemed "night sky friendly."

Trees, winding streets, high crime, traffic, school areas, and existing pole spacing influence the effectiveness and needs of street lighting. Lights shall be placed at shorter intervals and at higher lumen levels when traffic or pedestrian safety, or other extenuating circumstances, indicate a need for more dense lighting. The Director of Public Works shall be responsible for determining the necessary light spacing and luminary requirements under any unusual conditions.

COMMERCIAL

In commercial areas and the central business district, the Town shall place lights at 150' intervals. The Town shall use HPS - 27,500 lumen luminaries on 25 - 30' wooden, fiberglass, aluminum, or metal poles with 6' arms. The standard light fixture shall be the Cobra-head or cut off fixture design to minimize upward light and deemed "night sky friendly."

INTERSECTIONS

The Town shall light all intersections. The light should face the more heavily traveled street. When an unusual number of trees are present at an intersection, or when trees exceed 36 inches in width, two lights are to be used, placed diagonally on the corners.

ALTERNATIVE LIGHTING OPTIONS

Alternative lighting fixtures and poles are not acceptable. These lights do not meet the policy guidelines of producing uniform, standard and adequate light economically.

The only exception to this policy will be if a developer or a Homeowners' Association requests, in writing, to the Director of Public Works that an exception of alternative lighting for the entryway of a development be allowed. If the Director of Public Works grants the exception, then the developer or Homeowners' Association requesting the lighting must pay all monthly rental and installation costs for the alternative lights to the appropriate utility company.

ADDITIONS, DELETIONS, & RELOCATIONS

Request for lighting changes, including additions, deletions, relocations, spacing, type or size, shall be examined by and acted upon at the discretion of the Director of Public Works. The Town may request the appropriate utility company to erect additional lights or relocate existing lights when deemed necessary.

GENERAL

Street lighting loses effectiveness in the spring, summer, and fall because of the full growth on trees. An active tree maintenance policy must be followed in conjunction with this street lighting policy to ensure maximum lighting effectiveness. The Director of Public Works or his designee shall work closely with any tree trimming or removal necessary to improve the lighting efficiency for a particular light.

AMENDMENTS

This policy may be reviewed and amended at anytime, with the support of the Director of Public Works, Town Manager, and Board of Aldermen.

Revised/updated: August, 2007, clarified the use of cut off fixtures for Public lighting applications to minimize upward light.

ORANGE COUNTY PLANNING & INSPECTIONS DEPARTMENT
Craig N. Benedict, AICP, Director

Administration
(919) 245-2575
(919) 644-3002 (FAX)
www.co.orange.nc.us

306F Revere Road
P O Box 8181
Hillsborough,
North Carolina, 27278

TRANSMITTAL DELIVERED VIA EMAIL

January 8, 2010

Patricia J. McGuire, AICP
Planning Administrator
Town of Carrboro
301 W. Main St.
Carrboro, NC 27510

SUBJECT: Joint Planning Review of Proposed Ordinance Amendments

Dear Trish:

Thank you for the opportunity to review the following Land Use Ordinance amendments received by us on December 31, 2009 and proposed for town public hearing on January 26, 2010:

- Modifying Street Separation Requirement
- Revisions to Lighting Provisions
- Modifications to Buffer and other Provisions for Compliance with Jordan Lake Rules

We find no inconsistency with the adopted *Joint Planning Area Land Use Plan* on these proposed amendments. We'd like to offer the following general comments:

- In the proposed Lighting section of the Ordinance – Section 15-242.3(c): the term "substantial buildings" is used but we have been unable to find a definition of the term in the Town's LUO. We suggest that a definition be added for "substantial building" in order to be clear as to what types of buildings this provision applies.
- In the proposed Lighting section of the Ordinance – Section 15-242.4(a) and (b): We believe the words "to see" are used in these sections to mean "to ensure." If so, we suggest that "to ensure" or a similar synonym be used as we find the term "to see" as used in this context to be vague.

- In the proposed Lighting section of the Ordinance – Section 15-242.4(a): in the last sentence, there appears to be a typo; the word "or" should be "for."

If you have any questions or need additional information, please let me know.

Sincerely,

Perdita Holtz

Perdita Holtz, AICP
Planning Systems Coordinator

TOWN OF CARRBORO

ENVIRONMENTAL ADVISORY BOARD

301 West Main Street, Carrboro, North Carolina 27510

RECOMMENDATION

THURSDAY, JANUARY 21, 2010

Land Use Ordinance Text Amendments to outdoor lighting provisions

Motion was made by Nina Butler and seconded by Andreas Hay that the EAB recommends that the Board of Aldermen adopt the draft ordinance with the following revision, to address light pollution and energy reduction goals:

Section 15-242.3 Minimum Lighting Requirements for Security

(a) All ~~streets, sidewalks, and~~ other common areas or facilities in subdivisions shall be sufficiently illuminated to ensure the security of property and the safety of persons using such streets, sidewalks, and other common areas or facilities.

(b) All ~~roads, driveways, sidewalks~~, parking lots, and other common areas or facilities in unsubdivided developments shall be sufficiently illuminated to ensure the security of property and the safety of persons using such roads, driveways, sidewalks, and other common areas or facilities.

VOTE: **AYES**: Butler, Hay, Weller, Gisler
ABSENT/EXCUSED: Arnsberger, Mullen, Stidham
NOES:
ABSTENTIONS:

Associated Findings

By a unanimous show of hands, the Environmental Advisory Board membership also indicated that no members have any financial interests that would pose a conflict of interest to the adoption of this amendment.

Furthermore, the EAB of the Town of Carrboro finds that the proposed text amendment, as modified, is consistent with Carrboro Vision 2020 policies specified in 2.2 5.51, policies that seek to preserve the natural environment and minimize energy use.

Andrew Hay 1-21-10
(Chair) (Date)

TOWN OF CARRBORO

PLANNING BOARD

301 West Main Street, Carrboro, North Carolina 27510

RECOMMENDATION

THURSDAY, JANUARY 21, 2010

Land Use Ordinance Text Amendments to outdoor lighting provisions

Motion was made by Damon Seils and seconded by Rose Warner that the Planning Board recommends that the Board of Aldermen adopt the draft ordinance.

VOTE: **AYES:** (6) Matthew Barton, Sharon Cook, Debra Fritz, Damon Seils, David Shoup, and Rose Warner; **ABSENT/EXCUSED:** (4) Richard Bell, David Clinton, Heidi Paulsen, and Susan Poulton **NOES:** (0); **ABSTENTIONS:** (1) CARNAHAN

Associated Findings

By a unanimous show of hands, the Planning Board membership also indicated that no members have any financial interests that would pose a conflict of interest to the adoption of this amendment.

Furthermore, the Planning Board of the Town of Carrboro finds that the proposed text amendment The Board concludes that the above described amendment is consistent with Carrboro Vision 2020 policies specified in 2.2 and 5.51 that seek to preserve the natural environment and minimize energy use.

VOTE: **AYES:** (6) Matthew Barton, Sharon Cook, Debra Fritz, Damon Seils, David Shoup, and Rose Warner; **ABSENT/EXCUSED:** (4) Richard Bell, David Clinton, Heidi Paulsen, and Susan Poulton **NOES:** (0); **ABSTENTIONS:** (1) James Carnahan

Matthew Barton 1/22/10

(Chair) (Date)

TOWN OF CARRBORO

PLANNING BOARD

301 West Main Street, Carrboro, North Carolina 27510

RECOMMENDATION

THURSDAY, FEBRUARY 18, 2010

Land Use Ordinance Text Amendments relating to outdoor lighting provisions

Motion was made by Matthew Barton and seconded by David Clinton that after additional discussion of the draft ordinance related to outdoor lighting, the Planning Board recommends to the Board of Aldermen the following modifications to the draft ordinance:

1) The first sentence of Subsection 15-242.5(f) is rewritten to read "The presumptive standard for the maximum height of light fixtures is fifteen (15) feet."
2) In Appendix A, Section A-6(b)(15), subdivision d. is rewritten to read "A demonstration or showing of the lifecycle costs of all proposed lighting, including an evaluation of the lease and/or purchase of LED area lighting as one strategy to reduce energy consumption, the selection of other energy efficient luminaires, timers, or other methods (such as fixtures that automatically change wattage output)."

VOTE: **AYES**: (5) Barton, Clinton, Fritz, Poulton, and Williams; **ABSENT/EXCUSED:** (5) Oxley, Seils, Shoup, Wagner, and Warner
NOES: (0); **ABSTENTIONS:** (0)

Susan Poulton 2/19/10

Susan Poulton, 1st Vice Chair **(Date)**

NORTHERN TRANSITION AREA ADVISORY COMMITTEE

Meetings: Monday, January 25, 2010 and February 22, 2010
Carrboro Town Hall, Room 100

RECOMMENDATIONS
Proposed Lighting Ordinance Amendment

MOTION OF THE NORTHERN TRANSITION AREA ADVISORY COMMITTEE REGARDING THE PROPOSED LIGHTING ORDINANCE AMENDMENT; THAT THE BOARD OF ALDERMEN CONSIDERS THE FOLLOWING CHANGES AND SUGGESTIONS:

**Note: Staff responses follow NTAAC recommendations in italics.*

ORDINANCE REVISIONS

1. 15-242.1 Definitions:
    a. The definition for "flood light" does not appear to be broad enough to include the commonly installed Duke Energy, "area" lights which are commonly installed in rural areas (Becker).

Barn lights will be regulated under General Standards.

2. 15-242.2 Applicability
    a. (d): Add "Bona fide agricultural uses" in the list of exemptions (Bryan).

Staff would like to discuss this proposal with NTAAC.

3. 15-242.3 Minimum Lighting Requirements for Security
    a. (a & b): Change "sufficiently illuminated" to "*properly* illuminated". Add to a phrase at the end that ties these two provisions into the rest of the ordinance such as "subject to all applicable lighting provisions of this section".

Use of the word 'properly' assumes that the ordinance defines what is 'proper', it does not. It primarily describes the limits to illumination and other associated information.

4. 15-242.4 Subdivisions:
    a. Bryan felt this section to be somewhat out of place in the sequence of the provisions.

This section is appropriately located.

5. 15-242.5 General Standards:
    a. (a-2 &4) Remove the word "directly".

That places some limitation on what "across the street" means.

    b. (e) The additional pole height requested (25') should be given additional thought.

The NTAAC would like to discuss further.

    c. (l) The "70,000 lumens per acre" and "6500 lumens per acre" numbers (for non-residential and residential maximum lighting output) are abstract and the committee needs to know what this looks like (Bryan).

Staff notes that these are included as recommended standards.

6. 15-242.8 Outdoor Sports Fields and Performance Areas:
    a. (a): The 80' poles is cause for concern. More information is needed in this area particularly since such lighting may be expected at the new Twin Creeks Park.

This is a standard for outdoor sports fields and other outdoor performance areas.

OTHER CONSIDERATIONS

1. The Board should look for ways to reduce existing violations to this ordinance. One suggestion is to require Duke Power to retrofit any of their leased "area lights" in the area with fully shielded fixtures.

The ordinance uses normal replacement as the method by which fixtures are made compliant. This information will be made public.

2. The UNC facilities division may be a good resource for standards pertaining to outdoor sports field and performance area lighting.

The Dark Sky standards are being used; height is necessary to minimize shadows.

3. The Town should maintain light measurement equipment and an inventory of the existing lighting situation around town should take place.

The Town will rely on the information presented in lighting plans associated with permit applications and/or certifications after construction/installation of lighting plans by lighting engineers.

4. The lighting ordinances should apply to new building construction and builders should be informed of this.

Town staff will develop a handout for builders.

5. The Town should look into solar and LED lighting options and consider the economics of moving away from incandescent fixtures. There are precedents of other communities making such changes.

The new ordinance requires applicants to state how their design conserves energy, but does not specify particular lamp types. LED lamps in otherwise compliant fixtures would be allowed.

6. Some provisions should be considered that limit the use of wall sconce type fixtures as are present at the Morris Grove School; these fixtures while they conform to the existing lighting ordinance, are not shielded and produce offsite glare.

Such fixtures will now be required to be shielded.

7. Some consideration of public education or outreach should be considered in lieu of amortization.

The ordinance does not amortize lighting fixtures, but staff agrees that education and outreach will be helpful.

8. That the ordinance applies to Town & County facilities, buildings, parking areas, developments, etc;

It does, except for those activities that are expressly exempted.

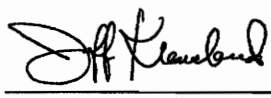
9. That lighting in parking lots in general is specifically covered in a specific section or referenced in the main regulations section.

The standards apply throughout; a specific section on parking areas does not seem necessary.

AMENDMENT

The following motions were approved by the committee on their February 22, 2010 meeting:

1. That the words 'substantially equivalent' be removed from Section 15-242.4(c) on the basis that flexibility in street lighting, especially for private situations needs to be allowed.
2. That the Board of Aldermen review the Town's street lighting policy with respect to the purpose and intent of the proposed LUO lighting standards.
3. That 15-242.5(f) which allows for lighting to heights to go up to 25' be reviewed. The NTAAC finds the current writing ambiguous as it does not clearly discourage lights on 25' poles. Further, it finds that this policy seems to be an accommodation to a service provider (Duke Energy) rather than a sound policy.



Jeff Kleaveland for NTAAC chair, Jay Bryan

NORTHERN TRANSITION AREA ADVISORY COMMITTEE

Meeting: Monday, March 15, 2010
Carrboro Town Hall, Room 100

RECOMMENDATIONS
Proposed Lighting Ordinance Amendment

MOTION OF THE NORTHERN TRANSITION AREA ADVISORY COMMITTEE REGARDING THE PROPOSED LIGHTING ORDINANCE AMENDMENT (DECKER); THAT THE BOARD OF ALDERMEN CONSIDERS THE FOLLOWING RECOMMENDATIONS (SECOND, MOORE) (AYES, UNANIMOUS):

The NTAAC has reviewed the proposed lighting ordinance and makes the following recommendations:

1. Section 15-242.2(b)) should be changed to read as follows:

   "Notwithstanding the provisions of subsection (a) of this section, luminaries installed prior to the effective date of this part that violate the provisions of this ordinance shall be non-conforming."

2. Wall pack lighting such as that which is located on the walls of the Morris Grove School should not be allowed under the ordinance

3. Sections 15-242.3 nullify the intent and protections against light pollution of the ordinance and should be removed.

4. Sections 15-242.4 (a) and (b) seem out of place because it is not about protections for light pollution. They should be relocated to the town's "street lighting policy".

5. In Section 15-242.4 c, the words, "...to the extent substantially equivalent to that provided for town streets under the town's street lighting policy" should be removed , on the basis that flexibility in street light, especially for private road situations, needs to be allowed.

6. The word "directly" should be removed from Section 15-242.5 (a)(2) and (4).

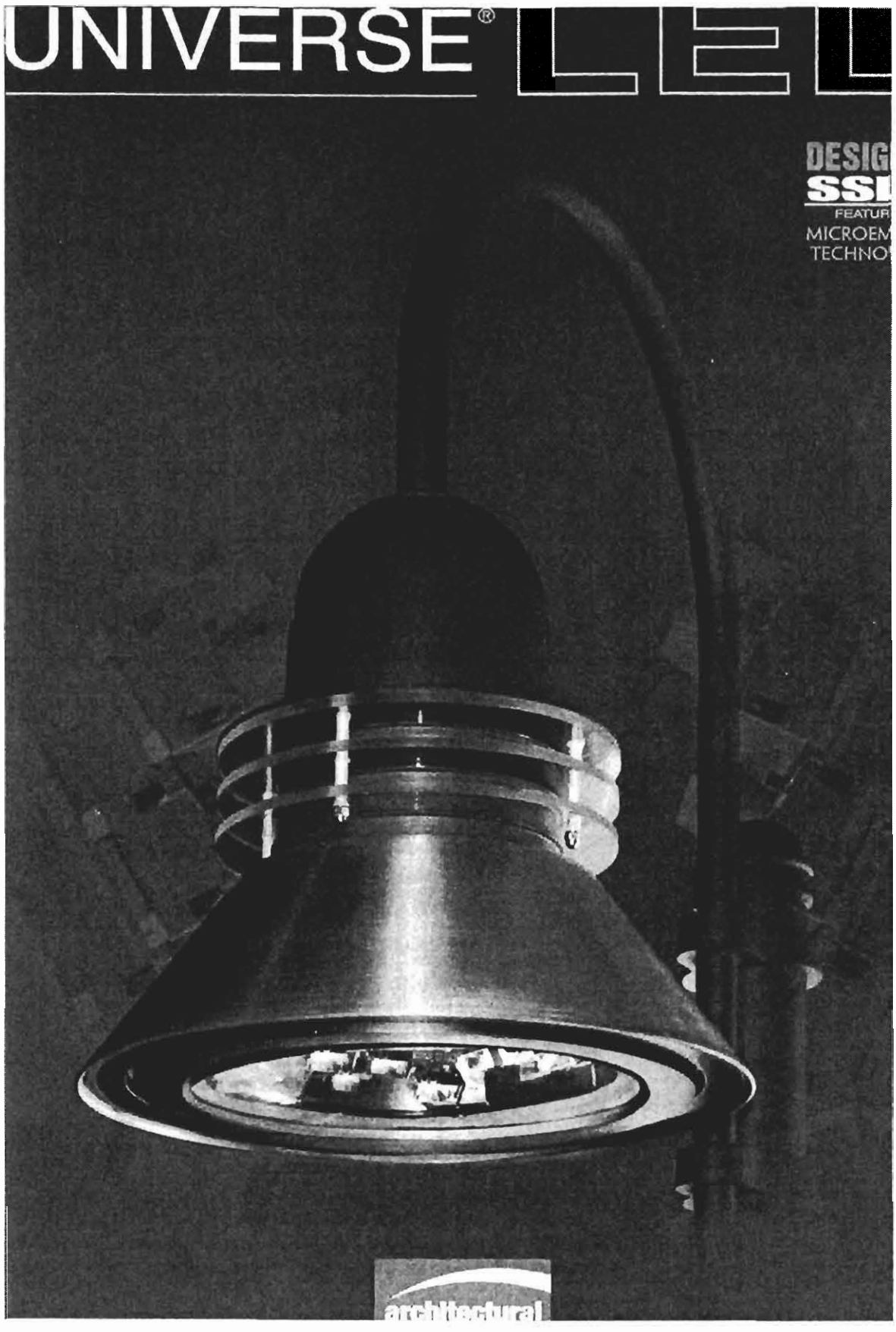
7. Under 15-242.5(d), luminaires should not exceed fifteen (15) feet in height in commercial as well as non-commercial areas.

8. Under 15-242.6(a), the NTAAC questions why the light level beneath vehicular canopies should exceed the general standards for foot candles.

9. In 15-242.8, height for outdoor sports field lighting fixtures should not exceed 60 feet from the finished grade. The following additional language should be added: "Notwithstanding the exemptions for lumens per acre and height limits in this lighting ordinance, all other general standards as recited herein shall apply to lighting for outdoor sports fields and performance areas."

10. The NTAAC expresses its concern that policy affecting lighting in the entire town, ETJ and the Northern Transition Area is being set due to the request of a property management company representative and governed in part by the limited lighting options of Duke Power.

