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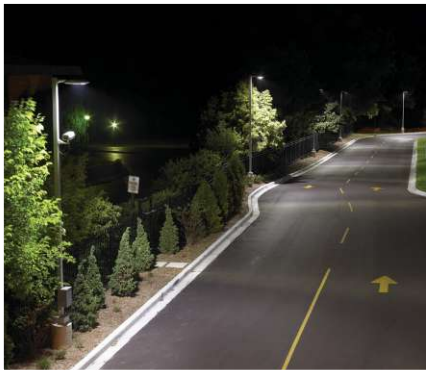

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A•L ARCHITECTURAL LIGHTING (Vol. 25, No. 2 USPS 000-846, ISSN 0894-0436) is published seven times per year (bimonthly, except monthly in May and June) by Hanley Wood, LLC, One Thomas Circle, N.W., Suite 600, Washington, DC 20005. Periodicals postage paid at Washington, DC, and additional mailing offices. Printed in the USA. Postmaster: Send changes of address to ARCHITECTURAL LIGHTING, P.O. Box 3494, Northbrook, IL 60065-9831.

Canada Post Registration #40612608/G.S.T. Number: R-120931738. Canadian return address: Pitney Bowes Inc., P.O. Box 25542, London, ON N6C 6B2.

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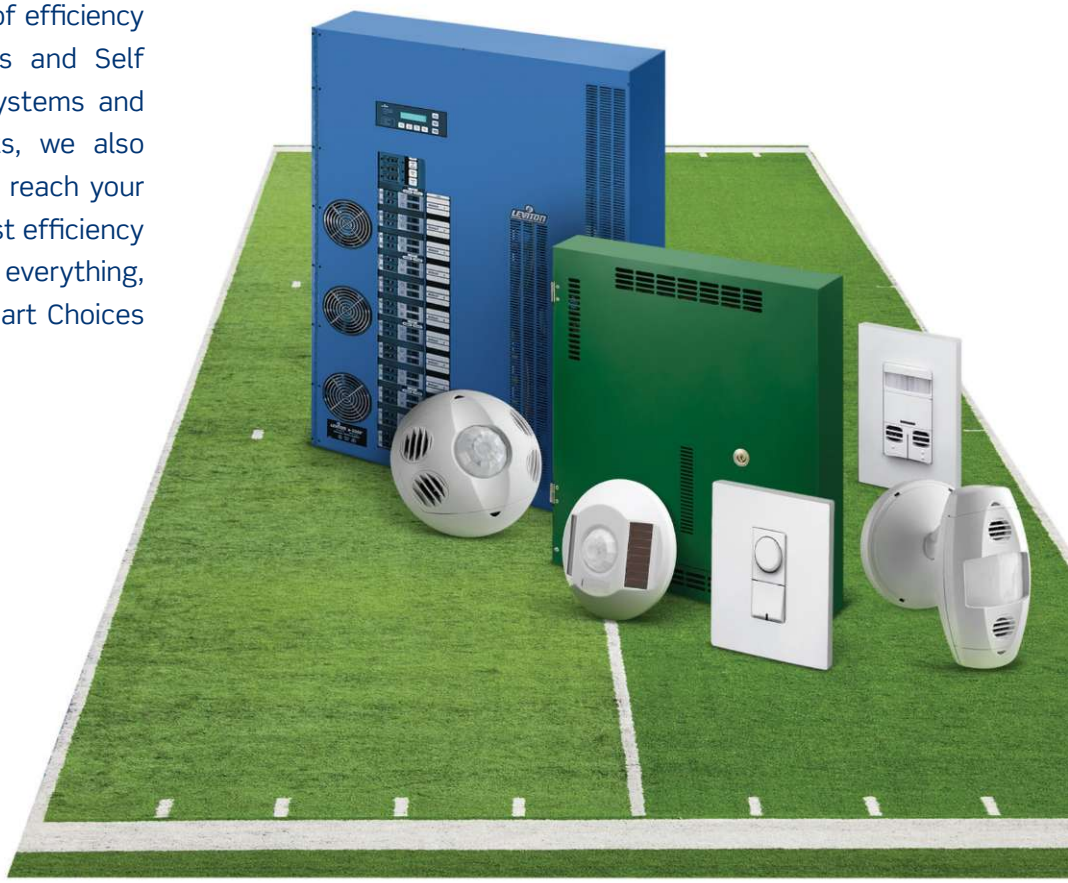

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ARCHLIGHTING.COM For expanded article content, the latest news, and calendar listings and blogs. Also, read e-notes and ARCHITECTURAL LIGHTING's new digital edition.

Online this month:
Critique "Black Hole: The Dark-Sky Lobby Wants to Make the World a Darker Place, Is that Really Such a Good Idea?" —Lighting designer Peter Maradudin offers his opinion.

Philippe Baumann (cover); Courtesy Miller Hull (left); James Provost (top right); Noah Kalina (bottom right)






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IMAGES FROM LEFT TO RIGHT : IALD EDUCATION TRUST PRESIDENT MARK ROUSH | **2010 IALD RADIANCE AWARD : SHEIKH ZAYED BIN SULTAN AL NAHYAN MOSQUE, EXTERIOR LIGHTING**, ABU DHABI, UAE, LIGHTING DESIGN BY SPEIRS & MAJOR ASSOCIATES, PHOTOGRAPHY © ALAN TOFT | IALD AWARDS CHAIR DIANE MCNABB RODRIGUEZ, ASSOC. IALD [LEFT] AND IALD PRESIDENT KATHERINE C. ABERNATHY, IALD [RIGHT]. | **2010 IALD INTERNATIONAL LIGHTING DESIGN AWARDS, AWARD OF EXCELLENCE : FIRST NATIONAL BANK METRO CROSSING - GLASS FEATURE WALL**, COUNCIL BLUFFS, IA USA, LIGHTING DESIGN, RDG PLANNING & DESIGN, PHOTOGRAPHY © TOM KESSLER, TOM KESSLER PHOTOGRAPHY | KATHERINE C. ABERNATHY, IALD [FAR LEFT], AND DIANE MCNABB RODRIGUEZ [FAR RIGHT], PRESENT THE 2010 IALD RADIANCE AWARD TO JONATHAN SPEIRS OF SPEIRS AND MAJOR ASSOCIATES. | **2010 IALD INTERNATIONAL LIGHTING DESIGN AWARDS, AWARD OF EXCELLENCE : UTAH STATE CAPITOL RESTORATION**, SALT LAKE CITY, UT US, LIGHTING DESIGN, RANDY BURKETT LIGHTING DESIGN INC, PHOTOGRAPHY © MICHAEL A. DUNN, DUNN COMMUNICATIONS

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"I often think of my role as editor as that of an advance scout, the person out in the field looking for the latest news, the best examples of work, and the people making the greatest impact on the industry."

THE EDITORIAL "DESIGN" PROCESS

I'm often asked how an issue of ARCHITECTURAL LIGHTING comes together, how we choose the people, projects, and products that appear on our pages. Being in the middle of the process, I sometimes forget that what seems readily apparent to me is not necessarily the case with readers. So I thought this would be a good opportunity to provide you with a glimpse into my editorial "design" process.

Each issue of ARCHITECTURAL LIGHTING is very much a design project for me; chalk that up to my architectural background, I suppose. Ideas for an issue take form months, sometimes years, in advance. That was the case with this issue's theme—landscapes and borders—and the land port of entry (LPOE) feature (page 36), which I first started thinking about in 2007 when the Massena, N.Y., LPOE signage issues were discussed in *The New York Times*. On other occasions, an idea for a story is spontaneous or "of-the-moment" when an important issue might suddenly arise. But no matter the time frame, it is my job as editor to coordinate all these threads of information into a cohesive package.

Our editorial calendar serves as a framework so that we can deliver an integrated coverage of projects and issues important to technology and the industry. The topics that make it onto the calendar are culled from project and product releases that we receive; our own project scouting; discussions with my editorial and art colleagues here at AL and with our sister publications ARCHITECT, ECO-STRUCTURE, and PRO AV; and, most importantly, the conversations I have with readers across the lighting industry. Staying attuned to the issues that are of concern is a huge responsibility, and one that I take very seriously. There is a lot of behind-the-scenes legwork to gather information and listen to multiple opinions in order to properly assess the topics covered and how best to present them. We are always trying to look at topics from a new perspective, to find the part of the story that has not yet been told.

Integration is key. It is something we have always incorporated into our editorial coverage and it is a cornerstone of the magazine's redesign for our 25th anniversary. Mindful that people receive information in different ways, we are continuing to build on our core original content to bring you related resources online. That might take the form of a video, a book or a product review, or a blog post. The new structure of our editorial coverage is set up to take advantage of this layered approach. Whether you spend one minute or one hour with AL, in print or electronic form, you will take away something valuable.

Ultimately, I'm interested in ideas and finding ways to connect lighting to the larger world of architecture and design. It gives us the ability to look at lighting from different angles—cultural, social, political, and economic. So I often think of my role as editor as that of an advance scout, the person out in the field looking for the latest news, the best examples of work, and the people making the greatest impact on the industry. The goal is to keep you inspired and informed.

Elizabeth Donoff
Editor

Corrections and Omissions
A redesign is a huge undertaking, and no matter how long you plan in advance, sometimes information is accidentally overlooked. We regret that the following items were missed in the January/February 2011 issue:

Photo credits:
Art of the Americas Wing, Museum of Fine Arts Boston: Chuck Choi, p. 44, p. 46 (top); p. 48, MFA p. 49 (top and bottom); Foster + Partners, p. 46 (bottom).