Jeff Kleaveland for NTAAC chair, Jay Bryan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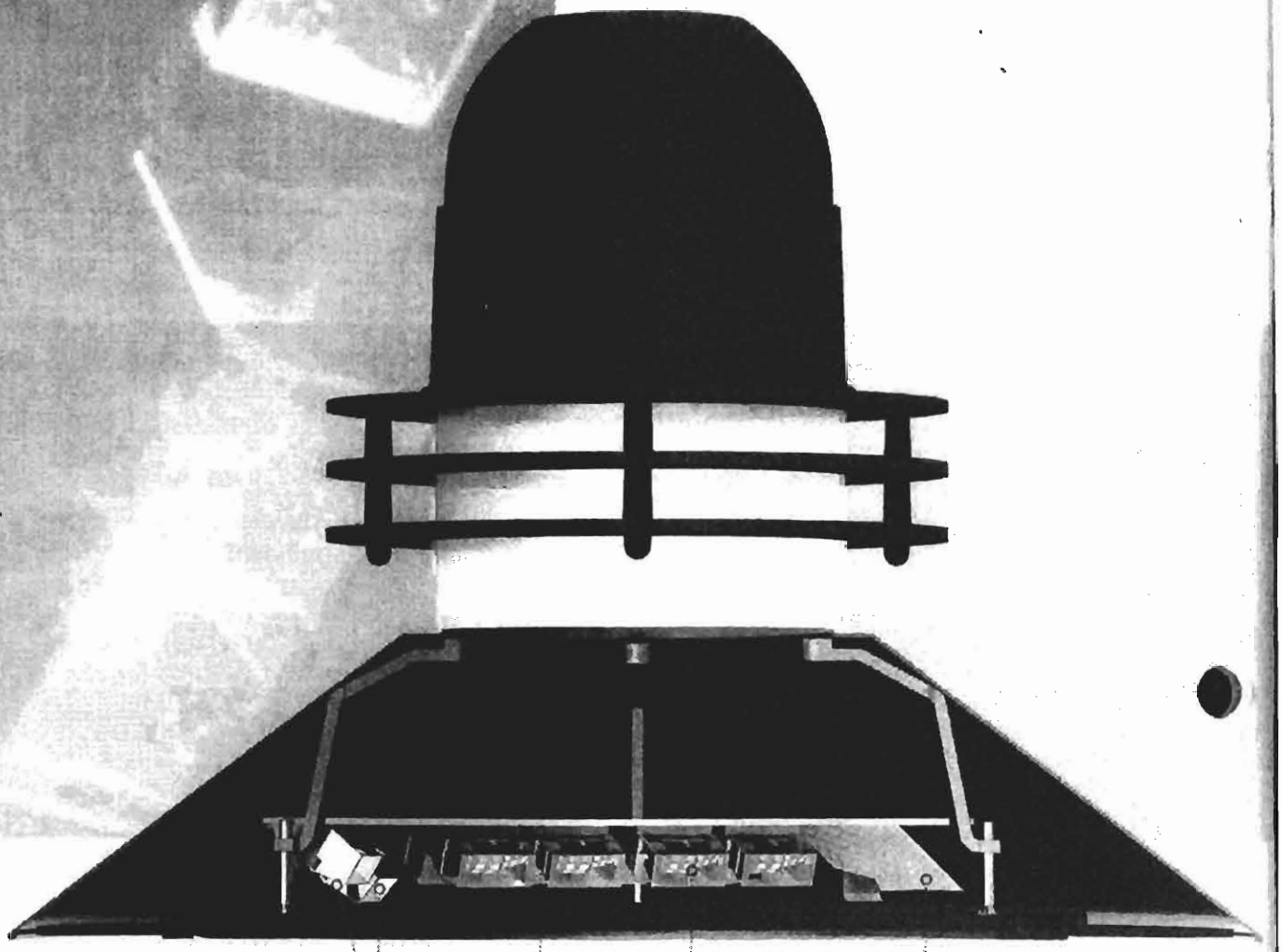
Universe® LED



Canted MicroEmitter design precisely aims each diode, at 70°, 60°, or 50° angles for maximum reach and uniform illumination

Aluminum heat dissipating carrier plate for longer LED life

Deeply regressed sources maximize efficiency while reducing glare

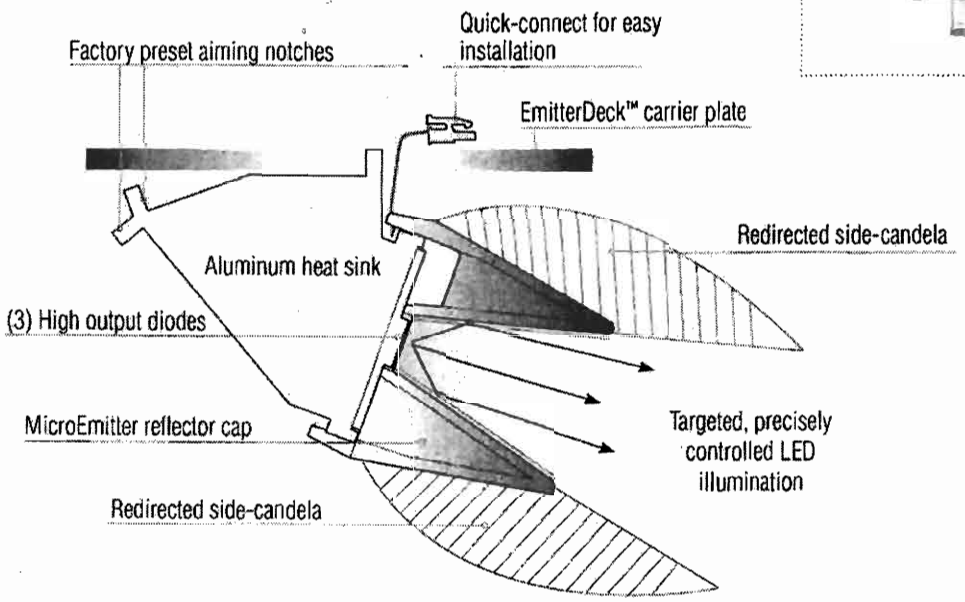
Glare guard perimeter and center reflectors redirect stray light and increase visual comfort at normal viewing angles

I-5

Revolutionary Technology for Superior LED Performance

AAL's upgradeable EmitterDeck™ design consists of an array of twenty replaceable MicroEmitter modules that tightly and precisely control powerful LED output. A secondary perimeter reflector contained within the housing redirects any stray light. The result is powerful, comfortable, uniform illumination.

Replaceable EmitterDeck assembly



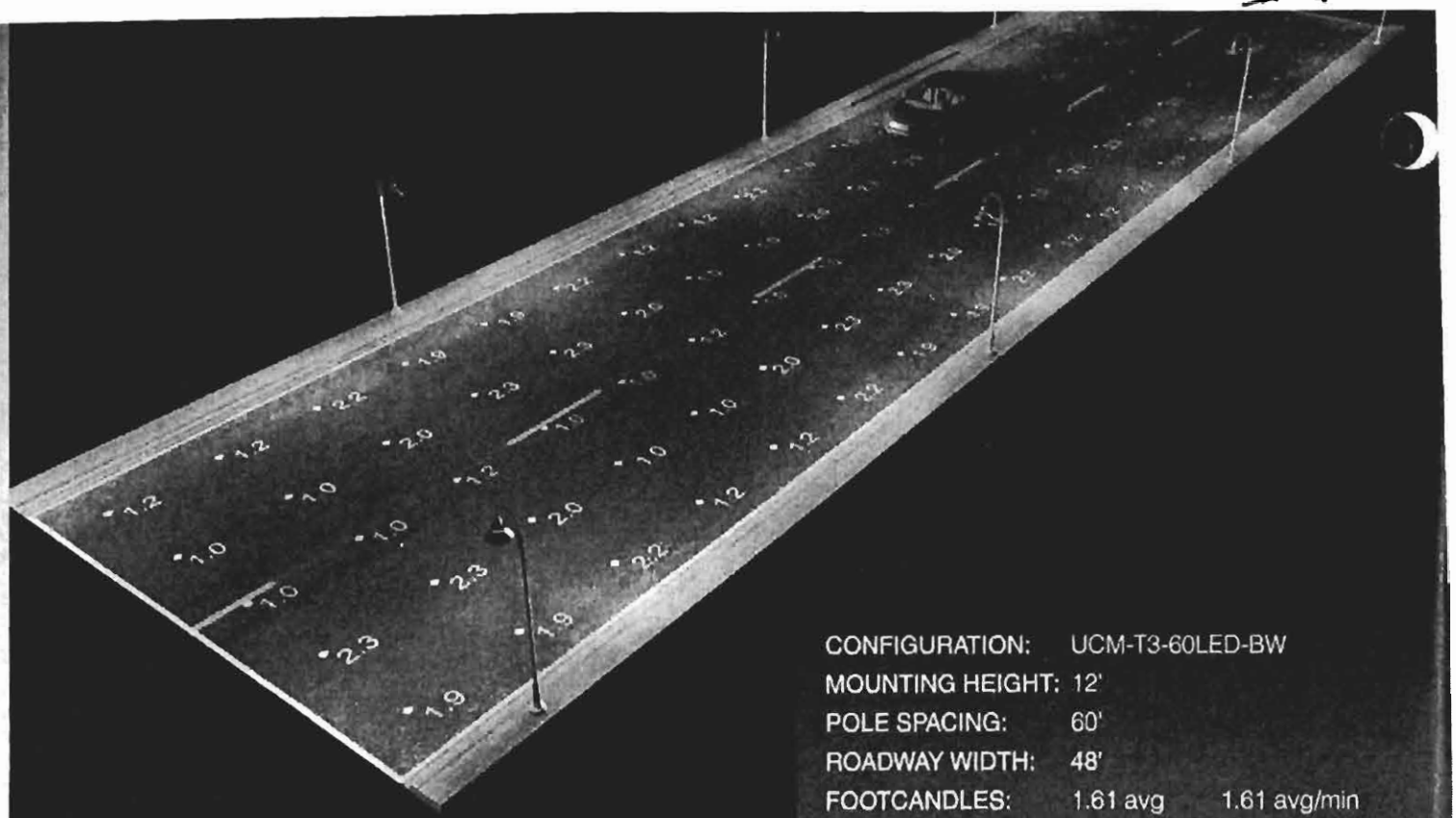
PATENTS PENDING

Illustration of a single MicroEmitter at 70° angle

Advanced Thermal Management

Each MicroEmitter incorporates a solid aluminum heat sink, which is then fastened to the EmitterDeck, a thick aluminum carrier plate designed to maximize cooling surface area. The module is then fixed to Universe's die-cast aluminum housing to effectively disperse heat away from the optical chamber.

Drivers and connections are isolated from the EmitterDeck, further improving LED and driver life with projections of at least 60,000 hours of useful life (L_{70}).

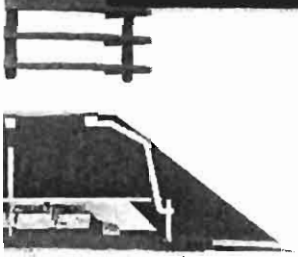


CONFIGURATION:	UCM-T3-60LED-BW	
MOUNTING HEIGHT:	12'	
POLE SPACING:	60'	
ROADWAY WIDTH:	48'	
FOOTCANDLES:	1.61 avg	1.61 avg/min
	2.3 max	2.3 max/min
	1.0 min	

Uniform Illumination

AAL's exclusive MicroEmitter control and 70°/60°/50° beam angle design limits glare, while maintaining wide pole spacing.

The result is **maximum throw** with **broad, comfortable, uniform illumination.**

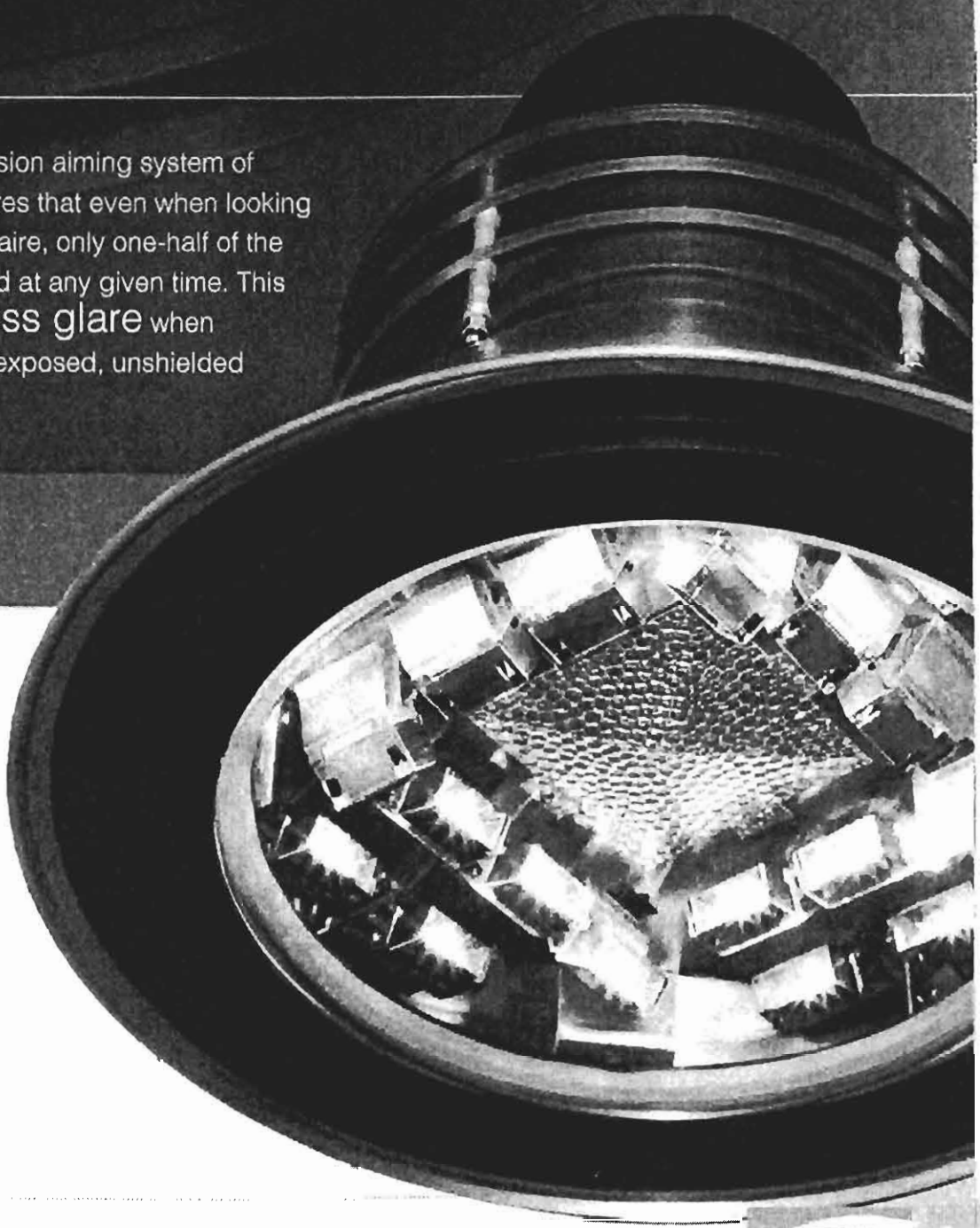


HOW IT WORKS

up to 50% LESS glare*

* Compared to exposed, unshielded LED systems.

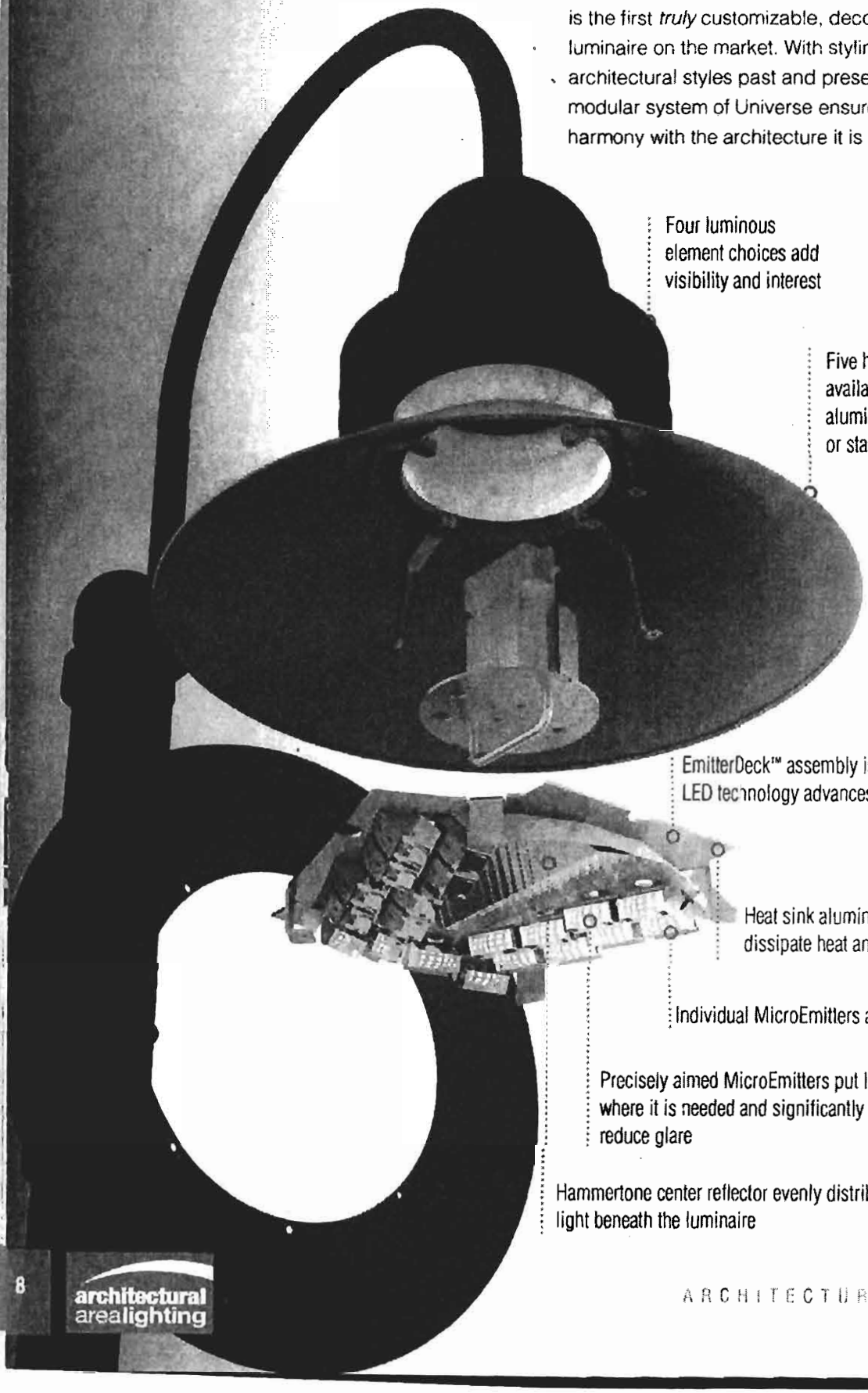
The exclusive precision aiming system of Universe LED ensures that even when looking directly at the luminaire, only one-half of the LEDs can be viewed at any given time. This results in 50% less glare when compared to other exposed, unshielded LED systems.



I-8

Design Excellence Universe® LED

Universe LED, part of AAL's **Designer SSL Series**, is the first *truly* customizable, decorative LED luminaire on the market. With styling that transcends architectural styles past and present, the unique modular system of Universe ensures a look that is in harmony with the architecture it is illuminating.