Project Credits:
RTLD Lighting Design in Tel Aviv, Israel, worked in concert with Tillotson Design Associates for the lighting in the public areas and gardens, with BDP Lighting in the Archeology Wing, and oversaw all lighting for the art exhibit areas.

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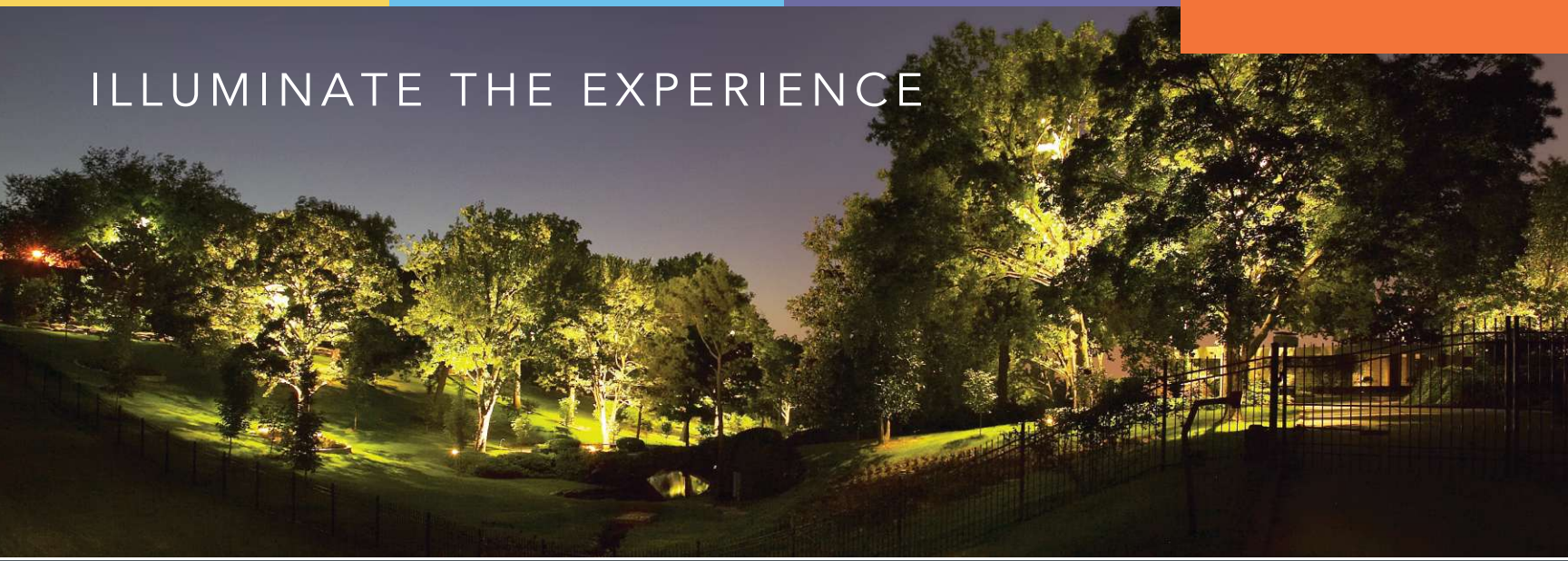

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• BRIEFS

LOUIS POULSEN RECEIVES AIA COLLABORATIVE ACHIEVEMENT AWARD

The award is the first time a lighting company has received this honor.

text by Rebecca Ebstein
edited by Elizabeth Donoff

Danish architect Poul Henningsen's iconic PH Artichoke luminaire, designed in 1958, adds a sophisticated and contemporary design no matter the installation setting (above).

"Over about a century, Louis Poulsen has evolved into a design firm with the talent to rival Apple, but with roots deep in Danish culture and ethics. At Poulsen, the culture of the firm has always been overwhelmingly about design. ... This ethos permeates everything they do."

— Buzz Yudell, founding partner Moore Rubell Yudell

The American Institute of Architects (AIA) has selected five recipients for its Institute Honors for Collaborative Achievement, the highest form of recognition bestowed by the institute on allied professionals and organizations who work in the field of architecture. This year's recipients are the Active Design Guidelines, a multiagency, interdisciplinary collaboration with the New York City Dept. of Design and Construction; the Dallas Architecture Forum, a nonprofit civic organization; landscape architect Peter Lindsay Schaudt; professor and landscape architect Walter J. Hood Jr.; and lighting manufacturer Louis Poulsen Lighting. This is the first time in the award program's history that a lighting company has been recognized.

Louis Poulsen Lighting was founded in 1874 in Copenhagen as an electrical company. In the 1920s, however, when the company began to work with Danish architect Poul Henningsen, it began its shift to design. In a prepared statement, Kent Stilling Pedersen, president and CEO of the company said, "Since the company was founded over 100 years ago, we have believed that beautiful and functional lighting fixtures cannot be designed in a vacuum without the input of the people who actually design buildings. To receive such a prestigious accolade for collaboration is a great and very proud moment in Louis Poulsen history and it validates our company's mission."

Some of the most iconic light fixtures belong to the Louis Poulsen portfolio of luminaires, including the PH Artichoke. Designed by Henningsen in 1958, the pendant fixture is known for its overlapping leaves—72 in total—that shield the lamp source and that redirect and reflect the light.

Another of the company's other notable luminaire designs include architect Arne Jacobsen's AJ Table Lamp, with its distinct asymmetrical lamp hood, originally designed in 1960 for the SAS Royal Hotel in Copenhagen. The company has continued its tradition of collaboration and design and technical excellence with a new generation of talent, such as Danish designer Louise Campbell.

John Small, head of product design at the internationally recognized architecture firm Foster + Partners, wrote in support of Louis Poulsen's nomination, "I cannot imagine a more fruitful partnership between ourselves as architects and a design/manufacturing firm that contributes an essential design element to light itself." The Collaborative Achievement Awards will be presented at the 2011 AIA National Convention and Design Exposition in New Orleans, May 12–14. •

High Performance Landscape Guidelines: 21st Century Parks for NYC
This new reference guide, created by the New York City Department of Parks & Recreation, in partnership with the nonprofit Design Trust for Public Space, presents an overview of leading design strategies, with a nod to lighting, for the way New York City outdoor space is designed, constructed, and maintained. The goal is to "green" the city's 29,000 acres of parkland by cleaning water and air, increasing biodiversity, lessening the burden on sewer systems, reducing the urban-heat-island effect, improving public health, and reducing energy consumption. The guidelines can be downloaded at nyc.gov/parks/landscapeguidelines.

- **Navigate Your Luminous City, nightseeing.net**
  This program, created by lighting designer Leni Schwendinger, seeks to raise awareness about light and shadow in urban nighttime environments and provides an overview of public lighting theory to general audiences and design professionals alike.

Courtesy Targetti Poulsen USA (left); Realities:United, Studio for Art and Architecture (right)

Kunsthaus Graz To see the latest image sequence playing on the BIX light and media façade installation, check out the live webcam link at bixcam.kunsthausgraz.at. Additional images and project information are also available at realities-united.de/#PROJECT,69,1.

BIX LIGHT AND MEDIA FAÇADE ADDED TO MOMA'S PERMANENT COLLECTION

Realities:United's prototype for the light fixture design for the Kunsthaus media façade in Graz, Austria, is recognized as a reference standard.

text by Rebecca Ebstein

The BIX light and media installation, designed for the façade of the Kunsthaus in Graz, Austria, by Jan and Tim Edler of the Berlin-based design studio Realities:United, has received a significant honor—a place in the Museum of Modern Art's (MoMA) permanent Architecture and Design Collection. An early prototype at 1:1 scale of the light fixture will be displayed, which represents a single "pixel" on the Kunsthaus' media façade. Inclusion in the collection recognizes BIX's relevancy as one of the first integrations of architecture, media, and art.

The original installation, completed in 2003 (see ARCHITECTURAL LIGHTING, April/May 2004, pages 20–21) is composed of 930 light fixtures in 900 square meters of the façade, each fashioned from a 40W circular fluorescent tube secured behind translucent blue plexiglass panels. Each lamp is connected to a digital control system and individually controlled. The result is a communicative skin that displays programmed projections, animations, or messages at a speed of 18 frames per second as the graphics move across the façade.

BIX has received a number of awards and its illumination achievements have become the standard reference for media architecture concepts. In a press release, Jan and Tim Edler said, "We always regarded this work as an artist laboratory, i.e., one freed of commercial constraints, for researching suitable behaviors for an increasingly dynamizing architecture. In our view, BIX is more a process for developing a language than an artistic end product." •

One of Abe Feder's most significant projects was the lighting of the lobby murals at Rockefeller Center in New York. Fixtures were painted to blend into the walls and to illuminate the 1930s artwork, "New Frontiers," by José María Sert and Frank Brangwyn.

REALITY & THE ART OF REVEALMENT

From the Archive presents articles from the post 25 years, with new commentary from members of the lighting community.

original text by Abe Feder, FIES, FIALD
commentary by William B. Warfel, IES, IALD

At the moment, the economics of the country is at a low point and few new buildings are being constructed. Some parts of the country are overbuilt and existing structures are standing empty. The architectural world is in disarray. For thousands of architectural designers, there is no work.

Many large architecture firms—solid ones that had 300 or 400 employees—still have work, but have shrunk to a staff of 100. Architects and designers are functioning in retrofitting departments stores, hotels, and offices in existing buildings. However, the adventures of new buildings, new directions in architecture, may not be forthcoming in the near future.

The concept of artistry in lighting design appears consistently in magazines, but the reality of it is: You have to have a client.