Four luminous element choices add visibility and interest

Five hood styles available in painted aluminum, copper, or stainless steel

EmitterDeck™ assembly is upgradeable as LED technology advances

Heat sink aluminum carrier plate helps dissipate heat and prolongs LED life

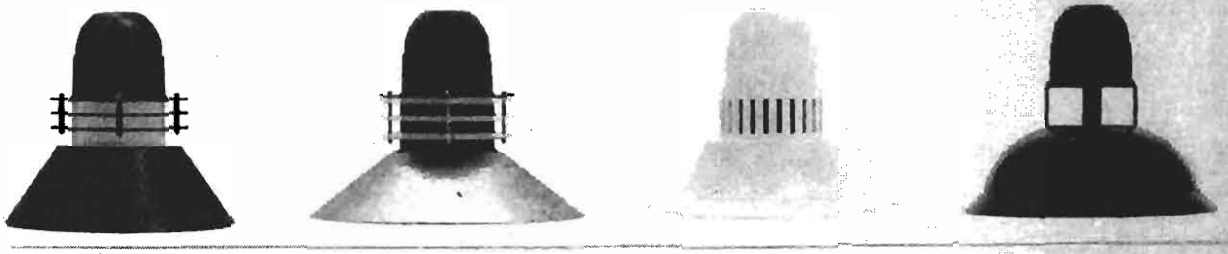
Individual MicroEmitters are field replaceable

Precisely aimed MicroEmitters put light where it is needed and significantly reduce glare

Hammertone center reflector evenly distributes light beneath the luminaire

I-9

UNIVERSE LED: The First LED Luminaire For Designers



HEAD

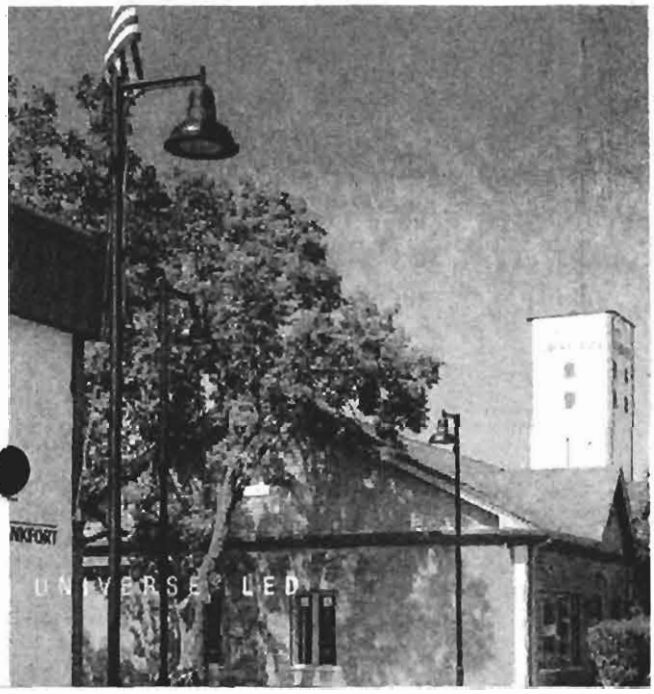
LUMINOUS ELEMENTS
Optional elements to add visibility and interest.

4 WINDOWS | SOLID RINGS | VERTICAL SLOTS | LUMINOUS RINGS

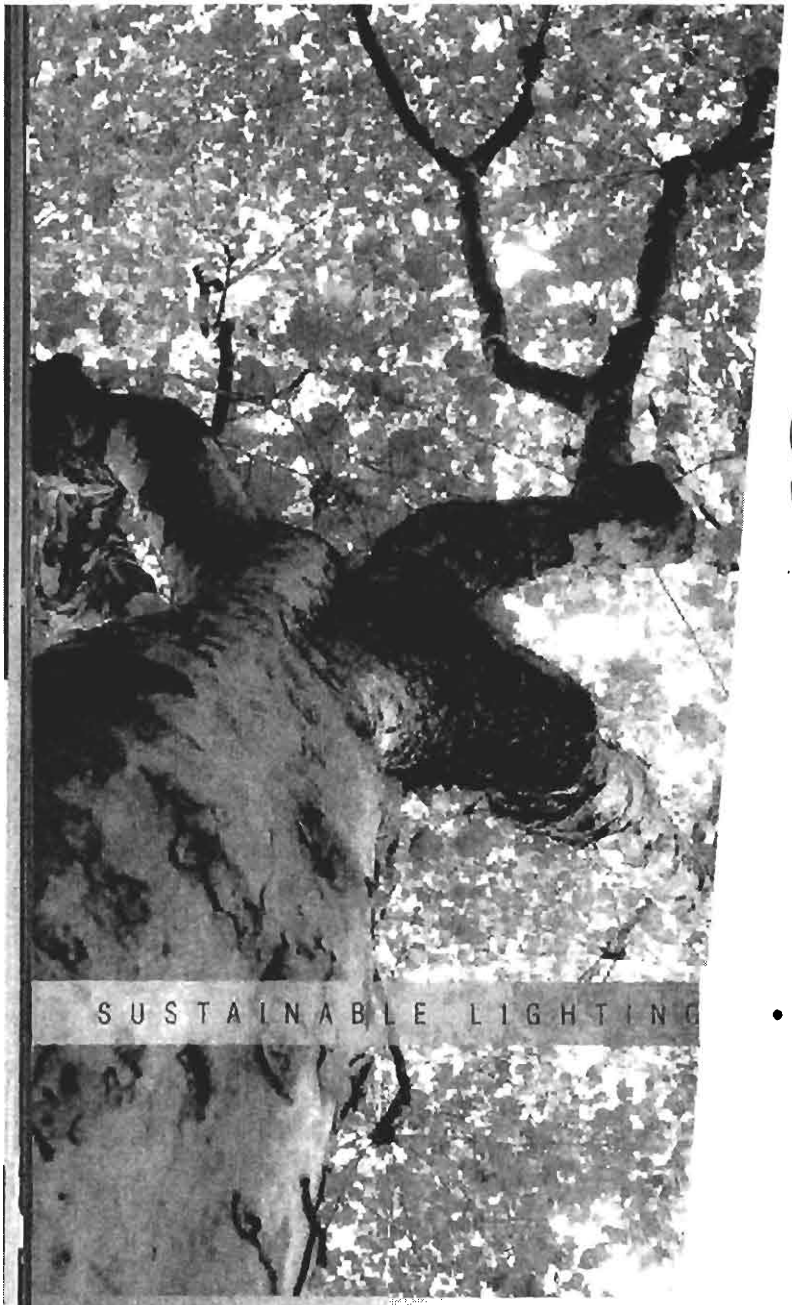
HOODS
Available in painted aluminum, natural copper, or stainless steel.

ANGLED | FLARED | STRAIGHT | BELL | SKIRTED BELL

The Universe hoods can be specified with natural copper or stainless steel to complement other design elements on the project.



I-10



energy **savings**

Energy
efficient
lighting solutions
can help reduce
lighting costs without
sacrificing light levels

SUSTAINABLE LIGHTING • ENERGY SAVINGS

Efficient
Effective
Eco-friendly

ida APPROVED

Universe LED offers a variety of dark sky friendly options.

I-11

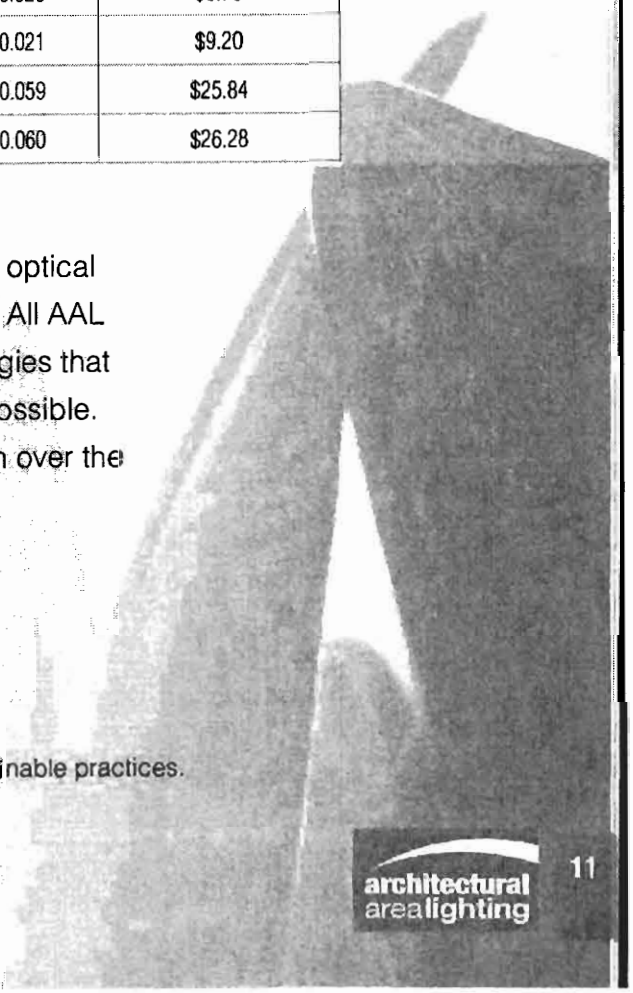
Universe® LED

CONVERT EXISTING
UCM HID HOUSINGS TO LED.

Limitations apply.
Contact factory.

Universe LED Energy Savings Guide

Description	Total Luminaire Wattage	Energy Savings (Watt)	Energy Savings (kW)	Energy Savings per Fixture per Year (12 hours per night @ $0.10 per kWh)
UCM LED	70			
70W MH	90	20	0.020	$8.76
70W HPS	91	21	0.021	$9.20
100W MH	129	59	0.059	$25.84
100W HPS	130	60	0.060	$26.28

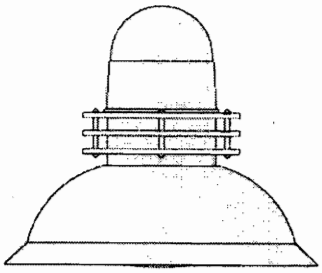


AAL is an industry leader in aesthetic design and optical performance, and in environmental responsibility. All AAL products are produced with sustainable technologies that have as small an impact on the environment as possible. Some of the responsible steps that AAL has taken over the years include:

- Using recycled content whenever possible
- Extensive factory recycling practices
- Using renewable energy sources
- Clean water stewardship practices

Visit www.aal.net for a complete listing of AAL's sustainable practices.

Universe LED
with MicroEmitter Technology



Luminous Rings and
Bell Hood Shown
HT: 14.5"-24.5"
DIA: 20"-24"
WT: 34.15 lbs

How to Order

1. Select Luminaire
2. Select Luminous Element
3. Select Hood
4. Select Optics/LED Configuration
5. Select Options
6. Select Color
7. Select Mounting

1. LUMINAIRE

UCM	Universe, medium housing size

2. LUMINOUS ELEMENT

(blank)	No Luminous Element	SR	Solid Rings
WND	4 Luminous Windows	VSL	Vertical Slots
LUM	Luminous Rings*		

3. HOOD

ANG	Angled Hood	STR	Straight Hood
BEL	Bell Hood	SKB	Skirted Bell
FLR	Flared Hood		

4. OPTICS/LED CONFIGURATION

T2-60LED-WW *(3500K)* T2-60LED-BW *(5100K)*
IES Type 2 distribution. 60 light emitting diode array (71 watts). 120 thru 277 volt.

T3-60LED-WW *(3500K)* T3-60LED-BW *(5100K)*
IES Type 3 distribution. 60 light emitting diode array (71 watts). 120 thru 277 volt.

T4-60LED-WW *(3500K)* T4-60LED-BW *(5100K)*
IES Type 4 distribution. 60 light emitting diode array (71 watts). 120 thru 277 volt.

T5-60LED-WW *(3500K)* T5-60LED-BW *(5100K)*
IES Type 5 distribution. 60 light emitting diode array (71 watts). 120 thru 277 volt.

All drivers are factory wired for 277 volts unless specified.

5. OPTIONS

EXTERNAL OPTIONS

FTG	Flat glass lens instead of standard sag glass lens.
RCK	Rock Guard. Painted black, attached to door frame.
SLC	Internal sleeve to block light from the lens when a Luminous Element is chosen.

HOOD OPTIONS

COP	Copper hood
STS	Stainless steel hood

*LUMINOUS OPTIONS

Optional inner lens for the LUM option adds color to the ring edges

BL	Blue inner lens
RD	Red inner lens
GRN	Green inner lens

6. COLOR

All 13 standard and 5 premium AAL colors available.
For RAL, please submit a four-digit RAL number or color chip for custom colors.

7. MOUNTING

Standard is arm mount. Please visit www.aal.net for the complete selection of decorative arms.

EXAMPLE

LUMINAIRE	LUMINOUS ELEMENT	HOOD	OPTICS/LED CONFIGURATION	OPTIONS	COLOR	MOUNTING
UCM	LUM	ANG	T3-60LED-BW	BL	CRT	Visit www.aal.net for mounting options

Specifications

Family	Luminaire Code	Distribution Type	LED Configuration*	Wattage Consumption	Lumen Output	Lumens per Watt	CCT
Universe	UCM-T3	Type 3	60LED-BW	70	3119	45	5100K
	UCM-T5	Type 5	60LED-BW	70	3063	44	5100K

*Driven at 350mA

HOUSING

The fixture ballast housing shall be one-piece die-cast aluminum with sag glass lens. The luminous elements shall be clear acrylic with an internal, lightly diffused acrylic lens which is sealed to the housing and shade with molded silicone gaskets. The hood and spacers shall be heavy gauge spun aluminum with hemmed edges for added rigidity. All internal and external hardware shall be stainless steel.

The fixture shall consist of die-cast aluminum door frame and ring assembly. The hood ring assembly shall be fully sealed with a molded silicone gasket. The door frame shall be hinged to the ring and opened with two captive fasteners for relamping. The tempered sag glass lens is held in the door frame with a molded silicone gasket.

MICROEMITTER

Precision injection molded, highly specular reflectors are positioned to achieve directional control toward desired task. Secondary reflectors with a concave, specular medium hammertone finish are used to redirect light downward. No fasteners are placed on the reflective surface. The entire assembly fastens to the housing as a one-piece module and features wiring quick-connects for easy installation. Standard color temperatures are 3500K and 5100K. Other color temperatures available. Please contact factory. MicroEmitters are individually field replaceable.

ELECTRICAL

120 thru 277 volt. All electrical components are mounted directly to the driver tray for maximum heat dissipation. The LED constant current driver operates at 350mA.

UPGRADE KITS

Field replaceable upgrade kits are available for UCM-H reflector models only. An entire EmitterDeck assembly, including drivers and 20 LED MicroEmitters (60 diodes), is provided. See installation instructions for complete details.

INSTALLATION AND MOUNTING

The fixture shall be attached to the arm assembly with three stainless steel bolts. The connection shall be sealed with a silicone compression gasket. The post top yoke mount version (PMR) shall slip over a 4"/100mm pole or tenon and secure with six stainless steel set screws.

FINISH

Fixture finish consists of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.

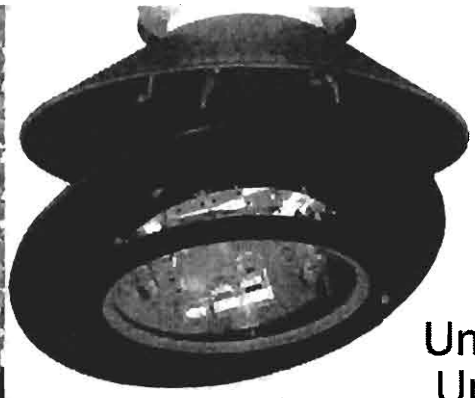
CERTIFICATION

Fixture shall be listed with ETL for outdoor, wet location use, UL1598 and Canadian CSA Std. C22.2 no.250. IP=65

WARRANTY

UCM LED is warranted for five years including housing, LEDs, and electrical components. Any unauthorized return, repair, replacement or modification of the Product(s) shall void this warranty. This warranty applies only to the use of the Product(s) as intended by AAL and does not cover poles, arms, mounting, or any misapplication or misuse of said Product(s), or installation in hazardous or corrosive environments. Contact AAL for complete warranty language, exceptions, and limitations.

5 YEAR WARRANTY



Universe LED Upgrade Kits

Upgrade kits are available for UCM-H reflector models to replace LED EmitterDecks in the future or to retrofit existing Universe installations. An entire EmitterDeck assembly, including drivers and 20 LED MicroEmitters (60 diodes), is provided.

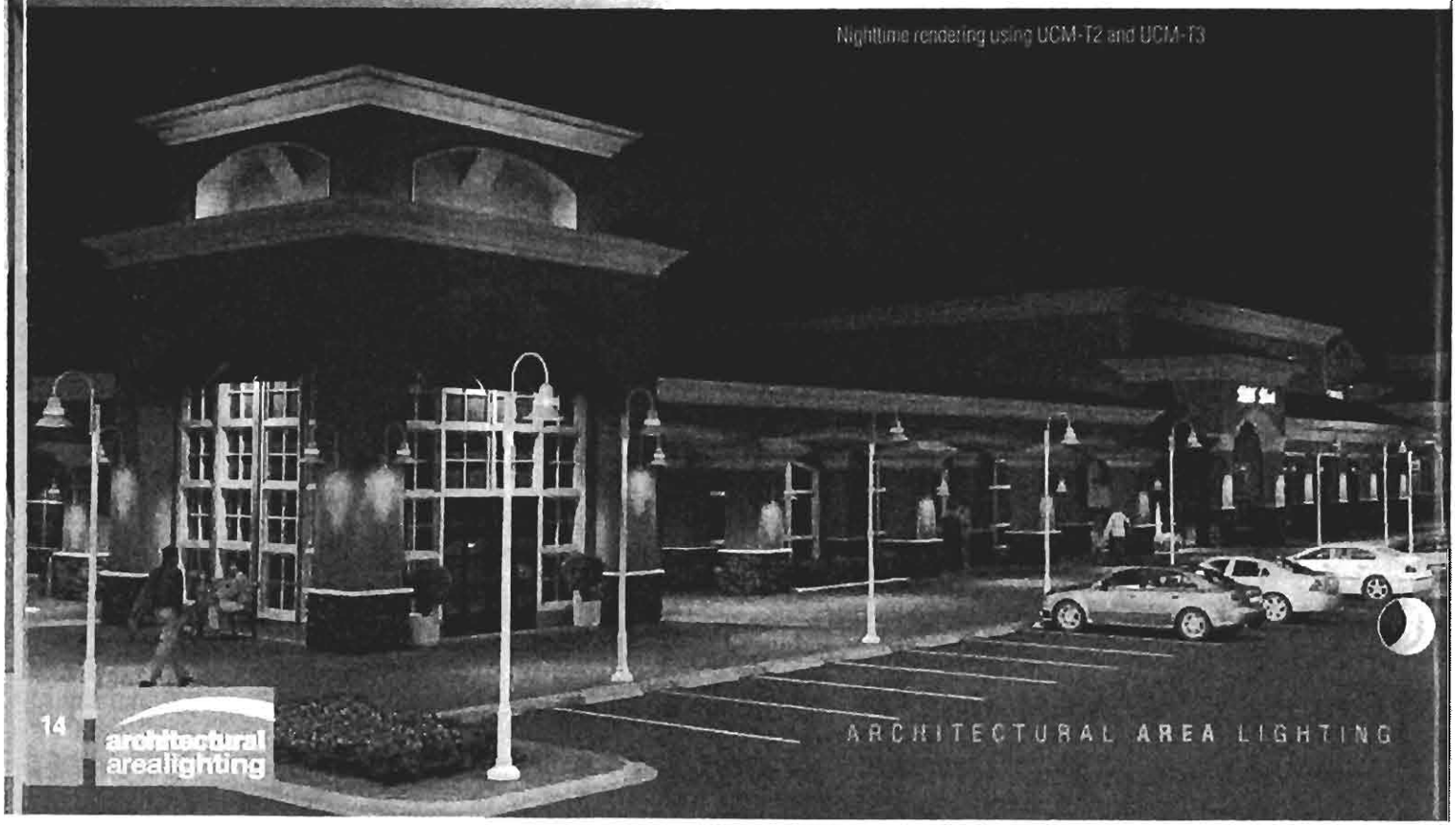
Upgradeable LED System

Universe LED's unique **EmitterDeck™** design allows for easy changeout in the field. Think of this like a personal computer system. The Universe LED is the hardware and its easily replaceable EmitterDeck is the software. As LED technology advances and becomes even more efficient, Universe LED's upgradeable, sustainable solution will meet the needs of your community today and in the future. Communities can take advantage of the newest LED technology without the added expense of removing and replacing an entire fixture.