When I was in Wichita, Kan., last year [1993], speaking before graduate theatrical lighting designers at the United States Institute for Theatre Technology (USITT) Conference, I was flabbergasted that colleges were turning out so many in the field. The question that came to mind was: Where are they going to work?

The "purity" of the teaching factor at the college level that turns out architects and designers can result in the teaching of wishful dreams, in abstract designs. Some of these teachers have never had to sell anything, they have never had to practice the profession and function in the reality of the workforce. Yet the students need to learn the basics and to have the training. However, the schools teach the nonobjectivity—the pureness of art. The real question is: How do you get clients and keep them?

When these graduates work for someone

Lee W. Nelson

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WARFEL'S THOUGHTS:

If you are a reader who knew Abe Feder, you can only smile while reading his piece from 1994. If you never had a chance to meet him, you missed out on a real treat, because Abe was an original, and above all things, he championed the cause of "reality," just as he says in the title.

What did he mean by that? One reality in 1994 was an economy in shambles, with major architectural firms reduced to a shadow of their former selves, with design graduates finding no place to work and with buildings not being built. He could have written this last week! He never missed a chance to beat his favorite drums, and before he gets to his own philosophy, Abe devotes considerable time to a favorite reality crusade: the abstract (as he calls it) nature of training in architecture (and theater, one assumes). Artistry in design is all well and good, but lighting design is a business, and the reality is that to survive in it one needs to be a real-world business person. All of us who design for a living might well agree with him, at least with the fact that a design practice is a business. In tough times, this is one reality we all have to grasp.

Abe saves some of his best language for his discussion of the reality of light sources, including a characterization of the "light bulb" as an "ogre," looming behind us and crippling our best efforts to "reveal." By 1994, we had some compact fluorescent and high-intensity discharge lamps, and the threat of a ban on at least some incandescent lamps (remember the R40?) was in the air. Abe was suggesting that we might be designing lighting that would be impossible to maintain in the not-too-distant future because the lamp at the heart of the system might vanish. Very real today in the age of the ban on incandescent lamps. One wonders what Abe might have done with the LED.

By the time he wrote this article, Abe had had a long and very fruitful career in both theater and architectural lighting, remarkable because he saw no need to stop practicing either one in order to focus on the other. This is clear when he describes his lighting philosophy as "revealment." He writes that the mission of lighting is to reveal the original intent of the designer: "be it an architect, a playwright, a sculptor or retailer." Lighting design for Abe in 1994, as it still is for many of us in 2011, means getting past flights of fancy and dealing with the task at hand with real-world tools. Revealing with light is equally valid on stage or along the street. That was true then and it is still true today.

William B. Warfel has been an architectural and entertainment lighting designer and equipment developer since 1962, continuing today as William B. Warfel Lighting and Theater Design with his work for the Yale Opera. He has consulted on more than 60 theater projects internationally, and taught and lectured widely.

else for a time, that's easy, but when they start to feel strong enough to try it on their own, that's more difficult. They face hard realities in judgment. How much is the fee? Will it cover your overhead and still allow you a profit? Because you must address the continuous mechanics of running a business.

Then they begin to think realistically as well as artistically, "This is what I'd like to design—but this is in the realm of the possible."

The irony of it is, who says the clients are profound enough to pick the great creative minds to design their project? Sometimes they are not. It's always catch as catch can. Talent alone is not a guarantee.

And who is the ogre in the lighting world that stands behind one's back always ready to impose demands on creative designs? It is the light bulb, with its maintenance, its life span, and its color. But if you're breaking ground and inventing new lamps for new applications, the light bulb becomes an omnipresent factor. If your jobs aren't large enough, one day the manufacturer may become an "invisible" bulb company—go out of business—[and] then you're out of luck, because you've used those particular bulbs and that's a very big reality.

One of the confusions in lighting today involves the question of responsibility. Designers may create something that's wonderful and that works—yet six months later,

does the same designer take responsibility for that wonderful design continuing to function?

In my early career, the jobs were very few, and the client's expectations extended beyond the installation phase. I could get called up by the client six months after a project had been completed, and be taken to task if the design faltered because of the equipment I had specified. Today, a designer might say, "But it's not my fault."

However, it is your fault, because a bulb is not a piece of steel. It's not a door, it's not a chair—it's expendable and it's limited, and did you allow them a substitute for what you had planned? That's a reality. The creation of the design is not enough. You have to deal with the reality of its life expectancy. It's something the inexperienced don't know.

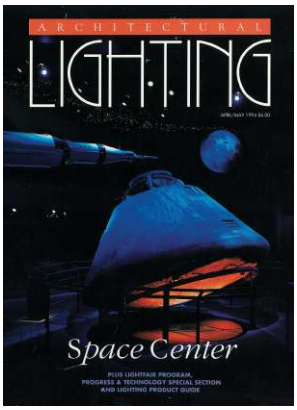
It also happens that clients will say, "Well, that's a beautiful lighting design, but what can we fall back on—I don't want to spend that much." And you have no choice but to cut—they are the clients and it's their money. So the idea of measuring up to design perfection is nonsense. Sometimes you are cursed by realities and there's nothing you can do about it. So when projects are completed, they may have a certain mundane quality and one wonders, "Why did they do something like that?" The reality is: Who said "no" and who got tired?

Essentially, my philosophy of light is revealment, and lighting design is the art of that revealment. The tools to light exist. Whatever is to be illuminated is there. I think it is the job of the lighting designer to reveal with light the design intent of the original creator, whether it be an architect, a playwright, a sculptor, or retailer. Some lighting designers have given lighting design a major omnipotence in itself and they are wrong. There is enough in the lighting field and all that's involved to maintain stewardship over creative design without trying to make it something it's not.

So at this point we're back to the light source that makes it possible. And the gods are kind. We're living in an era where light is the one of the few sciences for which we don't know all the answers. Look at what's happened with computers. We're underwater, we're in the air. Man has conquered these factors, but has yet to conquer light. The unknown still remains to be found out decades into the future. •

Abe Feder, FIES, FIALD, (1910–1997) was the first independent lighting designer in both theater and architecture. His firm, Lighting By Feder, was located in New York City, and his Broadway credits included My Fair Lady *and* Camelot. *He was responsible for many lamp and fixture developments that are now standards, and he was the first president of the International Association of Lighting Designers.*

This article originally appeared in a special section titled Progress & Technology in the Apr/May 1994 issue.



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A secondary glass façade provides sun shading and softens visual boundaries.

text by Jennifer Bickford
photo by Timothy Hursley

Located in a suburb of Houston sits a commanding eight-story General Services Administration (GSA) office building conceived by a joint venture of the architecture firms Leo A Daly/LAN and PageSoutherlandPage. It was designed under the GSA's Design Excellence Program, which was instituted to attract talented architects and engineers to federal workspaces. This new 275,000-square-foot building incorporates security criteria and sustainability strategies into a singular building vision.

In aiming for LEED certification (which it has received), the design goals were to reduce energy costs, bring daylight into the interior, and provide views. To increase the penetration of natural light, the architects oriented the long, narrow building on an east-west axis, so that the longer elevations face to the north and south. This alignment allows daylight to reach the greatest percent of the building's interior.

The exterior walls are constructed out of poured-in-place reinforced concrete to meet security criteria, and the concrete doubles as a support system for a glass curtainwall. Conceived primarily to shade the sun, this outer membrane wraps the east, south, and west

For the design of an eight-story General Services Administration office building just outside of Houston, the architects devised a double-wall system: exterior concrete walls with a curtainwall overlay with fritted glass panels that shield the building from the Texas sun.

"To have a full [exterior] view with a halo of green around [the window] gives a nice graduation of light from inside to outside."
— Lawrence Speck, FAIA, of PageSoutherlandPage

sides of the building and is made up of fritted glass panels that are offset from the concrete structure. To take full advantage of natural light, the north side is left bare.

The glass panels are spaced 1 inch apart and are attached with stainless steel clips to a metal frame that is secured to the concrete shell. Windows that are almost 9 feet tall are matched by openings in the glass skin, which are slightly smaller than the window dimensions to provide shading. The architects analyzed the sun angles so they could properly size the apertures and optimize the distance between the two skins. And in order to work as a screen, the glass panels were chosen to minimize transparency. Because the architects wanted the building exterior to blend with the lush suburban Houston landscape, a custom, green negative-dot ceramic frit was designed for the clear glass, making it almost opaque.

The quality of the interior light was extremely important to lead designer Lawrence Speck, a principal at PageSoutherlandPage. Speck's intention was to modulate the light to address the conditions in southern Texas, where the sun can be so bright that all one sees is glare. "To have a full [exterior] view with a halo of green around [the window] gives a nice graduation of light from inside to outside," he says.

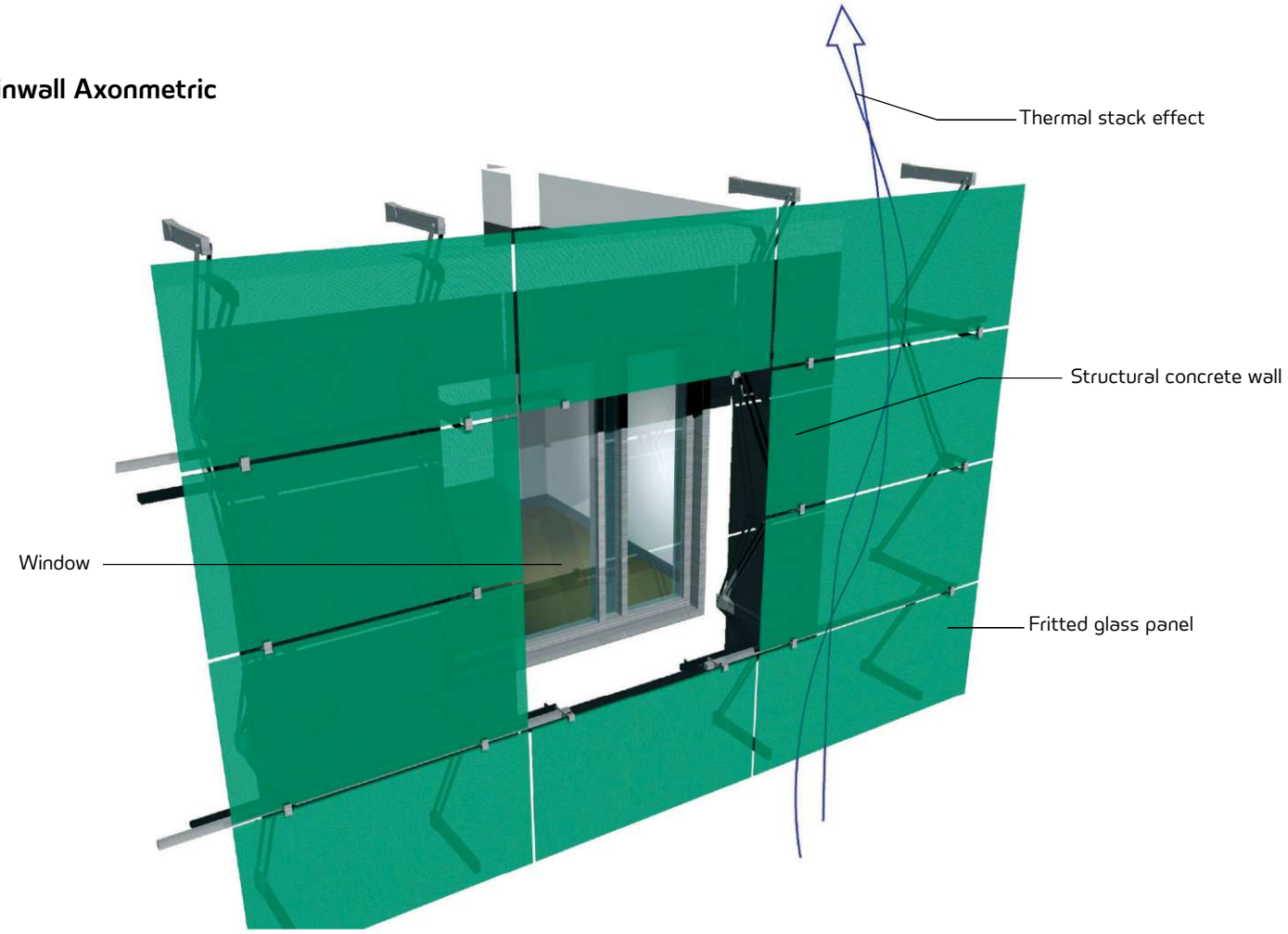
One of the main challenges, Speck explains, was how to lower the building's heat gain while still allowing in daylight. To help insulate the building from the sun and its heat, reflective aluminum shingles were applied to the exterior. The fritted-glass façade also serves as an insulating layer, and the gap between the glass and the aluminum skin creates a thermal stack effect, cooling the air temperature inside the building by 10 to 15 degrees Fahrenheit. A 30- to 50-percent energy savings is estimated by using a dual exoskeleton: It assists in moderating interior temperatures, thus reducing the building's total air-conditioning load.

Another benefit of the double façade is the play of light created by the green fritted glass and the aluminum cladding. Speck notes that it looks as though the structure "glows from inside" as the afternoon light dances across it.

Sustainable design concepts extend throughout the building site and landscape, and the orientation of the buildings allowed for the preservation of several stands of existing trees. Combined with additional landscaping, these trees provide for pleasant views from the inside and shading on the outside. Site topography, landscaping, and entrances and exits were all designed to decrease runoff and to meet the GSA's stringent security requirements.

The result of all this design and testing is a field office that successfully transitions the vertical boundary between interior and exterior. •

Curtainwall Axonmetric



Drawing courtesy PageSoutherlandPage

Details

Project: General Services Administration Regional Field Office, Houston, Texas
Client: U.S. General Services Administration, Fort Worth, Texas
Architects: Leo A Daly/LAN+PageSoutherlandPage, A Joint Venture, Houston, Texas
Lighting Designer: Lesco Architectural Lighting, Houston, Texas
Project Size: 275,000 square feet
Energy code compliance: ASHRAE 90.1-2001 per LEED 2.1 requirement
Watts Per Square Foot: a little less than 1

Manufacturers

Curtainwall: Accura (windows); Berger Iron Works (metal frame supplier—exoskeleton); Haley-Greer (hardware supplier of stainless steel clips, also the glazing contractor); Viracon (fritted, laminated glass); USM (aluminum shingles)

Lighting: Bega, C.W. Cole & Co., Cooper Fail-safe, Dasal Industries, Designplan Lighting, Federal Signal Corp., Finelite, Focal Point, Gotham, Insite Lighting, Leucos, Lithonia Lighting, Osram Sylvania, Peerless Lighting, Philips, Philips Bodine, Philips Day-Brite, Philips Gardco, The Lighting Quotient, Thomas Lighting, Tre Ci Luce, Vision 3 Lighting, Zumtobel

REPORT

THE MODEL LIGHTING ORDINANCE JOURNEY 2004–2011

Nancy Clanton, chair of the Model Lighting Ordinance Joint Task Force, discusses the intricacies involved in drafting an outdoor-lighting guideline document.

text by Nancy Clanton
illustration by James Provost

In 2004, the International Dark-Sky Association (IDA) and the Illuminating Engineering Society (IES) were each developing their own model lighting ordinance. The intent of each was to provide municipalities across the country with a framework that they could use to write or update their local lighting ordinances. (The IDA's mission is to preserve the night sky; the IES is the technical society for illuminating engineering, which writes outdoor-lighting guidelines and recommendations for those involved with illuminating engineering and lighting design.)

The common goal for both associations was to produce a defensible ordinance that allows quality lighting while greatly reducing light pollution and light trespass. But it became apparent that two model ordinances would lead to confusion and inconsistencies. So in November 2005, the two organizations agreed to form a joint committee, the Model Lighting Ordinance Joint Task Force (MLOJTF), which was charged with developing an industrywide Model Lighting Ordinance (MLO). Committee meetings commenced in early 2006.

The overall goals were for the MLOJTF to develop an ordinance that could be applied to any small or large municipality; easy to understand for city planners, enforcement officers, and applicants; comprehensive enough to address all outdoor lighting; technically sound; and sure to reduce light trespass and light pollution.

DEVELOPING AN ORDINANCE FROM SCRATCH

The initial MLO pulled from several sources. It combined existing outdoor lighting codes, California's Title 24 energy code, and substantial revisions that included revising energy budgets to maximum lumen allowances; addressing luminaire backlight, glare, and uplight; reducing light during curfew hours

including Lighting Zone Zero for areas with no continuous outdoor lighting; and adding a performance method for complex lighting projects.

As work continued, it became clear that simply patching together existing codes would not really address the concerns and goals that had prompted the decision to create such a document in the first place. While a significant amount of previous work was incorporated and was very valuable, the MLOJTF had to create a substantial amount of new material. None of the existing ordinances were comprehensive enough to incorporate all of the goals, especially a method for dealing with complex lighting projects. Prior to the MLO draft, ordinances would typically categorize these projects as "special review," but not provide any means for the planning staff to hold a review.

DISCOVERING WEAKNESSES IN CURRENT RECOMMENDATIONS

One drawback to the initial version of the MLO was with the IES uplight-outdoor-luminaire classification system. This system classified luminaires as full-cutoff, cutoff, semi-cutoff, and non-cutoff depending on the percentage of uplight emitted from the fixture. It did not address how much uplight would be acceptable, nor did it address glare and backlight potential. For example, a 1,000W luminaire may be classified as full-cutoff yet have a higher glare potential than a 5W incandescent lamp non-cutoff luminaire.

Designing a new luminaire classification system that addressed the absolute amount of light for backlight, uplight, and glare appeared to be necessary for the MLO. As a result, the IES created and issued a technical memorandum, TM-15, in 2007. Commonly called the "BUG" (backlight, uplight, and glare) rating, it is incorporated into the MLO text, and the MLO User's Guide explains how it works.

HOW THE PROCESS WORKED

First Public Review (Feb. 9–Apr. 10, 2009): The MLOJTF took almost three years to develop the first document for public review. The comments received from across the lighting industry were extremely helpful, and the task force realized that major revisions were required. First, the MLO had to be simpler. The Complete Site Method was too complex as a prescriptive method, so it was changed to fall under the performance method. A user's guide was added to help explain the details of the MLO and provide examples. The second major revision did include street lighting as an optional ordinance for municipalities that want to have a simple street lighting ordinance.

Second Public Review (June 24–Aug. 23, 2010): The major suggestion from the MLO's second public review was to use initial luminaire lumens instead of initial lamp lumens. This was adopted and it puts all luminaires on an equal basis and encourages quality designs. Using this measurement also means that absolute versus relative photometry is no longer an issue.

Many commenters were also confused about the uplight values and why a substantial amount of uplight was being allowed in Lighting Zones 3 and 4. Since the uplight value was linked with a glare zone that is at a higher angle, this value permitted more uplight in LZ3 and LZ4. As a result of this feedback, uplight will be decoupled from these glare zones, which requires a modification to TM-15. (The next revision of TM-15 is presently under way.)