Convert HID & CFL to LED

Easy Maintenance

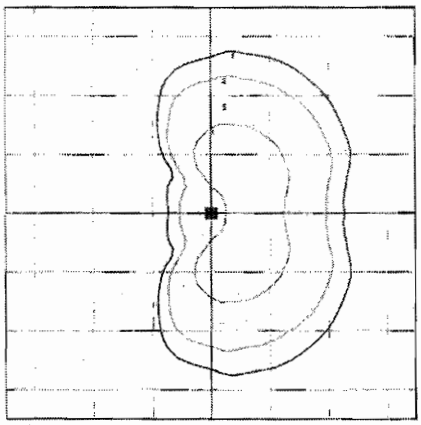
To replace the LED EmitterDeck, two captive screws open the hinged door. Four stainless steel screws hold the carrier plate in place with four stainless steel screws securing the EmitterDeck.



Nighttime rendering using UCM-T2 and UCM-T3

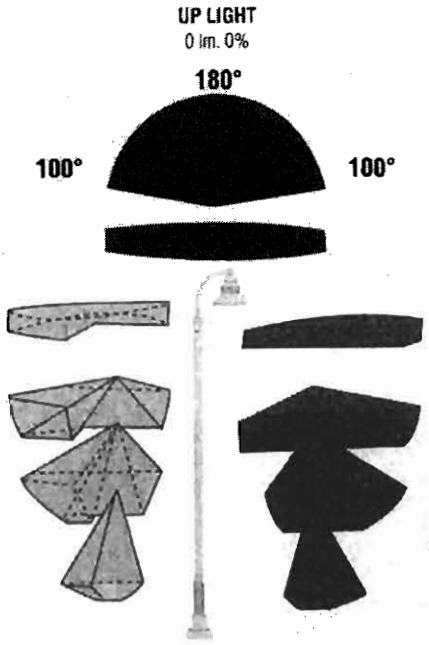
Photometry

UCM-T3 Type 3



Mounting Height: 12 feet
Total flux: 3119 lm
Watts: 70 W
LPW: 45

BUG Ratings

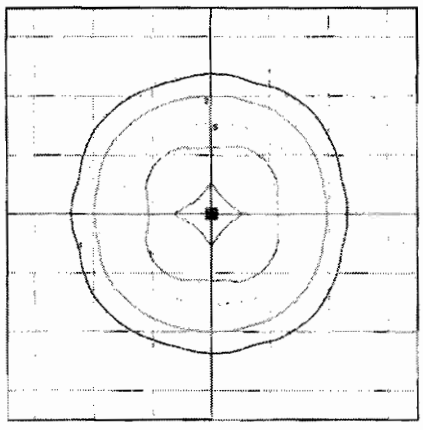


B1 U1 G1

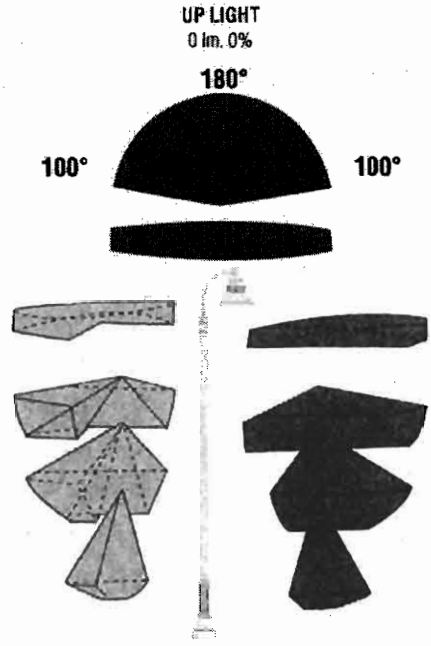
photometric **integrity**

All photometry tests were performed by an independent, certified photometric laboratory under strict LM-79-08 standards. AAL only uses IES-LM-80 compliant LED components.

UCM-T5 Type 5



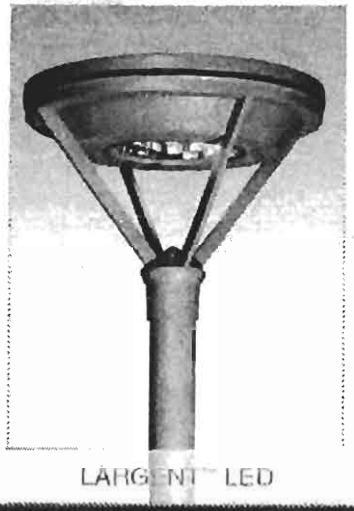
Mounting Height: 12 feet
Total flux: 3063 lm
Watts: 70 W
LPW: 44



B2 U1 G0

Visit www.aal.net to learn more about BUG ratings and for a complete listing of IES reports.

UNIVERSE™ LED



LARGENT™ LED

PROVI[illegible]CE™ LED

DESIGNER SSL SERIES

FEATURING MICROEMITTER™ TECHNOLOGY

For more information on any of AAL's LED products, please visit us at

www.aal.net/aal/ucmled.html

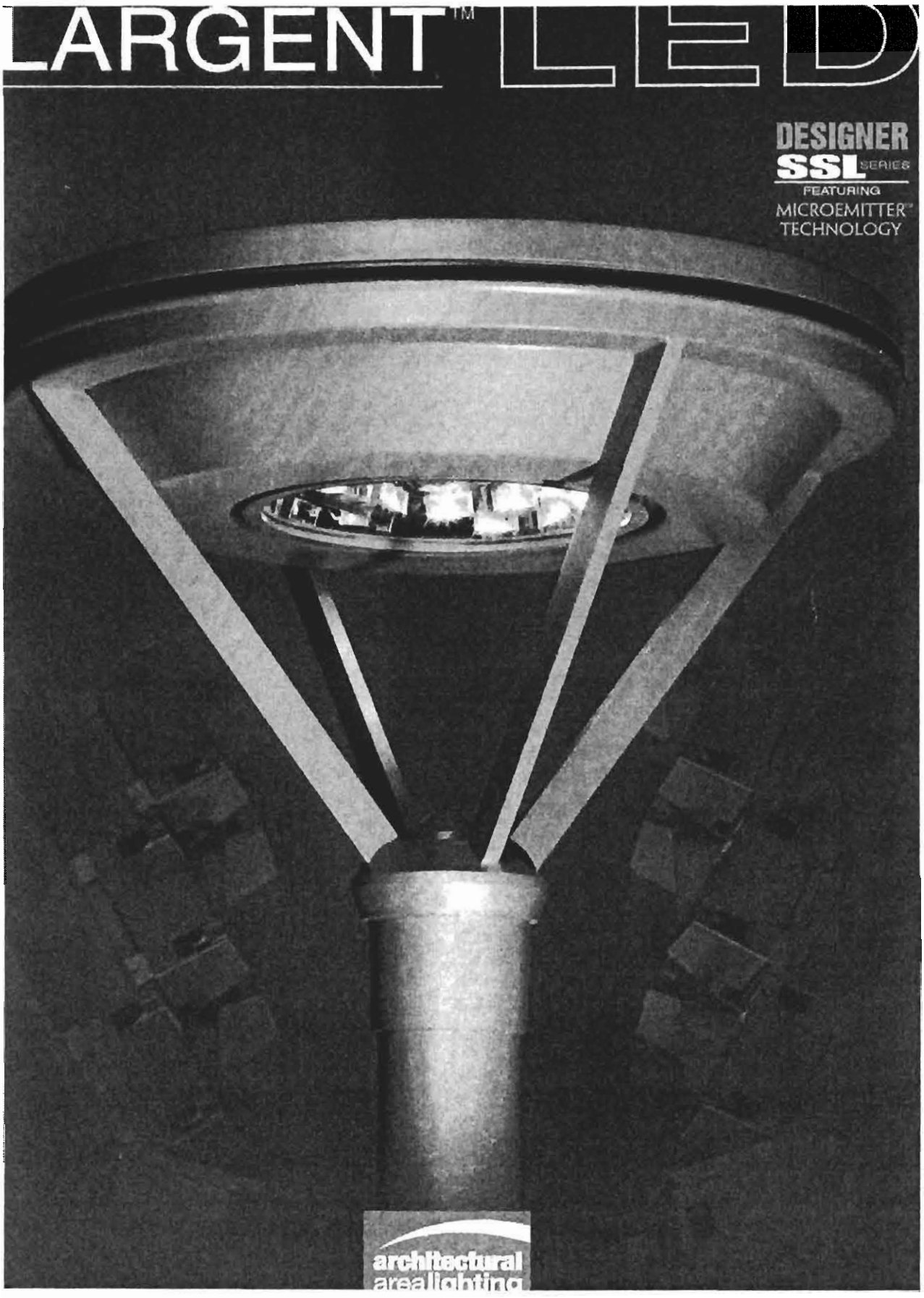
architectural arealighting

LED

HUBBELL

16555 East Gale Ave. | City of Industry | CA 91745
T 626.968.5606 | F 626.369.2695 | www.aal.net
www.aal.net/aal/ucmled.html

H-12


LARGENT™ LED
DESIGNER
SSL SERIES
FEATURING
MICROEMITTER® TECHNOLOGY
architectural
arealighting

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the power of

LED.

Contents

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5 YEAR WARRANTY

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in a
timeless
form

LARGENT™ LED

Part of AAL's
Designer SSL Series

architectural
arealighting

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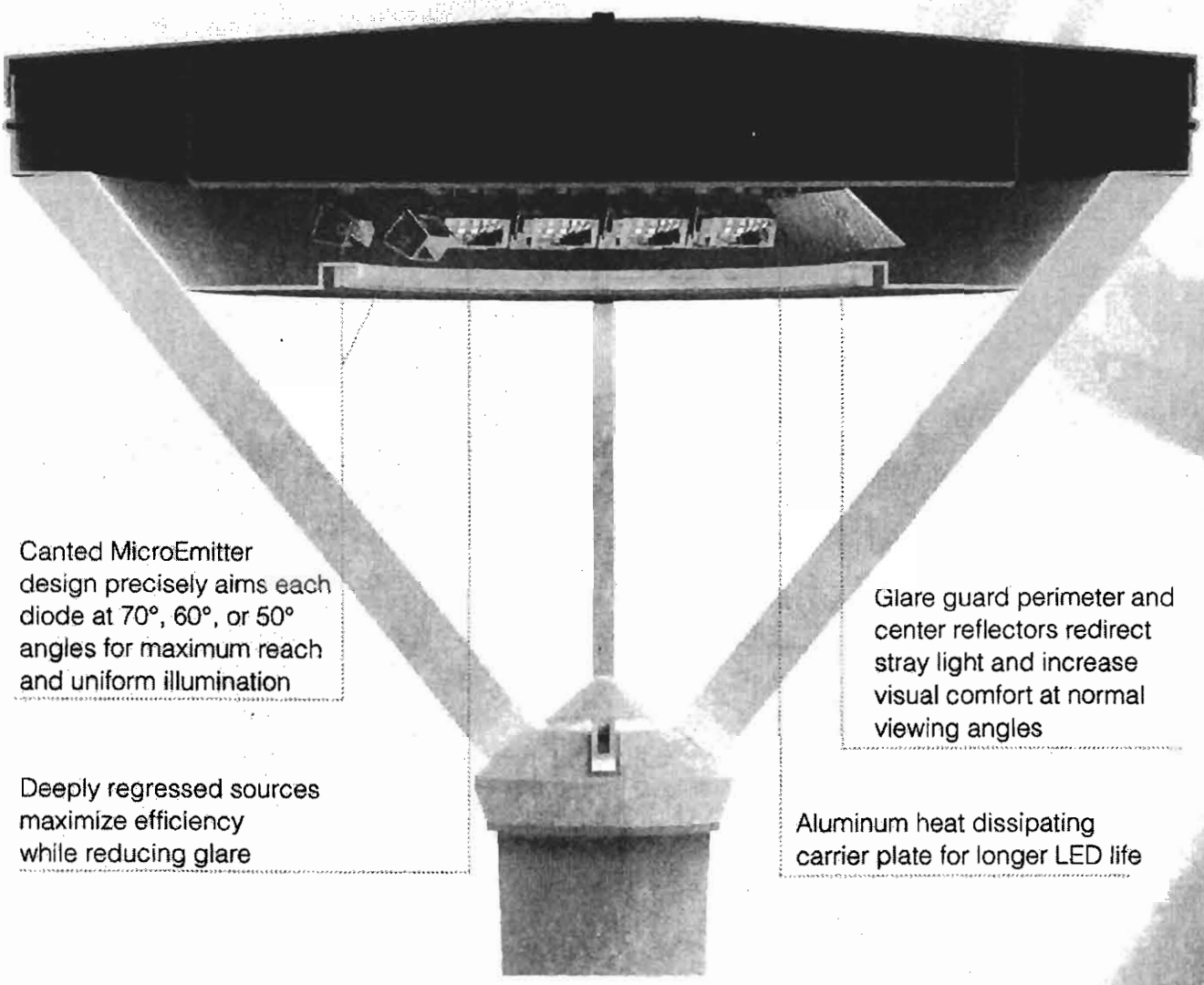
Featuring Exclusive
MicroEmitter™
Technology

Largent™ LED



Canted MicroEmitter design precisely aims each diode at 70°, 60°, or 50° angles for maximum reach and uniform illumination

Deeply regressed sources maximize efficiency while reducing glare

Glare guard perimeter and center reflectors redirect stray light and increase visual comfort at normal viewing angles

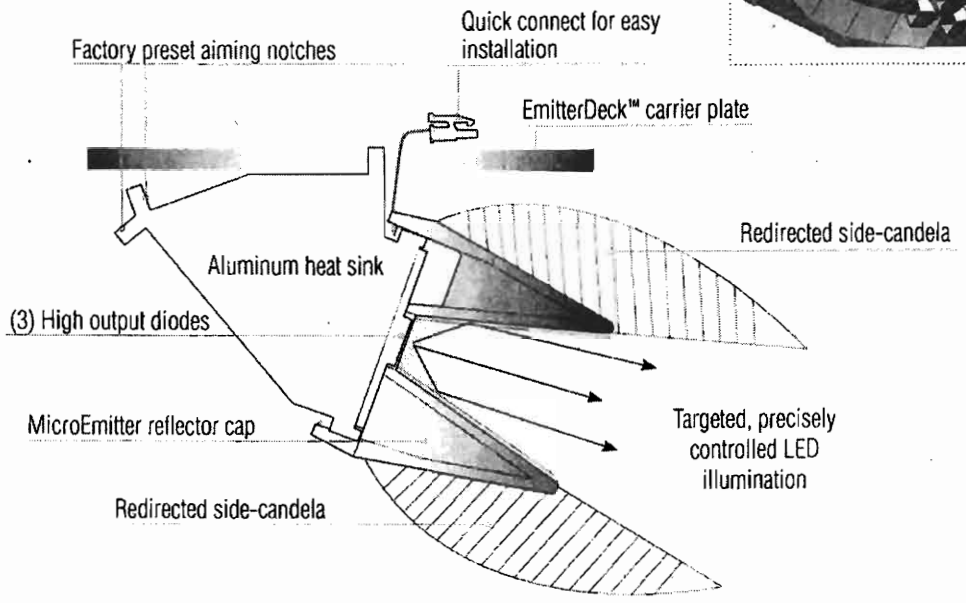
Aluminum heat dissipating carrier plate for longer LED life

I-21

Revolutionary Technology for Superior LED Performance

AAL's upgradeable EmitterDeck™ design consists of an array of twenty replaceable MicroEmitter modules that tightly and precisely control powerful LED output. A secondary perimeter reflector contained within the housing redirects any stray light. The result is powerful, comfortable, uniform illumination.

Replaceable EmitterDeck assembly

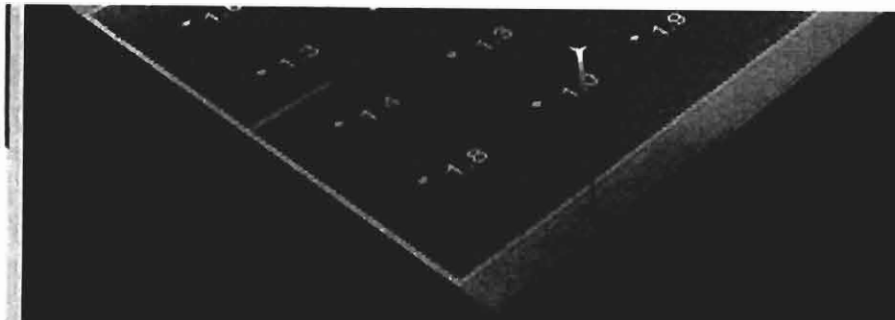


PATENTS PENDING

Illustration of a single MicroEmitter at 70° angle

Advanced Thermal Management

Each MicroEmitter incorporates a solid aluminum heat sink, which is then fastened to the EmitterDeck, a thick aluminum carrier plate designed to maximize cooling surface area. The module is then fixed to Largent's spun aluminum housing to effectively disperse heat away from the optical chamber.



CONFIGURATION:	SLVT-T3-60LED-BW	
MOUNTING HEIGHT:	15'	
POLE SPACING:	60'	
ROADWAY WIDTH:	48'	
FOOTCANDLES:	1.32 avg	2.64 avg/min
	2.0 max	4.00 max/min
	0.5 min	

Uniform Illumination

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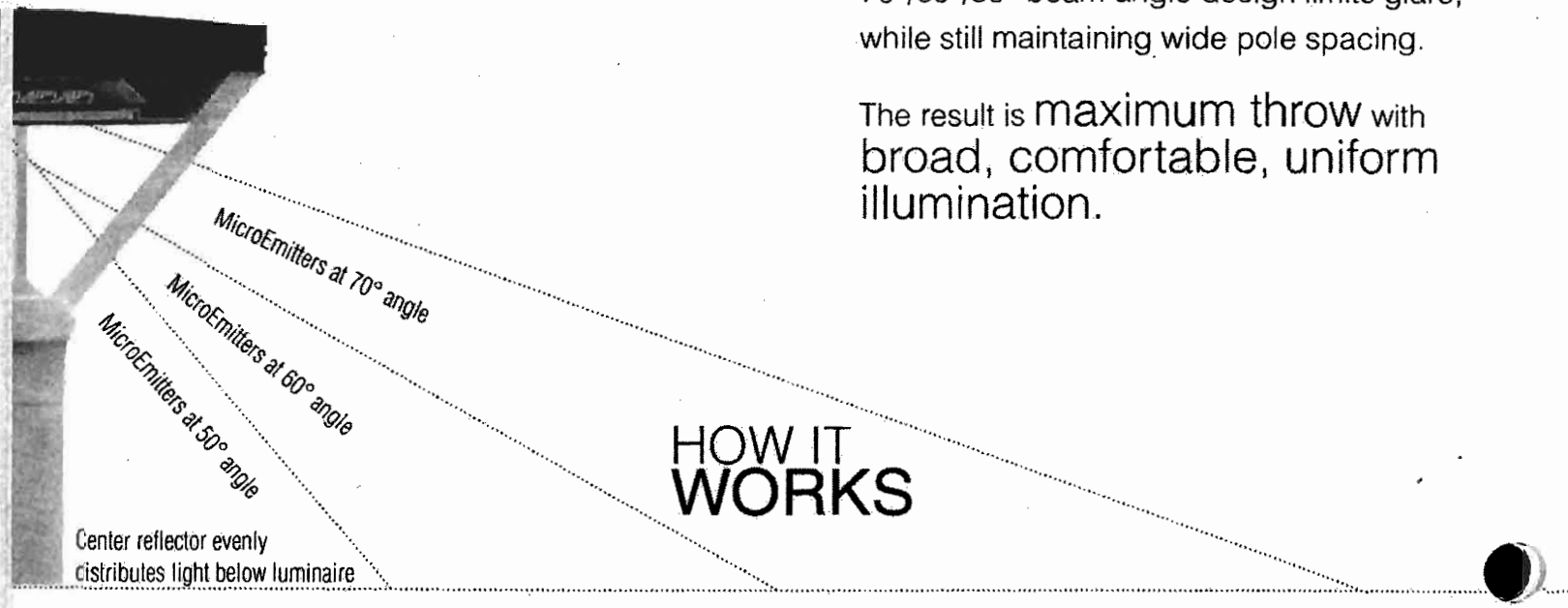
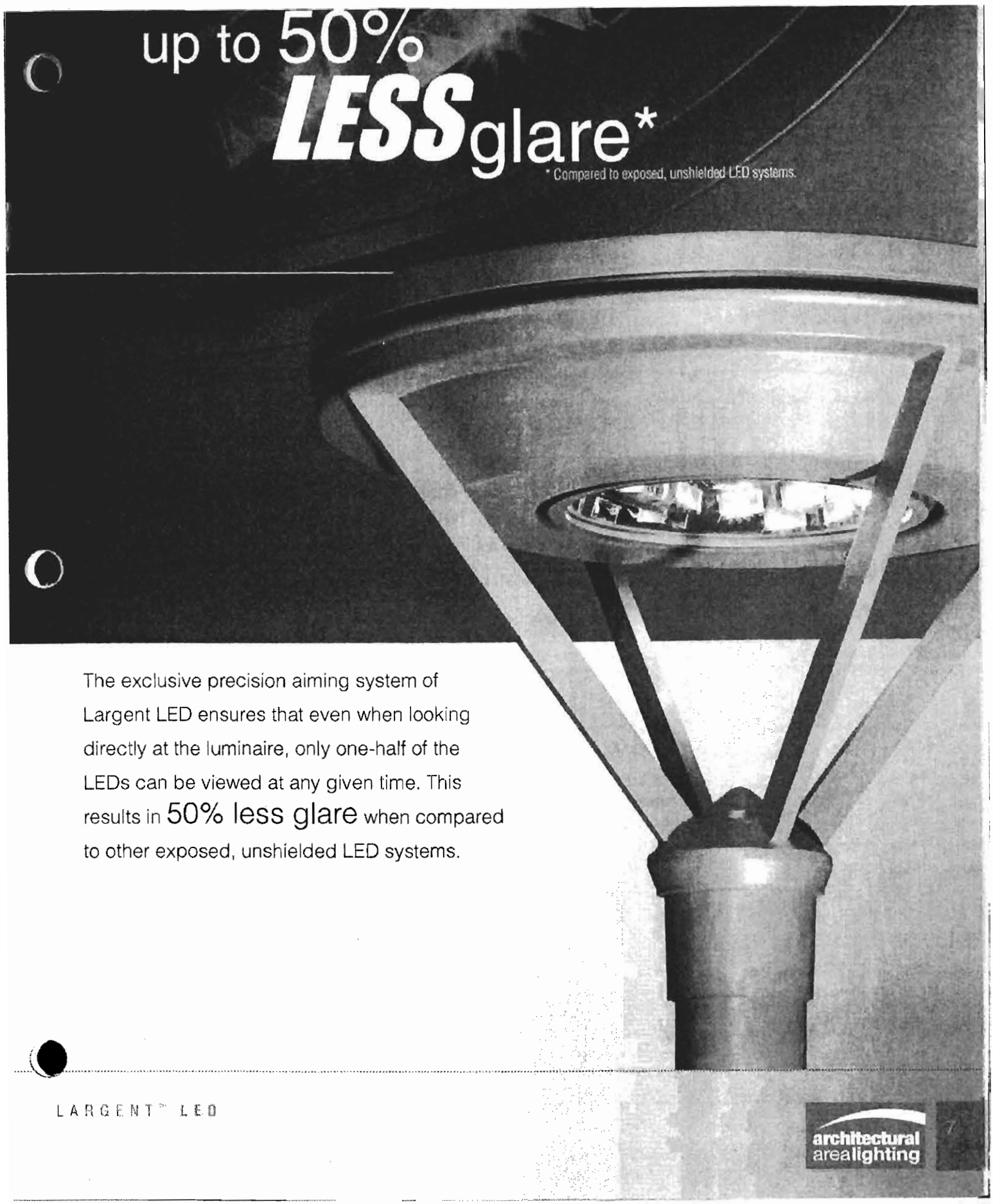
The result is **maximum throw** with **broad, comfortable, uniform illumination.**



HOW IT WORKS

T-22



The exclusive precision aiming system of Largent LED ensures that even when looking directly at the luminaire, only one-half of the LEDs can be viewed at any given time. This results in 50% less glare when compared to other exposed, unshielded LED systems.

LARGENT™ LED

architectural arealighting

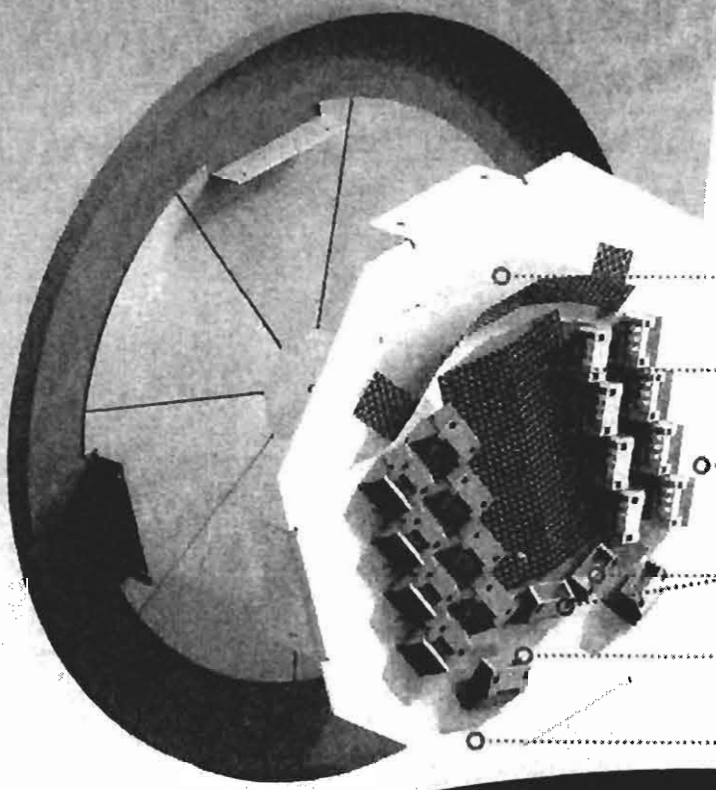
I-24

Design Excellence

Largent LED, part of AAL's

Designer SSL Series,

is the first post top luminaire to feature exclusive MicroEmitter LED technology. The clean contemporary styling of Largent stands the test of time.



Glare guard perimeter reflector redirects stray light

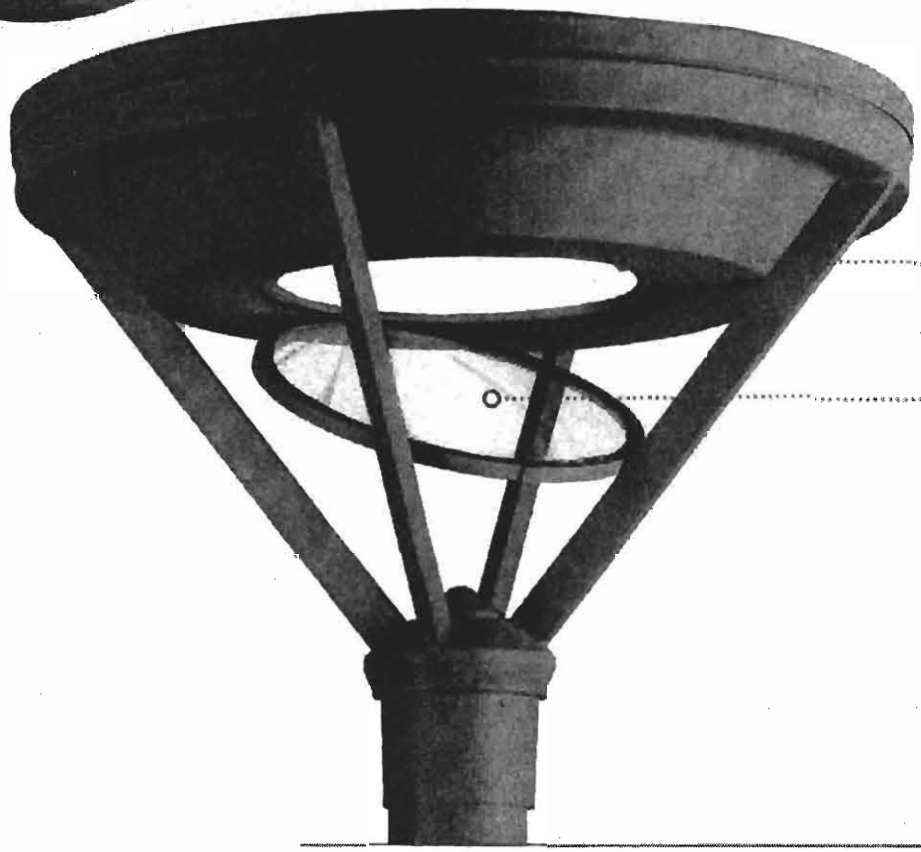
Hammertone center reflector evenly distributes light directly below the luminaire

Heat sink aluminum carrier plate helps dissipate heat and prolongs LED life

Precisely aimed MicroEmitters put light where it is needed and significantly reduce glare

MicroEmitters are individually field replaceable

EmitterDeck assembly is upgradeable as LED technology advances



One-piece memory retentive silicone gasket

Tempered glass lens will not yellow over time

I-25

Upgradeable LED System

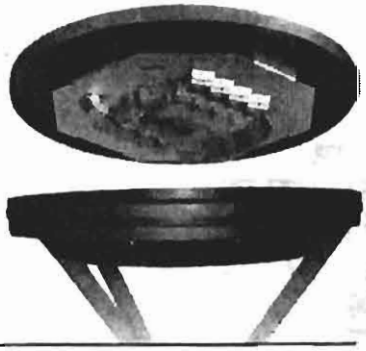
Largent LED's unique **EmitterDeck** design allows for easy changeout in the field. Think of this like a personal computer system. The Largent LED is the hardware and its easily replaceable EmitterDeck is the software. As LED technology advances and becomes even more efficient, Largent LED's upgradeable, sustainable solution will meet the needs of your community today and in the future. Communities can take advantage of the newest LED technology without the added expense of removing and replacing an entire fixture.

Easy Maintenance

To replace the LED EmitterDeck, two captive screws open the hinged door. Four stainless steel screws hold the carrier plate in place with four stainless steel screws securing the EmitterDeck.

UPGRADE KITS

Upgrade kits are available for SLVT-H reflector models to replace LED EmitterDecks in the future or to retrofit existing Largent installations. An entire EmitterDeck assembly, including drivers and 20 LED MicroEmitters (60 diodes), is provided.



Convert HID & CFL to LED

I-24

energy savings

Energy efficient lighting solutions can help reduce lighting costs without sacrificing light levels

SUSTAINABLE LIGHTING • ENERGY SAVINGS

Efficient
Effective
Eco-friendly

Largent LED offers a variety of dark sky friendly options.

CONVERT EXISTING
SLVT HID HOUSINGS TO LED.

Limitations apply.
Contact factory.

Largent LED Energy Savings Guide

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SLVT-LED	70.1			
70W MH	90	19.9	0.020	$8.72
70W HPS	91	20.9	0.021	$9.15
100W MH	129	58.9	0.059	$25.80
100W HPS	130	59.9	0.060	$26.24

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- Using recycled content whenever possible
- Extensive factory recycling practices
- Using renewable energy sources
- Clean water stewardship practices

Visit www.aal.net for a complete listing of AAL's sustainable practices.

LARGENT LED

architectural arealighting

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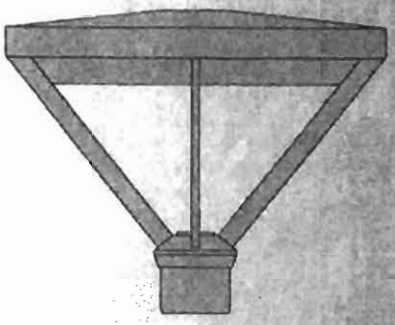
Largent™ LED

with MicroEmitter Technology



Largent
HT: 25.5"
DIA: 20"
WT: 32 lbs

How to Order

1. Select Luminaire and LED Configuration
2. Select Color
3. Select Mounting

1 LUMINAIRE AND LED CONFIGURATION

SLVT-T2-60LED-WW
IES Type 2 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

SLVT-T2-60LED-BW
IES Type 2 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

SLVT-T3-60LED-WW
IES Type 3 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

SLVT-T3-60LED-BW
IES Type 3 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

SLVT-T4-60LED-WW
IES Type 4 distribution. 60 light emitting diode array (70watts). Warm white (3500K). 120 thru 277 volt.

SLVT-T4-60LED-BW
IES Type 4 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

SLVT-T5-60LED-WW
IES Type 5 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

SLVT-T5-60LED-BW
IES Type 5 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

2 COLOR

All 13 standard and 5 premium AAL colors available.
For RAL, please submit a four-digit RAL number or color chip for custom colors.

3 MOUNTING

Select post top mount on a 4" or into a 5" O.D. pole or choose from a wide variety of arms. Please visit www.aal.net for the complete selection of decorative arms.

EXAMPLE	LUMINAIRE	LED CONFIGURATION	COLOR	MOUNTING
	SLVT-T2	60LED-WW	BLK	Visit www.aal.net for mounting options

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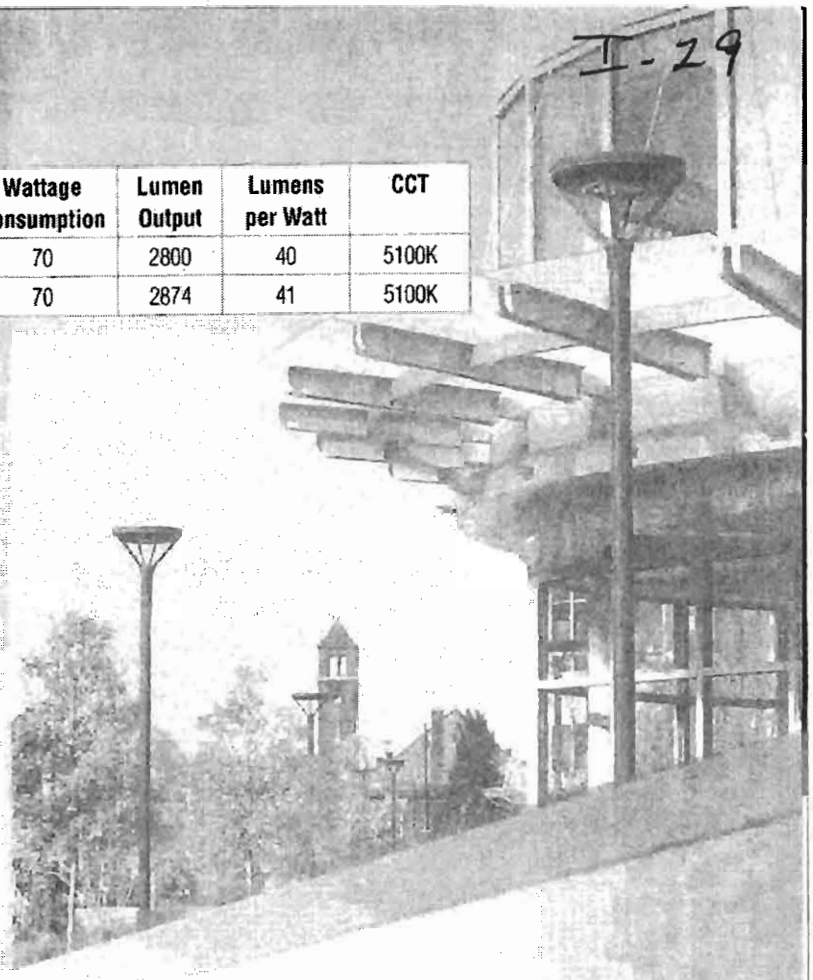
Specifications

Family	Luminaire Code	Distribution Type	LED Configuration*	Wattage Consumption	Lumen Output	Lumens per Watt	CCT
Largent	SLVT-T3	Type 3	60LED-BW	70	2800	40	5100K
	SLVT-T5	Type 5	60LED-BW	70	2874	41	5100K

**Driven at 350mA*



HOUSING

The fixture fitter shall be one-piece cast aluminum. The upper housing shall be spun aluminum. The top shall be removable to access the EmitterDeck assembly. The top shall be secured with four captive, slotted screws. All hardware shall be stainless steel.

ELECTRICAL

120 thru 277 volt. All electrical components are mounted directly to the MicroEmitter assembly for maximum heat dissipation. LED constant current driver operates at 350mA.

MICROEMITTER

Precision injection molded, highly specular reflectors are positioned to achieve directional control toward desired task for IES cutoff classification. Secondary reflectors with a concave, specular medium hammertone finish are used to redirect light downward. No fasteners are placed on the reflective surface. The entire assembly fastens to the housing as a one-piece module and features wiring quick-connects for easy installation. Standard color temperatures are 3500K and 5100K. Other color temperatures available. Please contact factory. MicroEmitters are individually field replaceable.

MOUNTING

Fixture slips over a 4"/100mm or into 5"/127mm O.D. pole. Maximum .188" thick pole wall for post top mounting.

UPGRADE KITS

Field replaceable upgrade kits available for SLVT-H reflector models only. An entire EmitterDeck assembly, including drivers and 20 LED MicroEmitters (60 diodes) is provided along with a replacement dome assembly for the fixture. Please specify dome assembly color (new dome assembly color may differ slightly due to weatherization). See installation instructions for complete details.

FINISH

The finish consists of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.

CERTIFICATION

Fixture shall be listed with ETL for outdoor, wet location use, UL1598 and Canadian CSA C22.2 no.250. IP= 66

WARRANTY

Largent LED is warranted for five years including housing, LEDs, and electrical components. Any unauthorized return, repair, replacement or modification of the Product(s) shall void this warranty. This warranty applies only to the use of the Product(s) as intended by AAL and does not cover poles, arms, mounting, or any misapplication or misuse of said Product(s), or installation in hazardous or corrosive environments. Contact AAL for complete warranty language, exceptions, and limitations.