Comments varied when it came to the performance method Lumen Allowance Values, but the majority of respondents felt that the values were still too high to reduce light-trespass and light-pollution goals. Independent reviews showed that if an applicant applied every single layer allowance, then lighting levels would far exceed IES recommended values. The lumen allowances and the number of extra allowances are being reviewed to address this issue.

LZ4 allows for higher lighting levels, which may be only appropriate for areas that have continuous nighttime pedestrian use. Stronger caution statements were inserted emphasizing that LZ4 is not a default lighting zone.

HOW HAS THE MLO CHANGED FROM ITS FIRST VERSION?

The MLO has improved greatly because of the public review process. The comments were constructive and helped in developing the current MLO language. We simplified the prescriptive method, developed an optional Street Lighting Ordinance, added a user's guide, replaced initial lamp lumens with initial luminaire lumens, minimized the number of additional allowances (performance method), reduced the lumen allowances (performance method), revised the BUG system to decouple the glare from the uplight, required a revision to TM-15, recalibrated the uplight to match the lighting zone (U0 equals LZ0, U1 equals LZ1, etc), and discouraged the use of LZ4.

The current version is far more than a compilation of parts from previous codes. It has essentially been rewritten completely through a rigorous and sometimes heated effort to embrace a range of concerns. At every step of the way, the MLO required goals evaluation. For instance, were reduced lighting allowances during curfew hours technically sound? Were lumen allowances actually reducing light pollution? Is the performance method too complicated for a small municipality?

The MLO includes sections on lighting zones,

MODEL LIGHTING ORDINANCE JOINT TASK FORCE:

Nancy Clanton, Clanton & Associates, representing the IDA (chair)

Jim Benya, Benya Lighting Design, representing the IDA (former chair)

Cheryl English, Acuity Brands Lighting, representing the IES

Eric Gibson, Kenall Manufacturing Company, representing the IES

Denis Lavoie, Philips Lumec, representing the IES

Leslie Lipstein, Leslie Lipstein Consulting, representing the IDA

Naomi Miller, Pacific Northwest National Laboratory, representing the IES

Michael Mutmansky, Clanton & Associates, representing the IDA

Leo Smith, International Dark-Sky Association, representing the IDA

John Walter, National Grid, representing the IES

general requirements for all outdoor lighting, requirements for nonresidential outdoor lighting, requirements for residential outdoor lighting, lighting by special permit only, existing lighting, enforcement and penalties, and the usual tables and definitions. An optional street lighting ordinance is included for those smaller communities that may not have a separate street lighting ordinance, but is not properly part of the MLO.

The user guide is incorporated as parallel text into the MLO and is a substantial improvement. It should make adoption much easier. For each section, terminology is explained and examples are often shown in order to illustrate the more formal language. Initial response from reviewers has been that the guide is both technically accurate and helpful.

WHAT IS NEXT?

In March, the MLO went to the IDA and IES boards of directors for conditional approval. While the MLO is going through these reviews, the performance method values will be undergoing a validation. This validation is necessary to calibrate the prescriptive with the performance method, and to evaluate the MLO values in comparison to the light level values described in the new IES 10th edition *Lighting Handbook* due to be released in the second half of 2011. Since many of the outdoor lighting levels are changing in the new handbook, this is a great opportunity to make sure the MLO matches. The goal is to have the MLO ready for use this summer, if all goes well.

WILL THE MLO REDUCE SKY GLOW AND LIGHT TRESPASS?

My prediction is yes. California Outdoor Lighting Baseline Assessment CEC P500-03-082-A-18 shows that only 33 percent of all outdoor lighting in California is full-cutoff, and that 48 percent is non-cutoff. It seems clear that regulating luminaire uplight and glare will greatly reverse these trends. By limiting lumen allowances, overlighting will be curtailed, thus reducing sky glow.

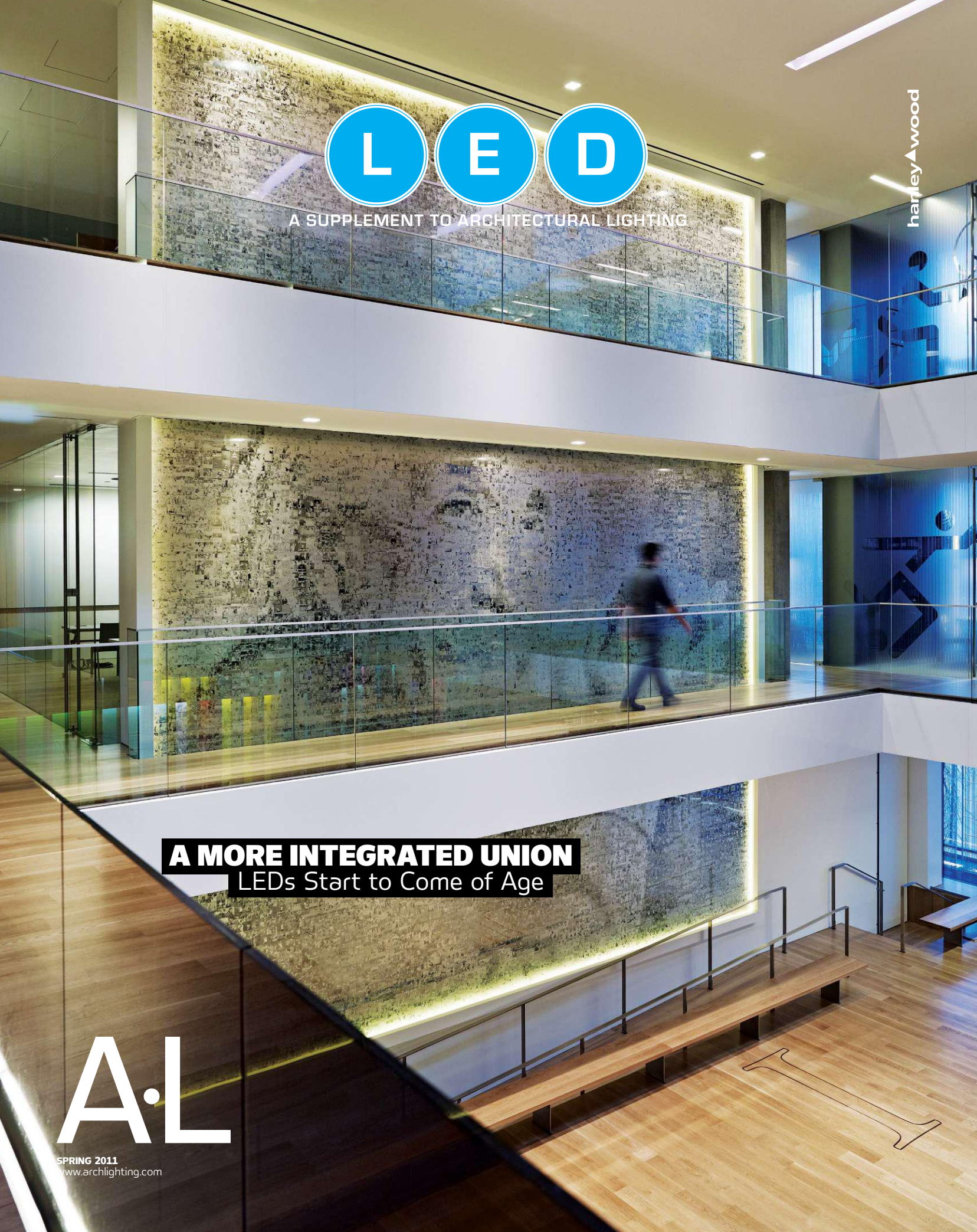
Use of lighting zones will help communities customize the MLO. For instance, smaller communities may choose to only use one lighting zone, while larger ones may have multiple zones. This will prevent overlighting and light trespass, especially in mixed-use neighborhoods. Complex lighting designs will still need to meet requirements that minimize sky glow and light trespass.

WILL THE MLO BE SUCCESSFUL?

The MLO should be successful, since the goals are ones we can all agree on. But the MLO will only be successful when it is adopted nationwide as a de facto standard. This will require community support efforts and education. Supporting communities in the process of assigning lighting zones to their municipalities and adopting the MLO is crucial. Education for lighting designers, engineers, developers, and city planning departments will allow a higher MLO success rate. Cooperation with lighting manufactures in supplying BUG ratings and initial luminaire allowances for all luminaires will make the applications simpler.

It was also crucial to have lighting professionals involved in this process of writing and evaluating the guidelines, ordinances, and code revisions. Without the lighting designers' involvement, practitioners have to live with poorly written regulations that affect our designs. It would have been great if the MLO had taken less time to develop, but I believe that the time, effort, and resources spent have been well worth it and have resulted in a quality MLO document. It has been a long journey for the MLO, but the destination is finally in sight. •

Nancy Clanton, PE, IALD, FIES, president of Clanton & Associates in Boulder, Colo., is chair of the IDA/IES Model Lighting Ordinance Joint Task Force, chair of the IES Outdoor Environmental Lighting Committee and IES Mesopic Committee, and serves on the IDA Board of Directors.



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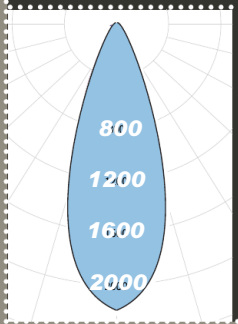

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Steve Cridland (top left); Neil Webb (top right)

IT'S LIKE A FERRARI AND A HYBRID HAD A BABY.