5 YEAR WARRANTY

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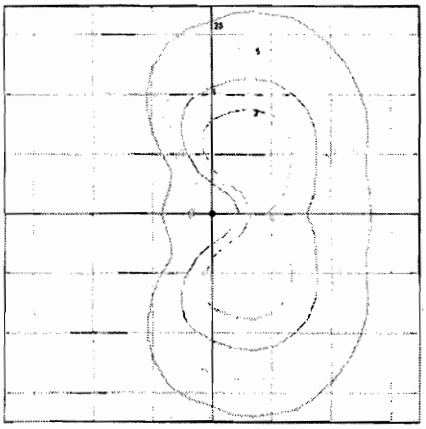
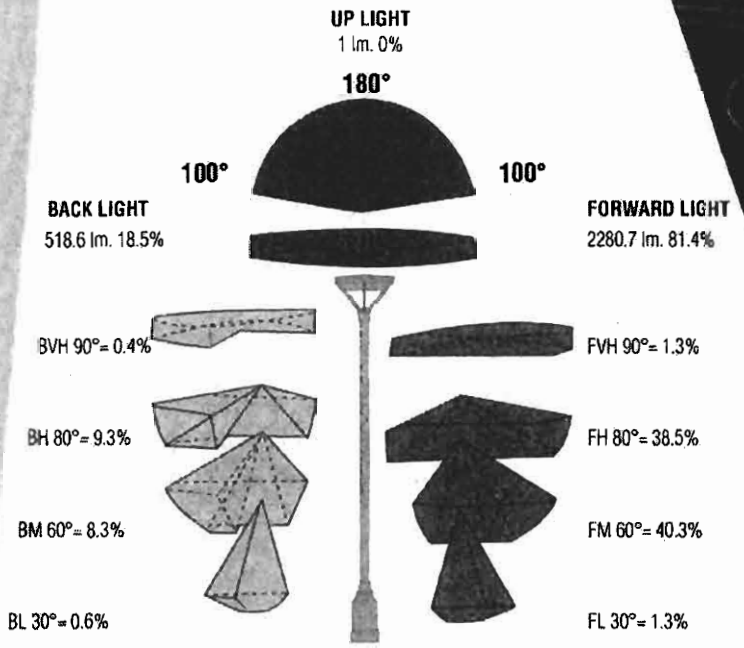
SLVT-T3 Type 3



Mounting Height: 10 feet
Total flux: 2800 lm
Watts: 70 W
LPW: 40

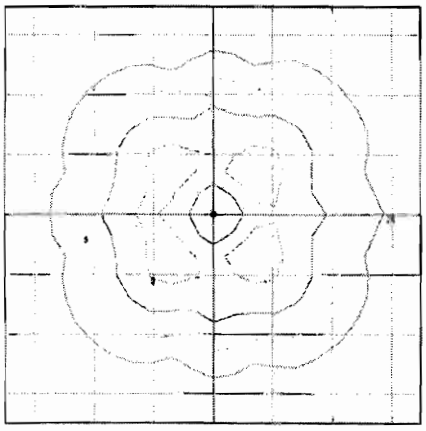
Photometry



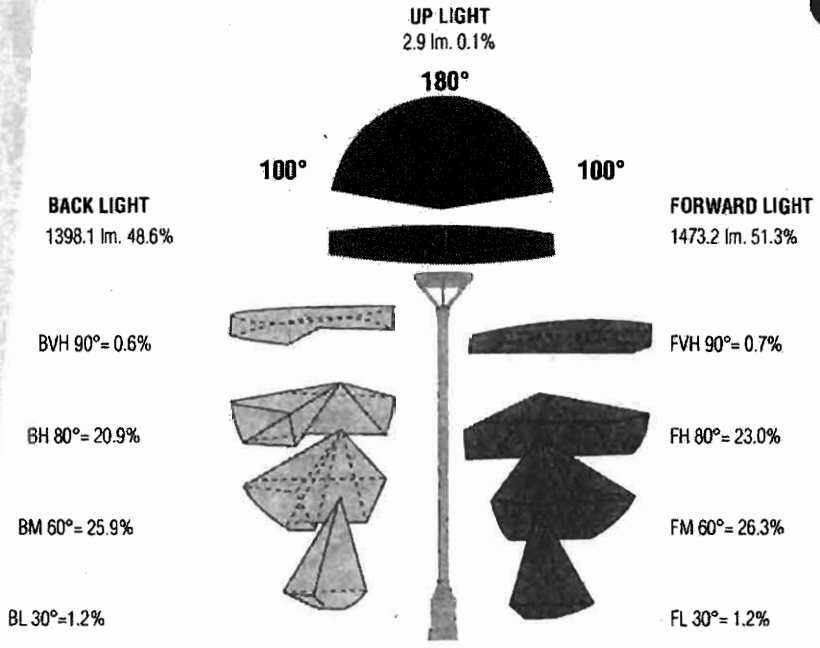
B1 U1 G1

BUG Ratings

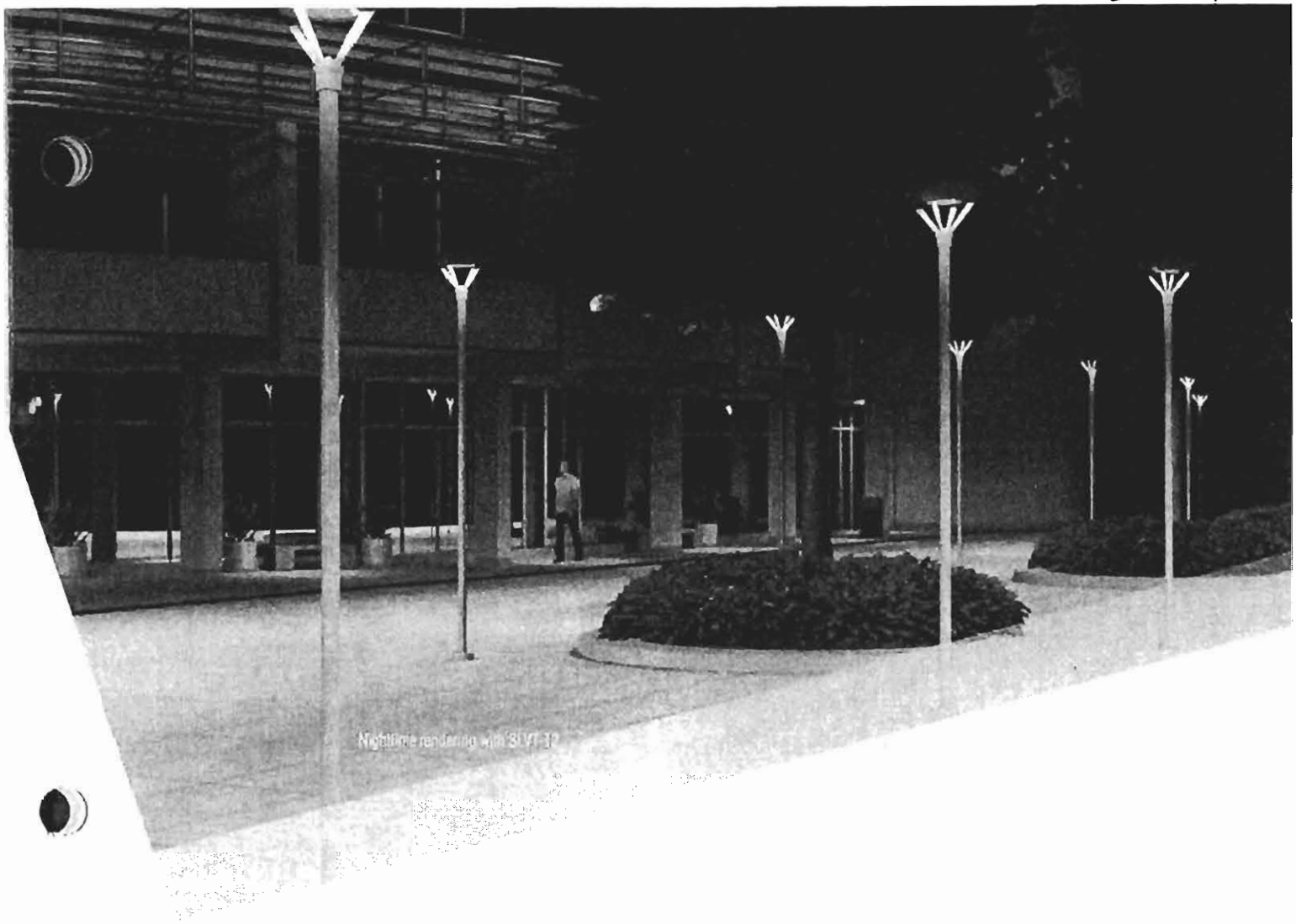
SLVT-T5 Type 5



Mounting Height: 10 feet
Total flux: 2874 lm
Watts: 70 W
LPW: 41



B2 U1 G0



photometric **integrity**

All photometry tests were performed by an independent, certified photometric laboratory under strict LM-79-08 standards. In addition, AAL only uses IES-LM-80 compliant LED components.

*Please visit **www.aal.net** to learn more about BUG ratings and for a complete listing of IES reports.*

UNIVERSE® LED

LARGENT™ LED

PROVI[illegible]CE® LED

DESIGNER SSL SERIES

FEATURING MICROEMITTER™ TECHNOLOGY

For more information on any of AAL's LED products, please visit us at

www.aal.net/aal/slvtled.html

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LED

HUBBELL

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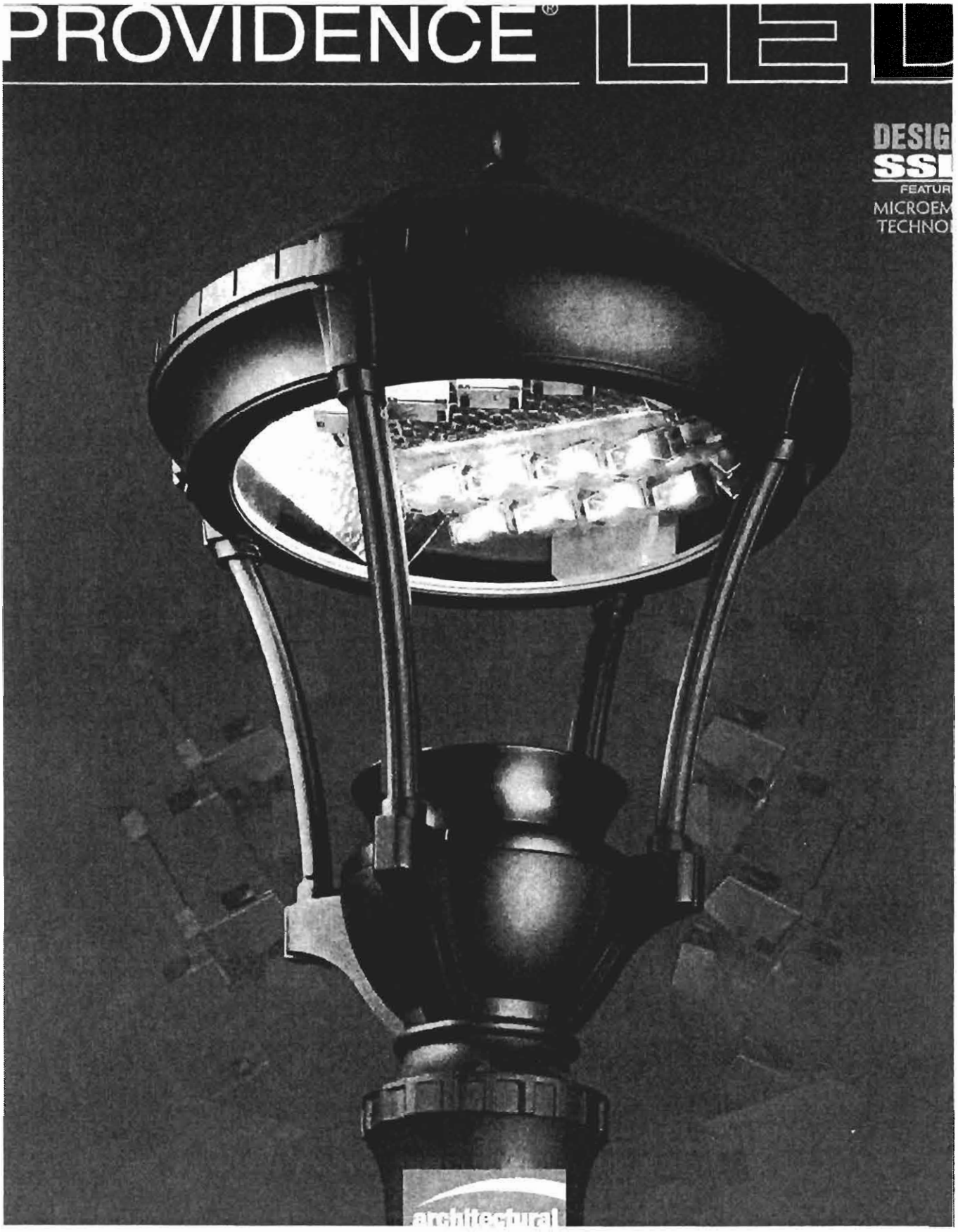
www.aal.net/aal/slvtled.html


PROVIDENCE®
DESIG
SSL
FEATUR
MICROEM
TECHNO
architectural

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the power of LED.

Contents

AIA AAF CORNERSTONE PARTNER

ASLA CPE

ida

ENERGY STAR PARTNER

MADE IN USA

PATENTS PENDING

5 YEAR WARRANTY

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ARCHITECTURAL AREA LIGHTING

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in an *elegant* traditional form

PROVIDENCE® LED

Part of AAL's Designer SSL Series

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Featuring Exclusive
MicroEmitter™ Technology

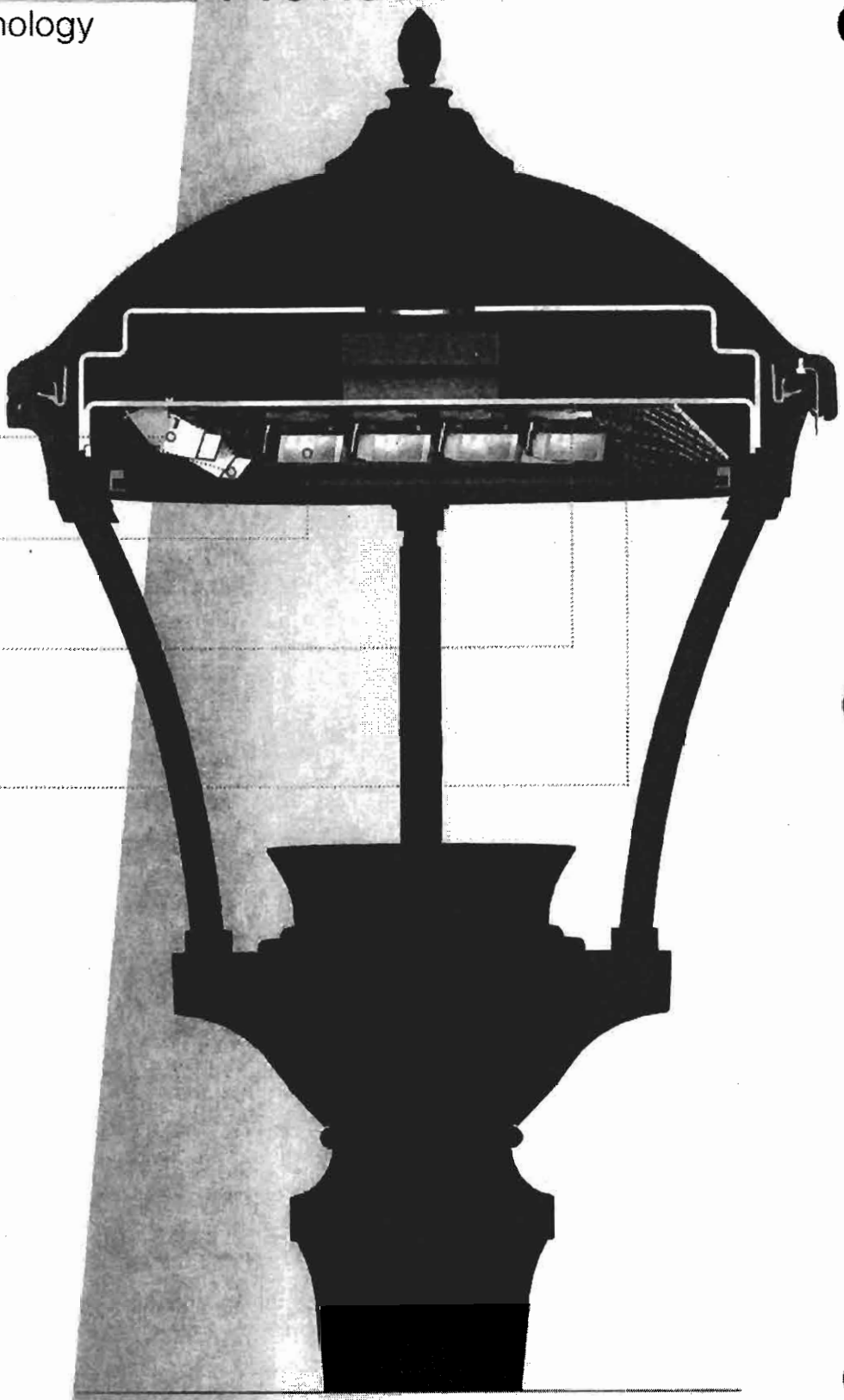
Providence® LED

Canted MicroEmitter design precisely aims each diode, at 70°, 60°, or 50° angles for maximum reach and uniform illumination

Deeply regressed sources maximize efficiency while reducing glare

Aluminum heat dissipating carrier plates for longer LED life

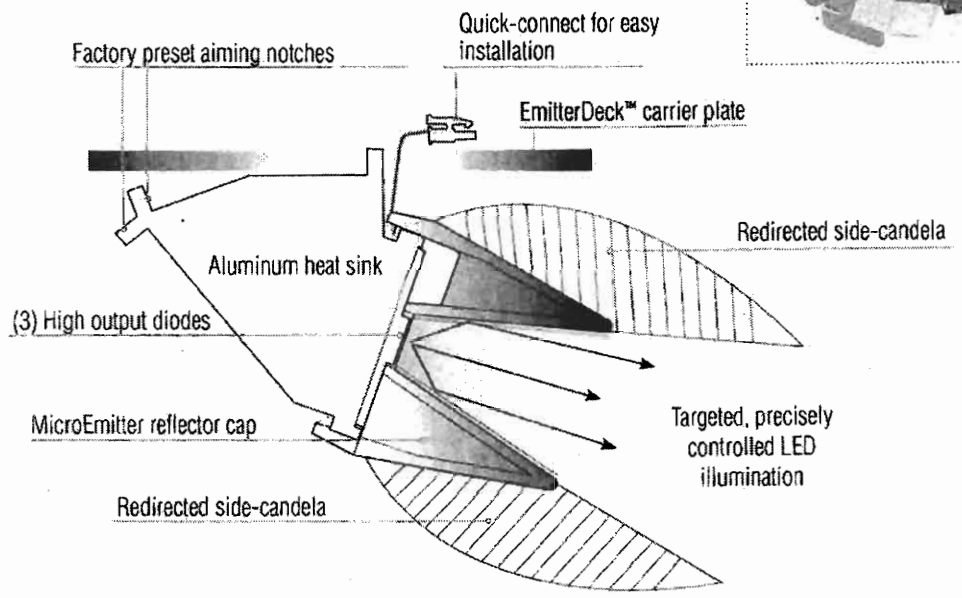
Glare guard perimeter and center reflectors redirect stray light and increase visual comfort at normal viewing angles



Revolutionary Technology for Superior LED Performance

AAL's upgradeable EmitterDeck™ design consists of an array of twenty replaceable MicroEmitter modules that tightly and precisely control powerful LED output. A secondary perimeter reflector contained within the housing redirects any stray light. The result is powerful, comfortable, uniform illumination.