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"The conversation about LEDs should unite the industry and move lighting forward. It should not pit people against one another and divide our community."

IT'S WHAT YOU SAY AND HOW YOU SAY IT

For the past eight years, I have watched solid-state lighting make major inroads in the architectural lighting industry. It is amazing to think how far LEDs have come, from color-changing applications to white-light sources for both exterior and interior installations. I remember the buzz at Lightfair in 2005 when then-Canadian manufacturer TIR Systems introduced its Lexel platform—the first fully integrated LED source for general illumination. At the time, it seemed as if we'd have to wait for ages until market-ready specification-grade LED luminaires could serve as viable alternatives to existing sources.

Of course, solid-state lighting has largely lived up to its early promise, effectively changing the course of the lighting industry. This change has not been without its share of headaches, as manufacturers struggle to keep up with one another in developing new solutions, and designers try to stay informed about the technology.

Even though LEDs are an innovative type of light and offer great potential, they are not always likable. At times, they seem like the source that everyone loves to hate.

There are several reasons for this. First, LEDs represent a major paradigm shift for the lighting industry and design community, and adjusting to change is not always easy.

Also, the tone of the conversation surrounding LEDs has been off-putting to some. When LEDs arrived on the lighting scene, they announced themselves, basically, as the replacement for every type of existing filament lamp. Bold words for a technology that had yet to deliver any products to market.

While the intentions of most manufacturers bringing LED chips, lamps, and light fixtures to market has been good, there have been an unfortunate number of misrepresentations and false claims about some product offerings which has set the conversation back. With every false claim, there has been loss of trust within the lighting design community. Matters are beginning to turn around, slowly, thanks in part to a group of technical references such as LM-79 and LM-80 that are beginning to form a standard reference point.

But the tenor of the conversation continues to be aggravating at times, especially when LED manufacturers persist in speaking as though their products are the only viable light source on the planet. LEDs are one tool in the lighting designer's toolbox, but not the only one. If these manufacturers want to be taken seriously and be respected by the design community, then they need to be able to talk about their product and technology offerings as one piece in a larger lighting equation, but not at the expense of other sources that still work extremely well and meet project needs from an aesthetic, technical, and energy-savings perspective.

At the beginning of February, I attended the U.S. Department of Energy's Transformations in Lighting SSL R&D workshop in San Diego. It was an informative experience both in terms of what was discussed and how it was discussed. Fully aware of the purpose of the venue, I nevertheless found it disturbing to hear during several of the presentations what was, at times, very aggressive language in comparing LEDs to other types of light sources. Phrases like "declared victory" and "we've won the war" were bandied about. Last time I checked, introducing a new lighting technology had nothing, thankfully, to do with war.

As the conversation about LEDs moves forward, I hope that all members of the lighting community will be respectful of the full range of available technologies. This conversation should unite the industry and move lighting forward. It should not pit people against one another and divide our community.

Elizabeth Donoff
Editor

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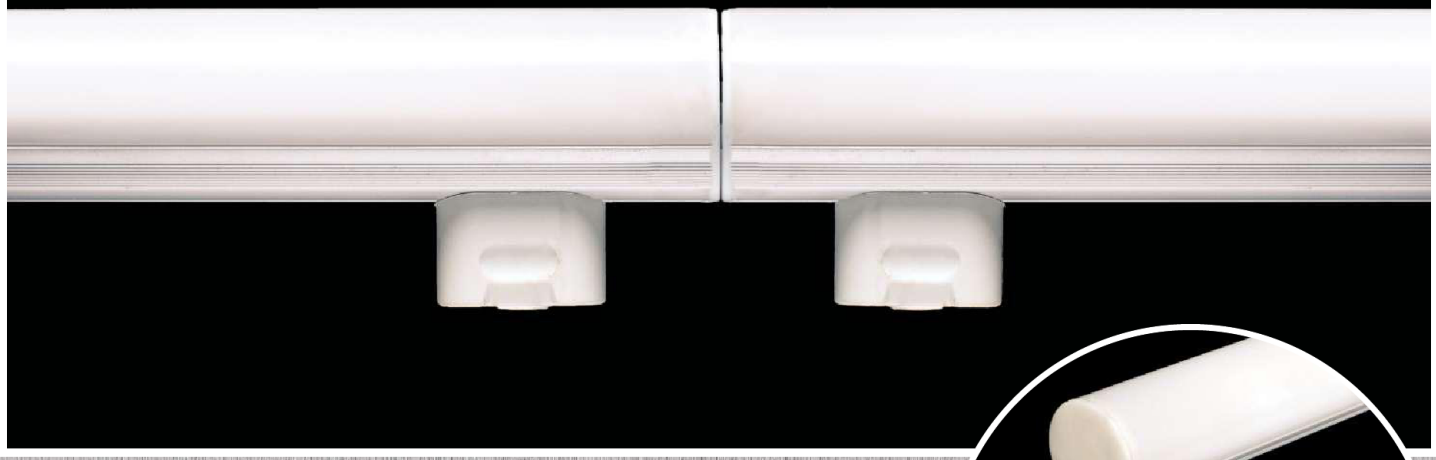

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THIRD ANNUAL NEXT GENERATION LUMINAIRES COMPETITION WINNERS ANNOUNCED

Manufacturers continue to innovate with market-ready specification-grade LED luminaires.

text by Elizabeth Donoff

As LED luminaires become more prevalent in the marketplace, designers and manufacturers alike need ways to evaluate market-ready specification-grade product offerings. One such vehicle is the Next Generation Luminaires (NGL) Solid-State Lighting (SSL) Design Competition. Launched in 2008, this program for commercial solid-state lighting fixtures is sponsored by the U.S. Department of Energy, the Illuminating Engineering Society, and the International Association of Lighting Designers.

The recent class of winning luminaires was announced Feb. 23 at the Strategies in Light Conference in Santa Clara, Calif. This year's competition received 328 submissions; last year's total was 265. But, because of the NGL's strict documentation requirements, only 138 fixtures advanced to the judging stages. Fixtures that did not advance were either not market-ready or the manufacturer could not provide adequate documentation, such as LM-79 and LM-80 reports.

Sixty-one different manufacturers submitted the 138 products reviewed by the judges. From this group, 33 of the products were selected as Recognized winners, indicating that they are specification-worthy.

Four fixtures were chosen Best in Class, standing out both in terms of aesthetics and technical performance. These were the Lighting Quotient's Fraqtir, a linear concealed LED covelight; Philips Color Kinetics' eW Burst Powercore, a façade luminaire; Koncept Technologies' Equo LED desk lamp, a tasklight; and USAI's NanoLED, a recessed accent luminaire.

The NGL jury also created a new category this year, Notable, to recognize those fixtures that are not specification-ready, but have "at least one outstanding characteristic deserving of recognition," according to a press release from Next Generation Luminaires. Manufacturers receiving this mention were Zumtobel, Philips Wide-Lite, Illumination Machines, Liton Lighting, and Landscape Forms.

Overall, 11 fixture categories were represented in this year's NGL competition: accent tracklighting, recessed accent lighting, wallwashing, wall grazing, recessed downlighting, decorative pendant lighting, decorative wall lighting, general illumination, industrial lighting, in-grade lighting, and street and area lighting

The NGL products are reviewed over a two-day period by a jury of 12 individuals representing a cross section of the lighting design, manufacturing, and research communities. This year's judges were Gabe Arnold, Mary Matteson Bryan, Nancy Clanton, David Ghatan, Glenn Heinmiller, Barbara Horton, Kevin Houser, David Malman, Avraham Mor, Randy Sabedra, Melanie Taylor, and Richard Wyton. •

Next Generation Luminaires Design Competition
For complete information and an overview of all the prize-winning fixtures, go to ngldc.org.


Fraqtir


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Courtesy the Next Generation Luminaires Competition

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LED LEARNING

The DLFNY's LEDucation 5 draws huge crowds in New York City.

text by Elizabeth Donoff

In its fifth year, LEDucation continues to draw large crowds and provide a much-needed industry resource for the exhibit and educational discussion of solid-state lighting (SSL) products and materials. Organized by the Designers Lighting Forum of New York (DLFNY), an all-volunteer group, this year's event on March 16 recorded 1,877 attendees during the course of the nine-hour event. The time frame allowed attendees to visit at their leisure throughout the workday. LEDucation draws attendees traditionally from New York, New Jersey, and Connecticut. But since the show has become an important outlet for seeing the latest LED products, it has now become a draw for designers all along the northeast corridor.

Eighty-nine manufacturers from across the U.S. displayed their latest product offerings in two exhibit spaces, and visitor traffic was steady throughout the day. Based on the displays, it is clear that market-ready, specification-grade LED luminaires have come into their own. There were product offerings with "real legs" for design applications, which allow lighting designers new possibilities.

In addition to the manufacturer tabletop displays, five education seminars discussed various aspects of SSL technology. Michael Myer of Pacific Northwest National Laboratory provided an overview of the latest LED standards updates. Lighting designer Barbara Horton of Horton Lees Brogden Lighting Design discussed her experience as a judge for the Next Generation Luminaires Solid-State Lighting (SSL) Design Competition. Lighting designers Brian Stacy and Richard Fisher of Arup discussed the integration of LED lighting technologies in their lighting design for the Yas Marina Hotel in Abu Dhabi, United Arab Emirates. Eric Lind of Lutron Electronics discussed some of the intricacies of dimming in his presentation "What Does 'Dimmable' Mean in the LED World?" The seminars then concluded with Ron Steen of Xicato discussing white-light color issues as they pertain to SSL. (ARCHITECTURAL LIGHTING mediated a roundtable discussion with all five of the presenters. See page 15.)

All the sessions had a full audience, verifying that there is not only great interest in up-to-date, reliable information about LEDs, but a great need for these educational venues that speak directly to an architectural, interiors, engineering, and lighting design audience.

The DLFNY and its LEDucation Committee have organized an event that gives the design community a valuable way to stay informed about LEDs and their impact on lighting. Planning is under way for LEDucation 6. •

L PRIZE MODIFIES ITS PAR 38 REQUIREMENTS

The U.S. Department of Energy has temporarily suspended entries into the PAR 38 category for its L Prize competition in order to make the competition more effective.

text by Elizabeth Donoff

The U.S. Department of Energy (DOE) has announced plans to modify the competition requirements for the L Prize's PAR 38 category. On Jan. 5, the DOE temporarily suspended the PAR 38 portion of the competition, and entries will not be accepted until that category reopens in May. The 60W replacement-lamp competition category will remain open during this period.

The DOE decided to close the PAR 38 category so that it could make modifications based on lessons learned from the 60W replacement competition. The legislated technical requirements for the PAR 38 competition will remain unchanged, and the DOE plans to announce and publish the revised PAR 38 requirements at Lightfair in May.

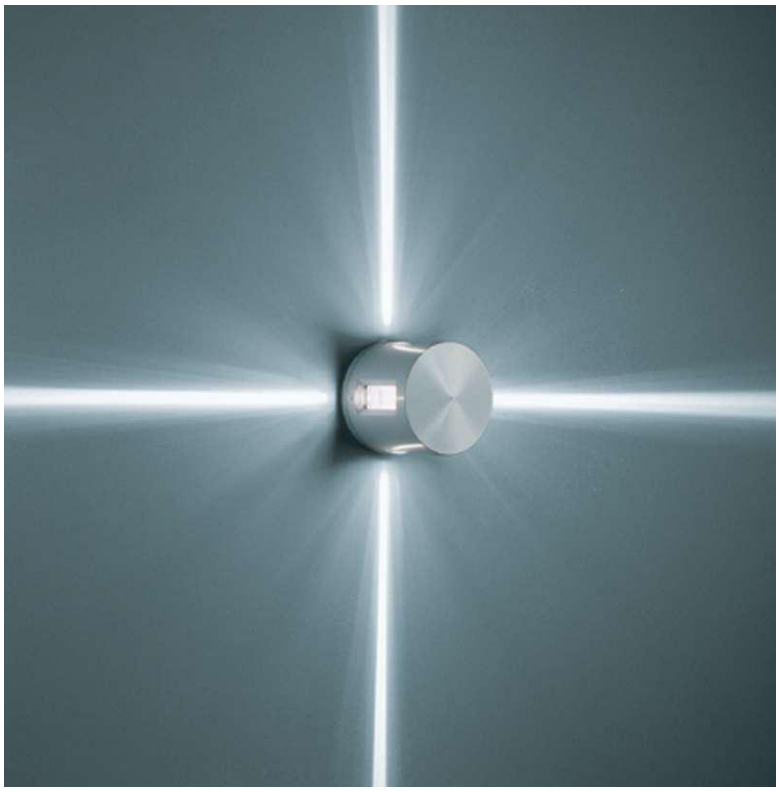
The L Prize is sponsored by the DOE and is the first government-sponsored technology competition designed to encourage lighting manufacturers to develop high-quality, high-efficiency solid-state lighting products to replace the common incandescent light bulb. The competition was originally announced and outlined in the Energy Independence and Security Act of 2007. •

LEDS LEAD THE WAY

The latest in LED luminaire offerings.

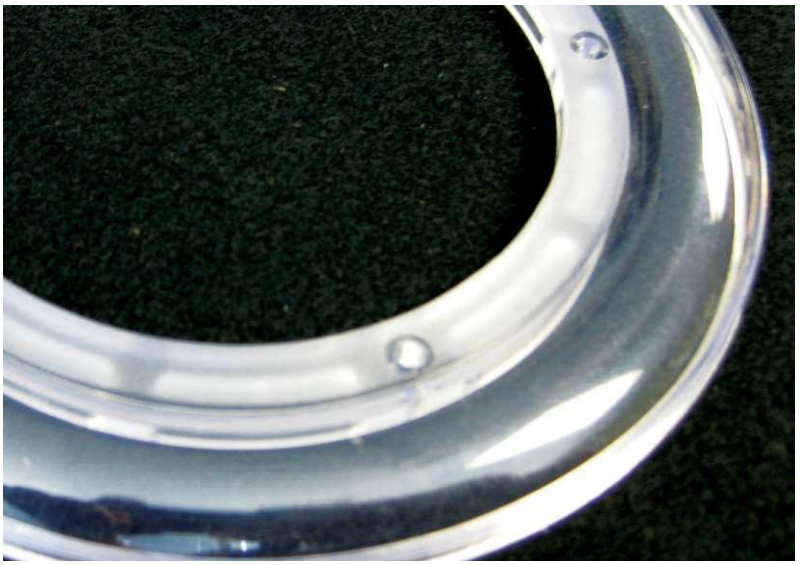
text by Elizabeth Donoff

StreetSense Series LED Streetlight, Dialight • Dialight's latest roadway and area-lighting luminaire features an exclusive optic technology for precise light placement and energy-efficiency requirements. According to the manufacturer, StreetSense delivers up to 75 lumens per watt and 70 percent lumen maintenance over 60,000 hours. Featuring a cast-aluminum housing with a UV- and abrasion-resistant polycarbonate lens and an integrated driver design, the fixture uses the latest Cree XLamp XP-G LEDs to provide a cool, white light with a color rendering of 70. Optional dimming capabilities are also available along with photo controllers for dusk-to-dawn operation. LM-79 test reports are available. *dialight.com* • Circle 140

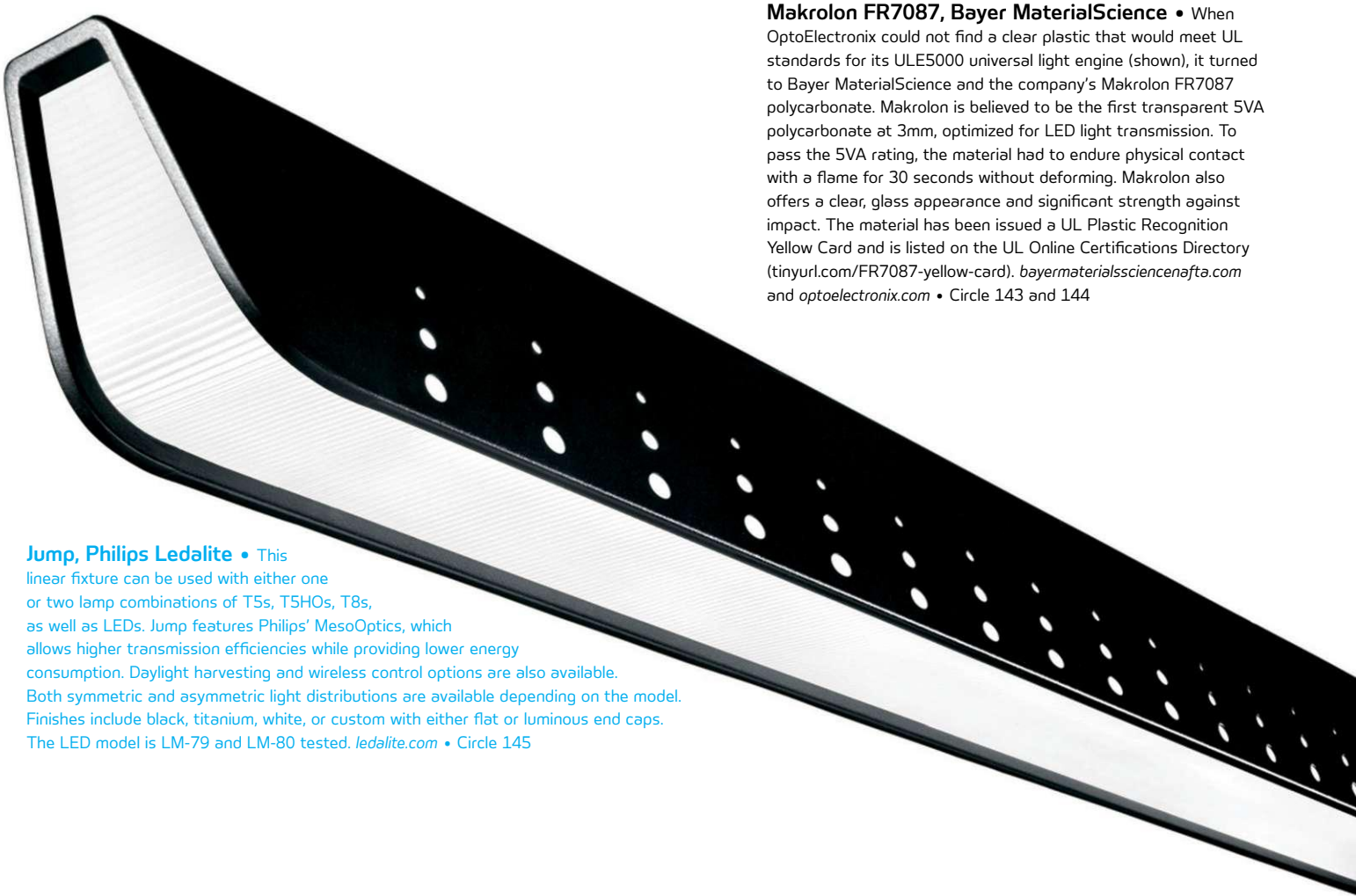


Blitz LED, Sistamalux • Blitz LED is a miniature accent light for architectural outdoor wall applications. With three beam configurations—one, two, or four 4-degree narrow directional—myriad design layouts are possible. The luminaire has three source options: six 2.5W white 6500K LEDs, six 2.5W white 3000K LEDs, and six 2.5W blue LEDs. It also has a housing in either a white or an aluminum-gray finish and is IP65 UL-listed as suitable for wet locations. An additional plastic stake accessory is available for ground installation. *sistamalux.com* • Circle 141