Replaceable EmitterDeck™ assembly



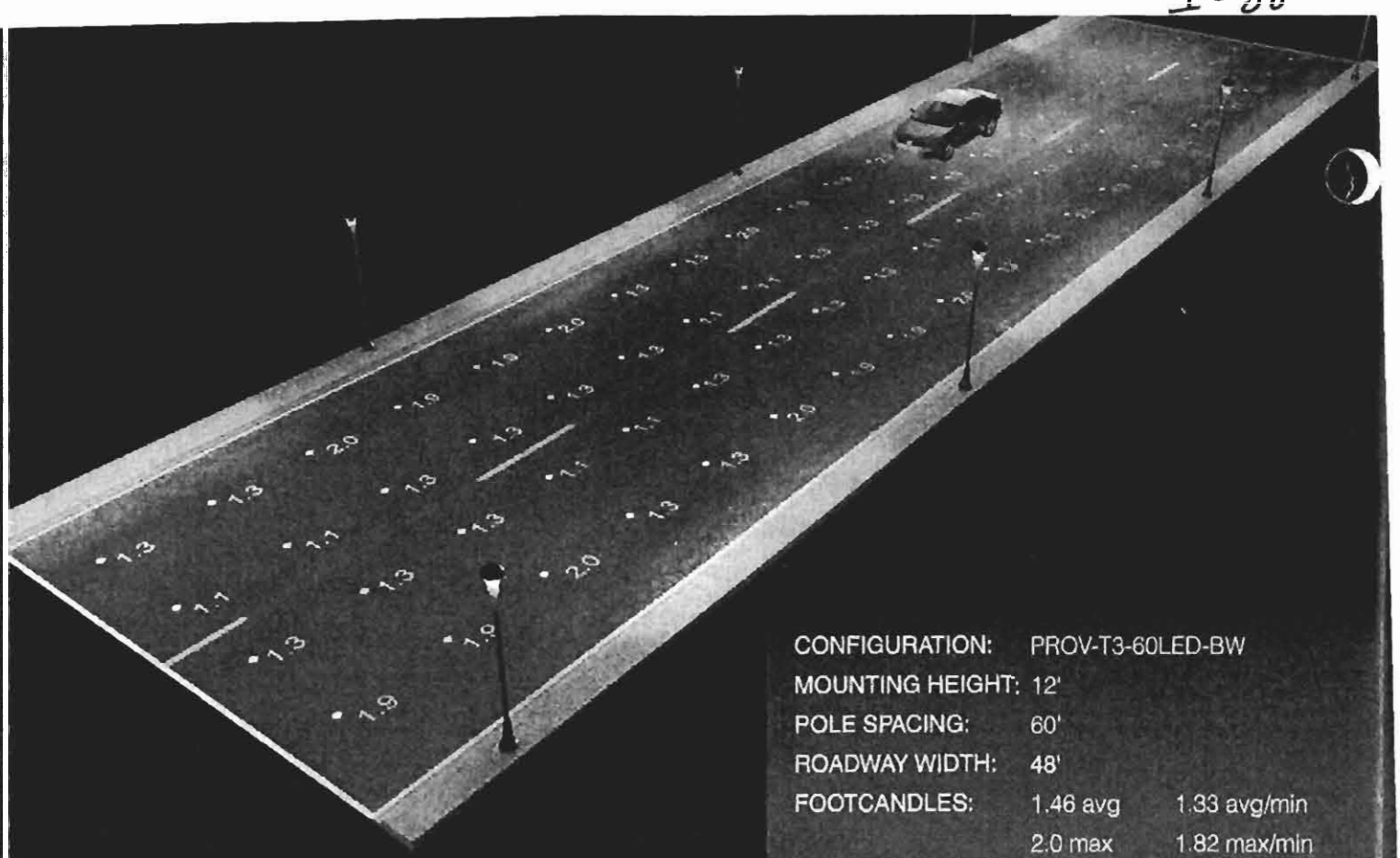
PATENTS PENDING

Illustration of a single MicroEmitter at 70° angle

Advanced Thermal Management

Each MicroEmitter incorporates a solid aluminum heat sink, which is then fastened to the EmitterDeck, a thick aluminum carrier plate designed to maximize cooling surface area. The module is then fixed to Providence's die-cast aluminum housing to effectively disperse heat away from the optical chamber.

Drivers and connections are isolated from the EmitterDeck, further improving LED and driver life with projections of at least 60,000 hours of useful life (L_{70}).



CONFIGURATION:	PROV-T3-60LED-BW	
MOUNTING HEIGHT:	12'	
POLE SPACING:	60'	
ROADWAY WIDTH:	48'	
FOOTCANDLES:	1.46 avg	1.33 avg/min
	2.0 max	1.82 max/min
	1.1 min	

Uniform Illumination

AAL's exclusive MicroEmitter control and 70°/60°/50° beam angle design limits glare, while maintaining wide pole spacing.

The result is **maximum throw** with **broad, comfortable, uniform illumination.**

MicroEmitters at 70° angle

MicroEmitters at 60° angle

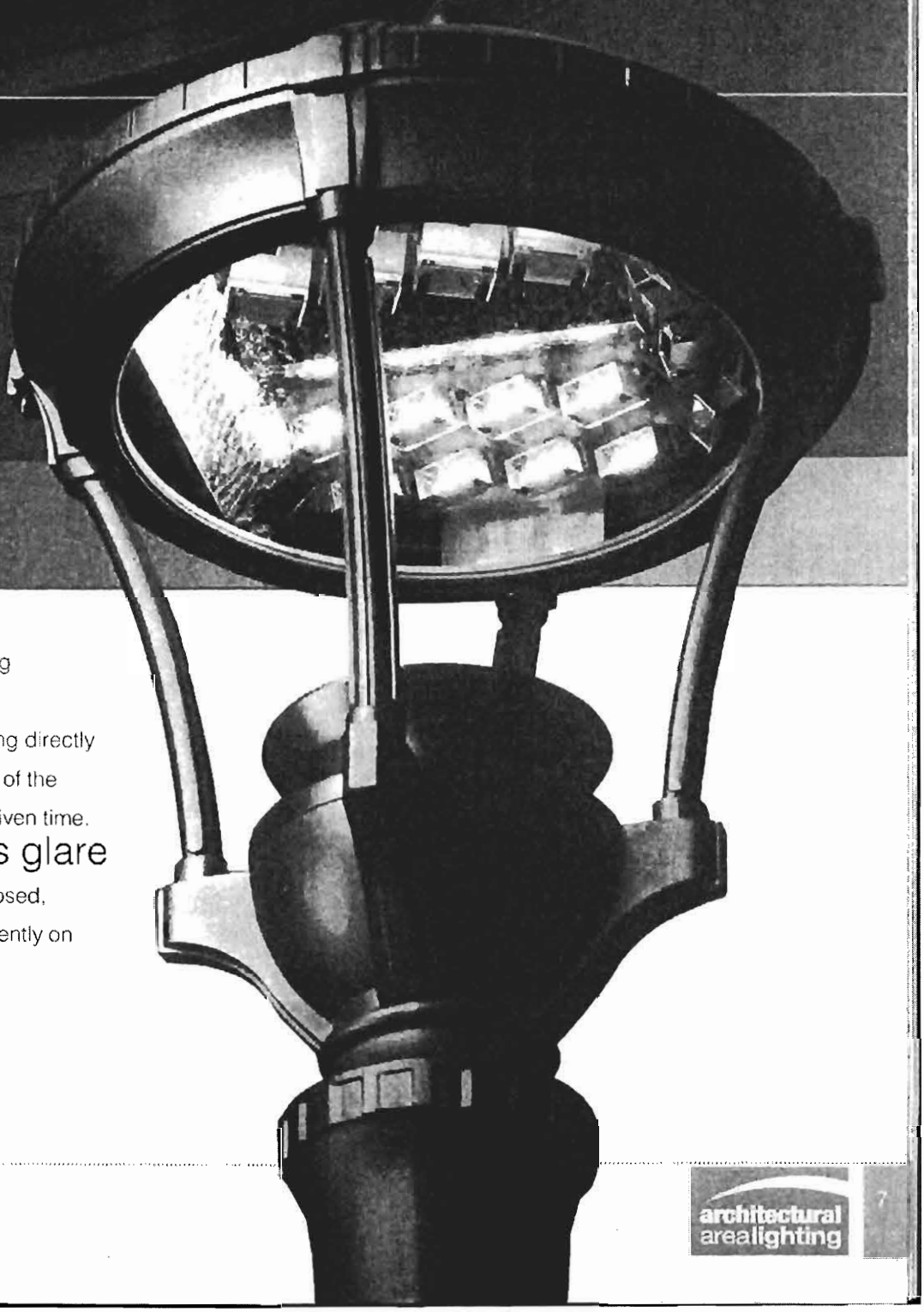
MicroEmitters at 50° angle

Center reflector evenly distributes light below luminaire

HOW IT WORKS

up to 50% LESS glare*

* Compared to exposed, unshielded LED systems.



The exclusive precision aiming system of Providence LED ensures that even when looking directly at the luminaire, only one-half of the LEDs can be viewed at any given time. This results in 50% less glare when compared to other exposed, unshielded LED systems currently on the market.

PROVIDENCE LED

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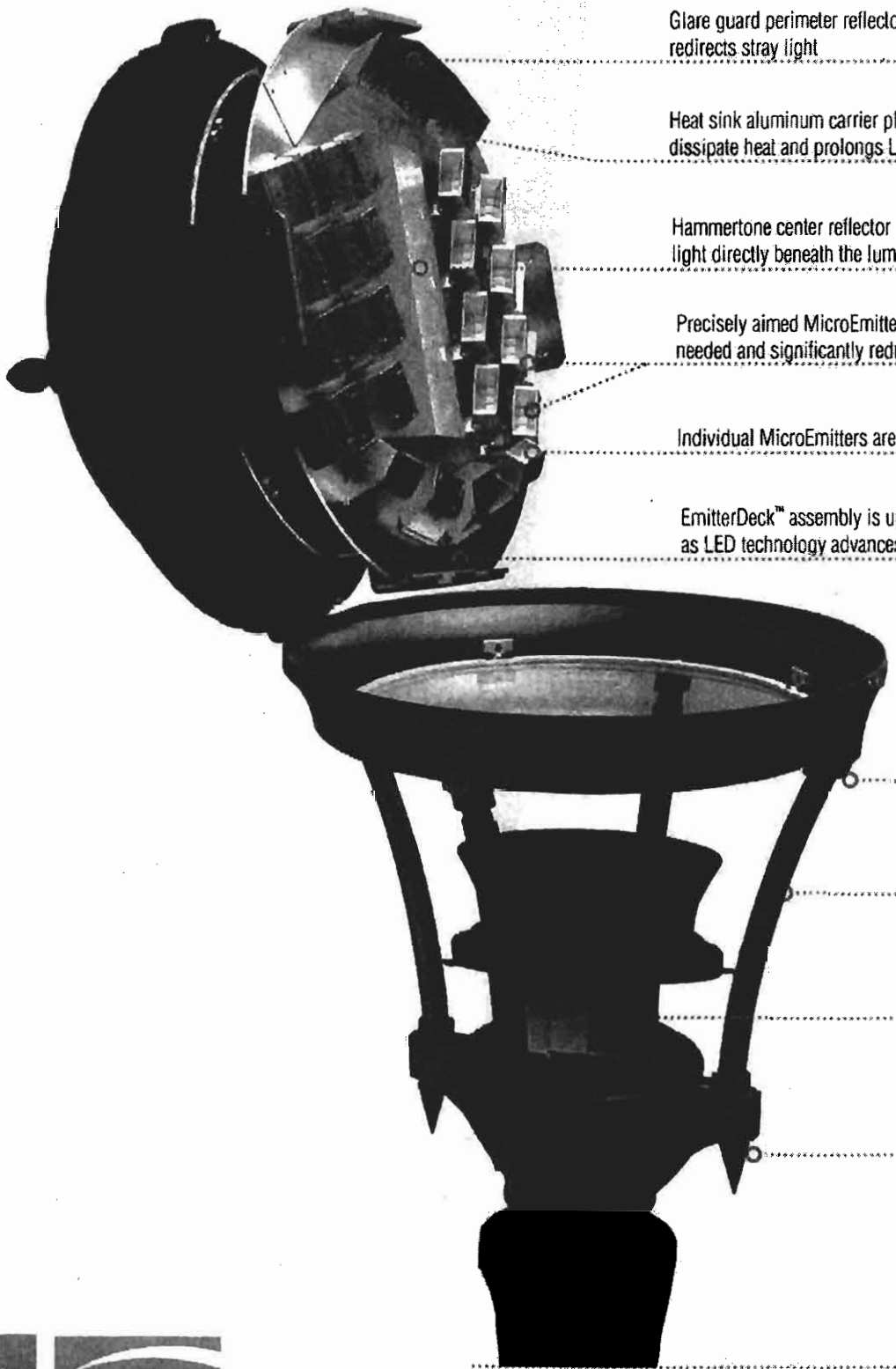
Design Excellence Providence® LED



Glare guard perimeter reflector redirects stray light

Heat sink aluminum carrier plate helps dissipate heat and prolongs LED life

Hammertone center reflector evenly distributes light directly beneath the luminaire

Precisely aimed MicroEmitters put light where it is needed and significantly reduce glare

Individual MicroEmitters are field replaceable

EmitterDeck™ assembly is upgradeable as LED technology advances

Die-cast housing for maximum durability

Decorative struts conceal wiring

Tool-less access to drivers for easy maintenance

Decorative spikes available

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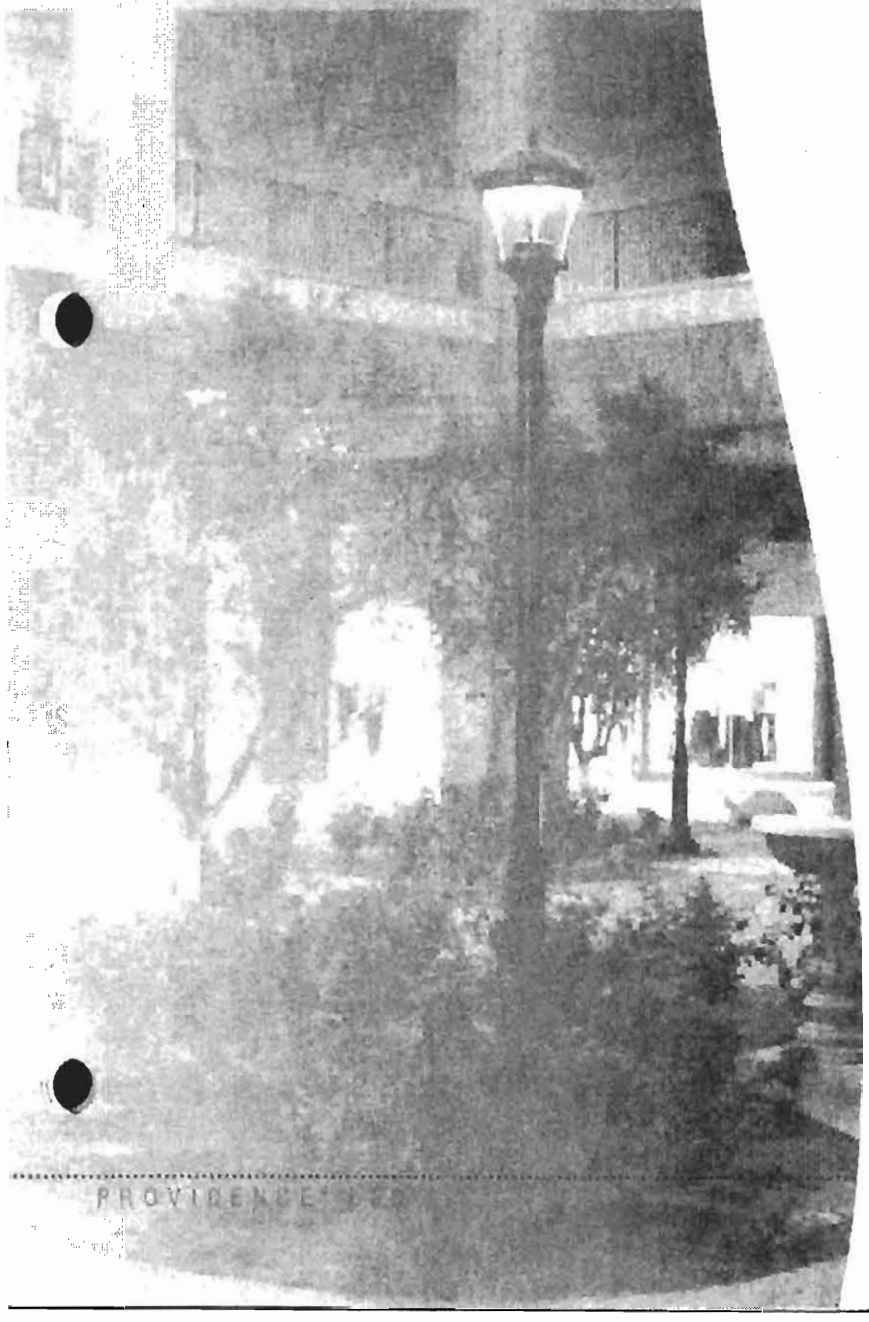
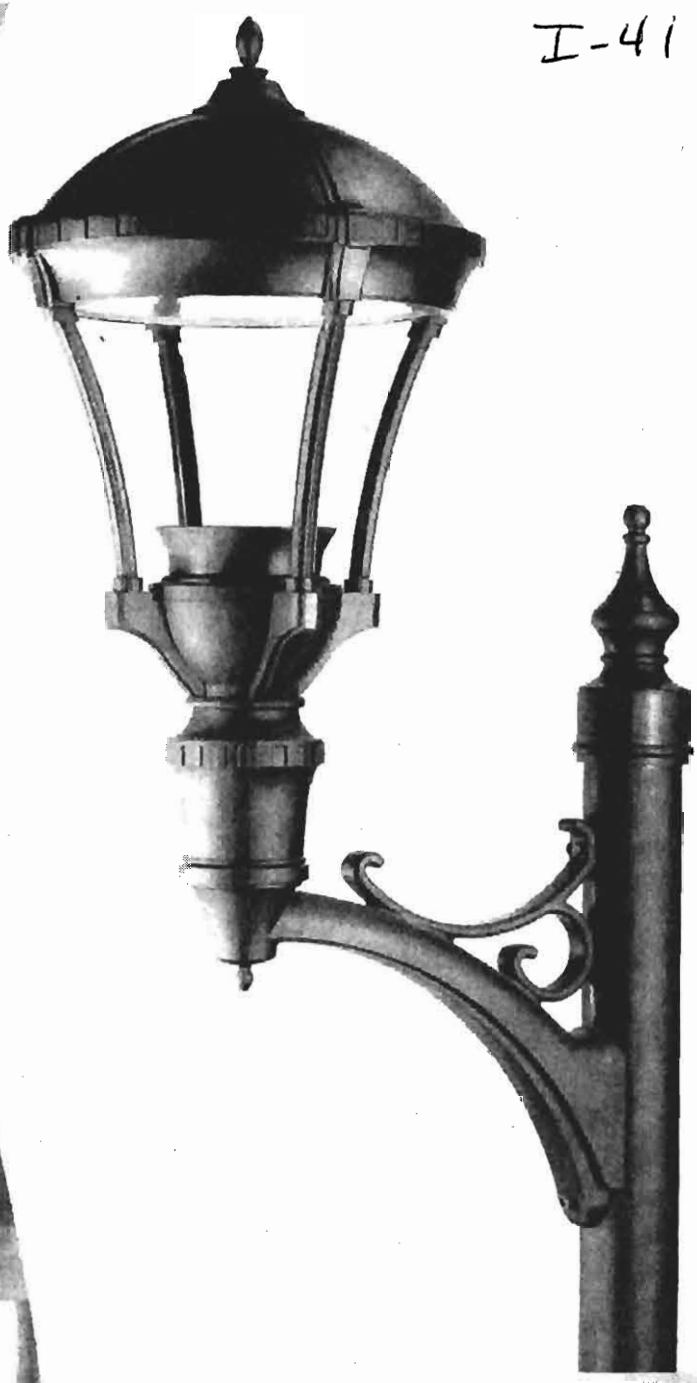
Providence LED, part of AAL's **Designer SSL Series**, is the first *truly* elegant LED luminaire on the market today. Its distinctive styling and high performance sets it apart from all others. One look is all it takes to discern that Providence is the epitome of quality and beauty.





Please visit www.aal.net for a complete listing of decorative arms.

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Providence® LED

Sustainable Lighting

energy savings

Providence LED Energy Savings Guide

Description	Total Luminaire Wattage	Energy Savings (Watt)	Energy Savings (kW)	Energy Savings per Fixture per Year (12 hours per night @ $0.10 per kWh)
PROV LED	70			
70W MH	90	20	0.020	$8.76
70W HPS	91	21	0.021	$9.20
100W MH	129	59	0.059	$25.84
100W HPS	130	60	0.06	$26.28

AAL is an industry leader in aesthetic design and optical performance, and in environmental responsibility. All AAL products are produced with sustainable technologies that have as small an impact on the environment as possible.

Some of the responsible steps that AAL has taken over the years include:

- Using recycled content whenever possible.
- Recycling practices
- Using renewable energy sources
- Water stewardship practices.

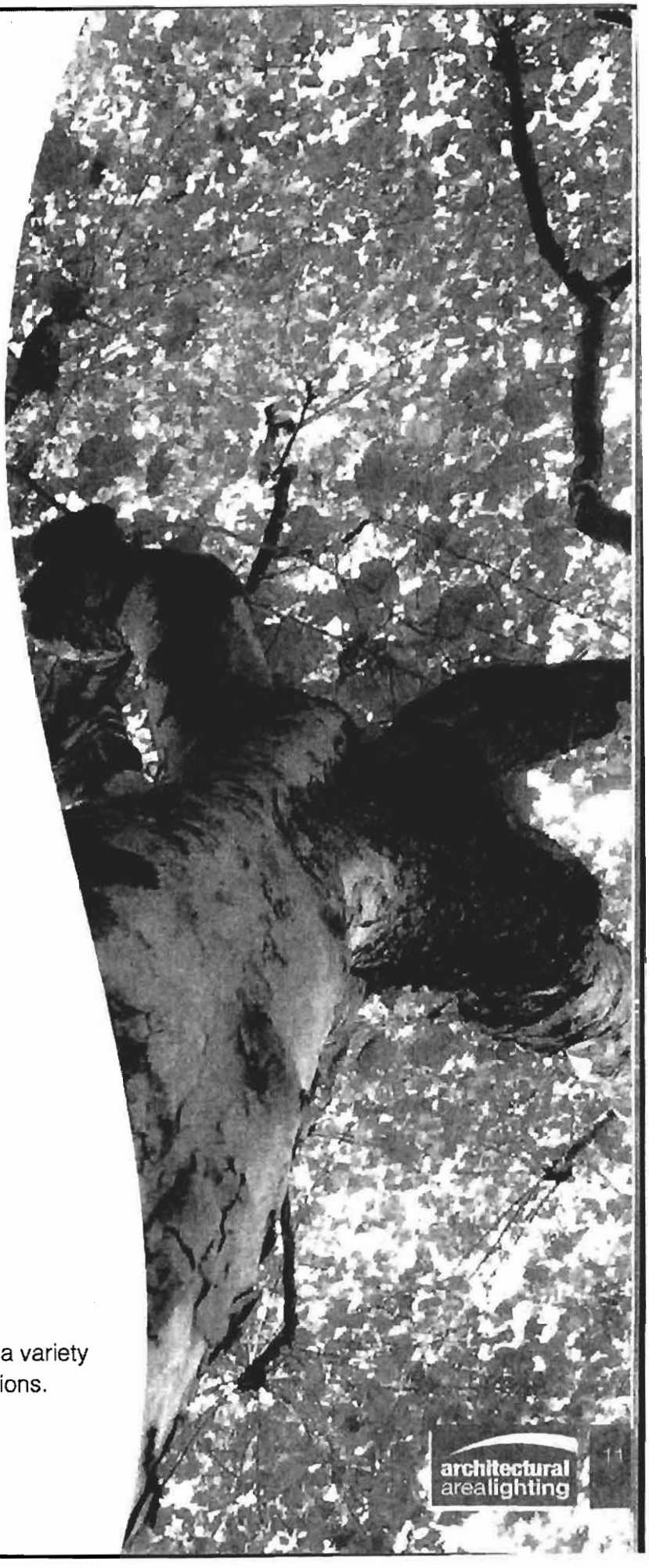
Visit www.aal.net for a completed listing of AAL's sustainable practices

Upgrade Providence LED EmitterDeck as technology advances

Sustainable **Lighting**

Energy efficient lighting solutions can help reduce lighting costs without sacrificing light levels

Efficient
Effective
Eco-friendly



ida APPROVED Dark-Sky Friendly Fixture

Providence LED offers a variety of dark sky friendly options.

PROVIDENCE LED

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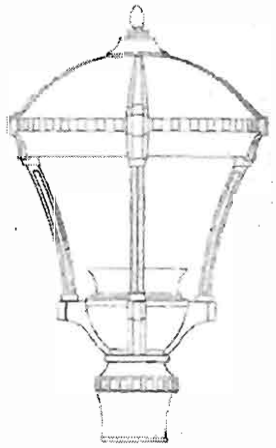
Providence® LED

with MicroEmitter Technology



Providence LED
Medium Housing Size
HT: 31.5"
DIA: 18.7"
WT: 29 lbs

How to Order

1. Select Luminaire and LED Configuration
2. Select Options
3. Select Color
4. Select Mounting

1. LUMINAIRE/LED CONFIGURATION

MEDIUM HOUSING SIZE

PROV-T2-60LED-WW
IES Type 2 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

PROV-T2-60LED-BW
IES Type 2 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

PROV-T3-60LED-WW
IES Type 3 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

PROV-T3-60LED-BW
IES Type 3 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

PROV-T4-60LED-WW
IES Type 4 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

PROV-T4-60LED-BW
IES Type 4 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

PROV-T5-60LED-WW
IES Type 5 distribution. 60 light emitting diode array (70 watts). Warm white (3500K). 120 thru 277 volt.

PROV-T5-60LED-BW
IES Type 5 distribution. 60 light emitting diode array (70 watts). Bright white (5100K). 120 thru 277 volt.

2. OPTIONS

SPK	Decorative cast aluminum spikes on the top and bottom of the four vertical struts
PFN	Cast aluminum finial painted a brass color
BPS	Cast aluminum struts painted a brass color. Spikes also painted brass if option SPK chosen.

3. COLOR

All 13 standard and 5 premium AAL colors available.
For RAL, please submit a 4-digit RAL number or color chip for custom colors.

4. MOUNTING

Select post top mount on a 4" O.D. pole or choose from a wide variety of arms. Please visit www.aal.net for the complete selection of decorative arms.

EXAMPLE

LUMINAIRE	LED CONFIGURATION	OPTIONS	COLOR	MOUNTING
PROV-T3	60LED-WW	SPK	MTB	Visit www.aal.net for mounting options

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Specifications

Family	Luminaire Code	Distribution Type	LED Configuration*	Wattage Consumption	Lumen Output	Lumens per Watt	CCT
Providence® Medium	PROV-T3	3	60LED-BW	70	2790	40	5100K
	PROV-T5	5	60LED-BW	70	2892	41	5100K

** Driven at 350mA*

HOUSING

The upper lamp housing shall be die-cast aluminum. The internal reflector module is sealed from the outer housing with a one-piece, memory retentive, molded silicone gasket. The tempered glass lens shall be sealed to the housing with a silicone gasket. One stainless steel latch shall release the door.

ELECTRICAL

120 thru 277 volt. All electrical components are mounted directly to the driver tray for maximum heat dissipation. LED constant current driver operates at 350mA.

MICROEMITTER™

Precision injection molded, highly specular reflectors are positioned to achieve directional control toward desired task for IES cutoff classification. Secondary reflectors with a concave, specular medium hammertone finish are used to redirect light downward. No fasteners are placed on the reflective surface. The entire assembly fastens to the housing as a one-piece module and features wiring quick-connects for easy installation. Standard color temperatures are 3500K and 5100K. Other temperatures available. Please contact factory. MicroEmitters are individually field replaceable.

MOUNTING

The PROV is factory supplied as a complete, pre-wired assembly. The PROV fitter shall slip over a 4"/100mm open top pole or arm and secured and leveled with 3 stainless steel set screws.

FINISH

The finish consists of a five stage pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance.

CERTIFICATION

Fixture shall be listed with ETL for outdoor, wet location use, UL1598 and Canadian CSA Std. C22.2 no.250. IP=55.

WARRANTY

Providence LED is warranted for five years including housing, LEDs, and electrical components Any unauthorized return, repair, replacement or modification of the Product(s) shall void this warranty. This warranty applies only to the use of the Product(s) as intended by AAL and does not cover poles, arms, mounting, or any misapplication or misuse of said Product(s), or installation in hazardous or corrosive environments. Contact AAL for complete warranty language, exceptions, and limitations.

5 YEAR WARRANTY

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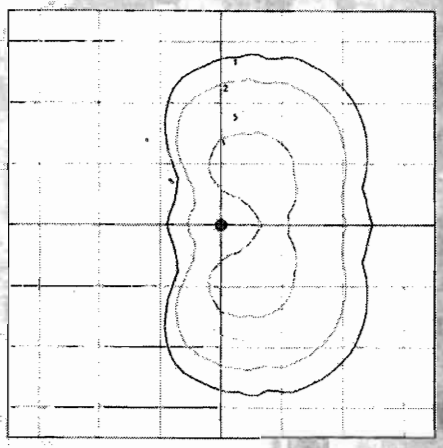
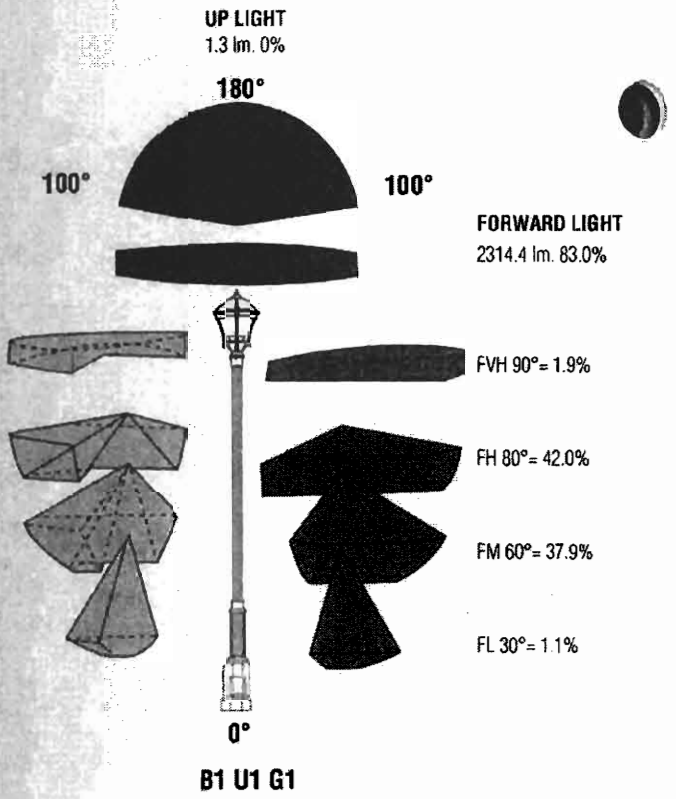
PROV T3 Type 3



Mounting Height: 12'
Total flux: 2790
Watts: 70
LPW: 40

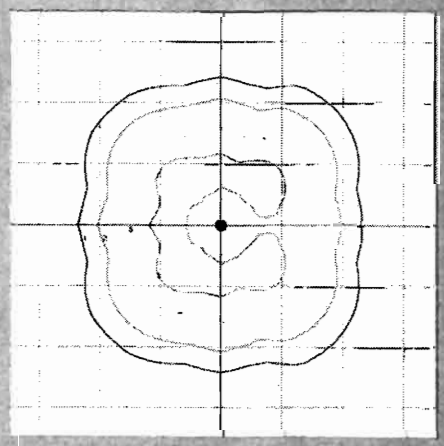


B1 U1 G1

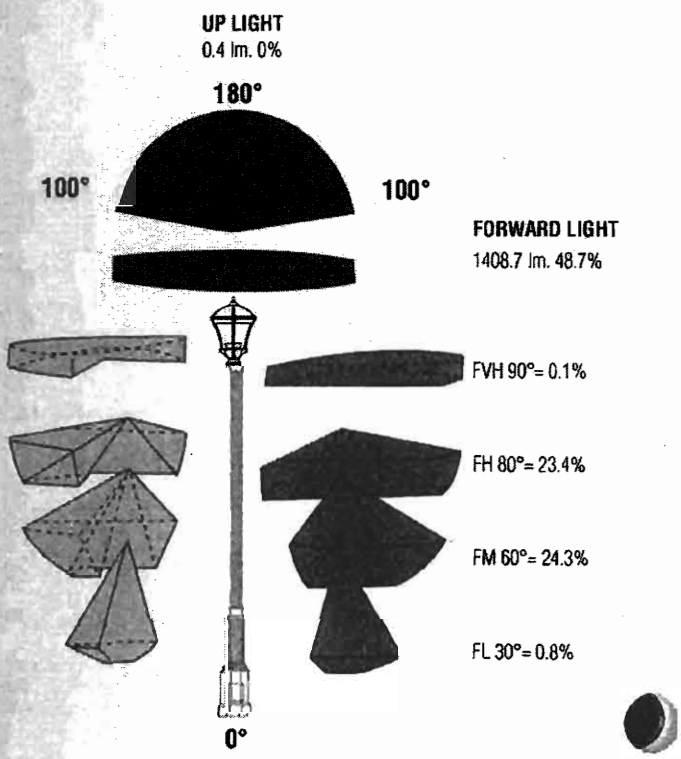
Photometry

BUG Ratings

PROV T5 Type 5



Mounting Height: 12'
Total flux: 2892
Watts: 70
LPW: 41



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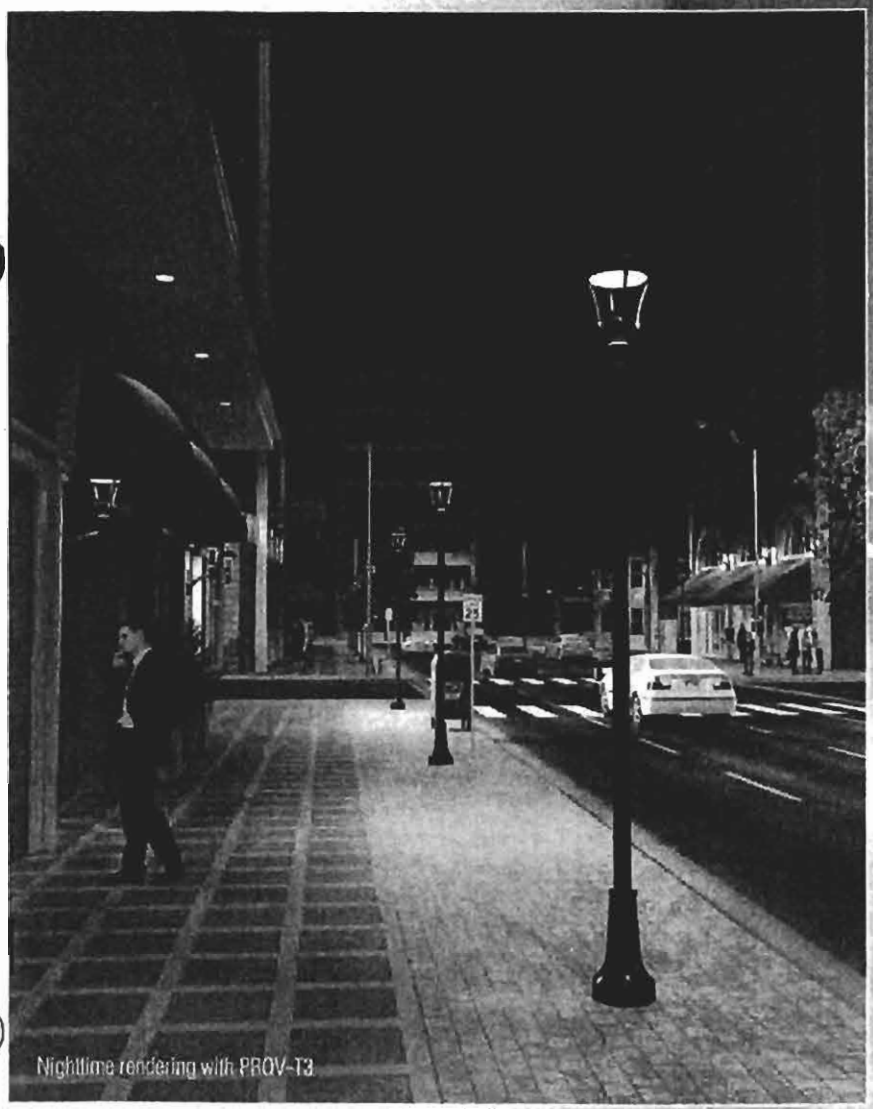
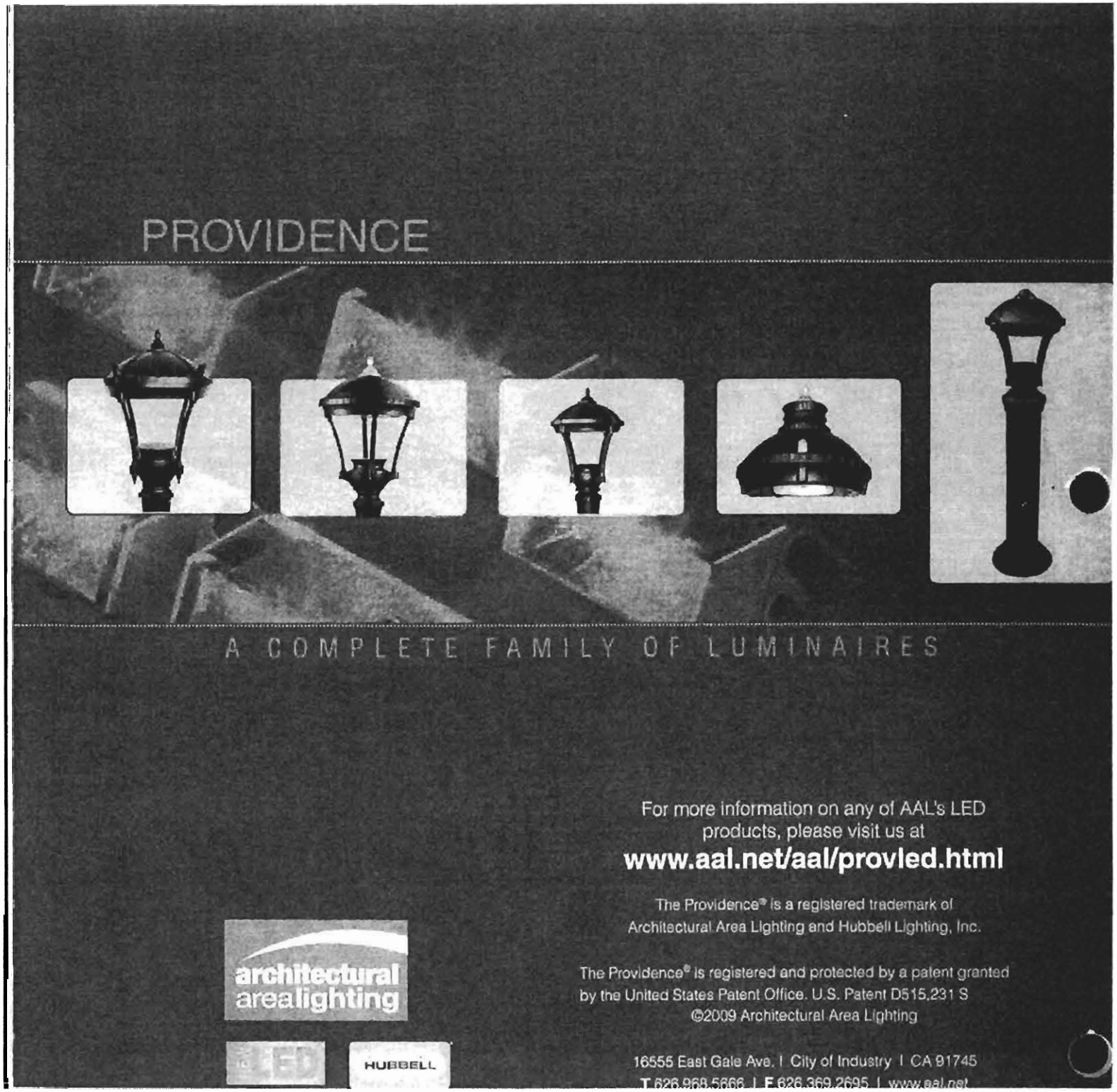
Photometric **Integrity**

All photometry tests were performed by an independent, certified photometric laboratory under strict LM-79-08 standards. AAL only uses IES-LM-80 compliant components in their LED products.



Nighttime rendering with PROV-T3

Please visit www.aal.net to learn more about BUG ratings and for a complete listing of IES reports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A COMPLETE FAMILY OF LUMINAIRES
For more information on any of AAL's LED products, please visit us at
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