Mega Zeni Series, Sharp • These new 15W and 25W white light LED modules from the Mega Zeni series are compact, lightweight, economical, and extremely bright. Color temperature ranges from 2700K to 4000K, and depending on the model, the LEDs produce a light output of up to 2,550 lumens, a luminous flux of 102 lumens per watt, and a 40,000-hour life at a service temperature of 80 C. The LED measures 24mm by 20mm by 1.8mm and uses an aluminum ceramic plate as the carrier material for the chip base. *sharpsme.com* • Circle 142



Makrolon FR7087, Bayer MaterialScience • When OptoElectronix could not find a clear plastic that would meet UL standards for its ULE5000 universal light engine (shown), it turned to Bayer MaterialScience and the company's Makrolon FR7087 polycarbonate. Makrolon is believed to be the first transparent 5VA polycarbonate at 3mm, optimized for LED light transmission. To pass the 5VA rating, the material had to endure physical contact with a flame for 30 seconds without deforming. Makrolon also offers a clear, glass appearance and significant strength against impact. The material has been issued a UL Plastic Recognition Yellow Card and is listed on the UL Online Certifications Directory (tinyurl.com/FR7087-yellow-card). *bayermaterialssciencenafta.com* and *optoelectronix.com* • Circle 143 and 144



Jump, Philips Ledalite • This linear fixture can be used with either one or two lamp combinations of T5s, T5HOs, T8s, as well as LEDs. Jump features Philips' MesoOptics, which allows higher transmission efficiencies while providing lower energy consumption. Daylight harvesting and wireless control options are also available. Both symmetric and asymmetric light distributions are available depending on the model. Finishes include black, titanium, white, or custom with either flat or luminous end caps. The LED model is LM-79 and LM-80 tested. *ledalite.com* • Circle 145

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Architectural Lighting Magazine announces the 8th Annual A·L Light & Architecture Design Awards honoring outstanding and innovative projects in the field of architectural lighting design. Winning projects are published in the July/Aug 2011 issue and featured on archlighting.com. The awards program is open to design professionals worldwide. Projects must have been completed after July 2009.

Full details and entry forms available March 2011 at archlighting.com.

A·L LEADERSHIP IN LIGHTING 25 YEARS
ARCHITECTURAL LIGHTING

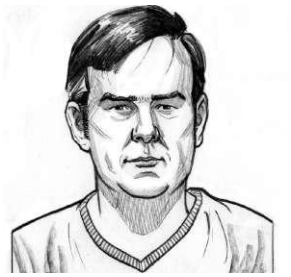

Brian Stacy


Eric Lind


Barbara Horton


Michael Myer


Richard Fisher


Ron Steen

LED ROUNDTABLE

Industry leaders discuss the impact that solid-state lighting is having on the industry.

moderated by Elizabeth Donoff
illustrations by Eugene Smith

Solid-state lighting is transforming lighting in every aspect—from fixture design to design applications. ARCHITECTURAL LIGHTING *recently spoke with Richard Fisher, Barbara Horton, Eric Lind, Michael Myer, Brian Stacy, and Ron Steen—the speakers at this year's LEDucation program, which took place on March 16. These six are a cross section of the design, manufacturing, and research sectors of the lighting industry, and they talk about their concerns and excitement about how LEDs are impacting architectural lighting design and luminaire development. What follows is an excerpted version of that conversation.*

What impact is solid-state lighting having on the design practitioners and manufacturers?

Barbara Horton: I have been reluctant about LEDs for some time, but my introduction to the Next Generation Luminaire program really made a big difference for me. In every era, we seem to engage in new technology, and while this one is a little bit more complex ... it's just more to learn. There is definitely a learning curve but, at least in our office, we've embraced the technology, and are seriously looking at it as a basic and dominant tool now. If you had asked me two years ago about that, I would have laughed.

Eric Lind: From a manufacturer's perspective, it's much different. It's the coordination involved with a new source. In the past, with fluorescent in particular and maybe even metal halide, there were fewer moving parts and pieces. It tended to be more sequential—a lamp being developed, then a ballast, and then a fixture around it. Much more with LEDs is concurrent and I think that's put a greater burden on manufacturers to coordinate from the LED module to the driver to the fixture. Timing is also affected. The world has become very comfortable with mixing parts and pieces with metal halide and fluorescent where you have ballasts that are UL-listed. If you want a fixture [for LED] that's UL-listed, the entire assembly has to be listed.

Will that change over time as there are more LED fixtures on the market?

Lind: I would tell you that once there is some movement toward a standard socket, I think there will be, potentially, the opportunity to move drivers to a point where they can be UL-listed. It's a question of when.

Ron Steen: We're riding a curve. Two or three years ago, efficacies were sitting around 10 to 20 lumens per watt. Now, we are seeing 50, 60, 70 lumens per watt, with a theoretical headroom of 220. Lead times of the technology are going to continue to evolve. It's better we prepare for the ride for the next three or four years—and maybe it's even more like 10 years.

Are there instances where components could stabilize so a baseline standard can be set?

Steen: People are going to start normalizing on lumen package; at least I hope that they do. And there is going to continue to be pressure on energy savings.

Michael Myer: Any bit of interchangeability would be great at this point. Drivers that are forward phase and a reverse phase. Everything is very different right now.

The thing I like about LEDs is that we don't

THE LED ROUNDTABLE PARTICIPANTS

Richard Fisher joined Arup's New York office in 2008. With his background in architectural and theatrical lighting design, he focuses on lighting-control systems design and integration, and has worked on projects including theaters, corporate headquarters, hospitality, and sculpture lighting.

Barbara Horton is president/CEO and senior principal at Horton Lees Brogden Lighting Design in New York. As a design principal she has the opportunity to work on projects around the world, and her design skills allow her to meet each challenge from the design stage to installation.

Eric Lind is vice president of global specifications at Lutron Electronics in Coopersburg, Pa., and has overseen the development and expansion of Grafik Eye and related products. He is currently working on new control technologies for energy-efficient lighting sources. Lind serves on the IES Board of Directors, IES Progress Committee, and the IALD Lighting Industry Resource Council.

Michael Myer has been with Pacific Northwest National Laboratory (PNNL) in the Lexington, Mass., office for the past three years. Previously, he worked for Naomi Miller Lighting Design and before that Hayden McKay Lighting Design. Since joining PNNL, Michael has worked on projects that include Appliance Standards for the Department of Energy (DOE) Solid-State Lighting Commercialization, and the DOE's Commercial Building Energy Alliances.

Brian Stacy is Arup's lighting leader, and an associate principal, and the principal lighting designer at the firm's New York office. Stacy has been instrumental in building an international network of lighting designers within the company. The core business of this network is designing integrated daylighting and architectural lighting. He incorporates his keen interest in the use of cutting-edge control and LED technology on all projects.

Ron Steen, vice president of business development at Xicato (based in the Lindenhurst, Ill., office), has been working with LEDs since 1996. He successfully brought the first full-function LED tail lamp to market in 2000 and did pioneering work on the LED headlamp. Prior to joining Xicato, he was Philips' director of product management for solid-state lighting systems and drivers.

need more efficacious products, we just need better lighting. Rather than having to keep pumping out more and more light, maybe we should start thinking about: Why do we want so much light?

Richard Fisher: What's interesting from my point of view, as a young designer, is starting to understand more about what the technology means in terms of light. People are understanding what LEDs can do instead of just pushing for efficacy.

Brian Stacy: It's been interesting to hear this desire for standardization because, for me, it's a tool that goes back to a time in the industry where lighting designers were, in a way, a little bit like craftsmen putting together components that weren't necessarily just a spec-ready system. To actually compose, to be able to create with light. It feels like we kind of have a source again that has given us the ability to have nonstandard lighting.

Are there certain ways in which LEDs are impacting lighting for better or worse?
Myer: I sometimes do get frustrated that often the first thing people say is, "We're looking for an energy solution. What about LEDs?" Fluorescent is a great product for certain applications. Other technologies can be as efficient or more efficient—and possibly cheaper. And yet everyone is saying it has to be LED. Very few people are asking you for T5 lamps or metal halide but everybody knows what an LED is.

Everyone knows "LED" because the term is out there in the general parlance, but that doesn't mean that everybody knows what an LED is or how it works.
Horton: It's just like any other source that you dealt with in the past, they [owners] just don't understand it. The owners, particularly, have this impression of LED being such a panacea. When I have to deliver that, gee, your T8 or your T5 fluorescent is still a more efficient system or delivers more for the dollar at the moment, they get very disillusioned that maybe LED is not the right thing—and then they have a bad impression about it.

We have projects right now where people are putting LEDs behind closed walls … and we are trying to explain to them that you still have to get to it, that it still has a life and it has heat issues and all the other things that go with it. It's unfair that it ends up, again, back on the designer to have to really educate the clients and the architects about it.

Stacy: I see that as part of our job, educating our clients about the technologies. Its about being able to understand what the client's goals really are with it. It does give us, as practitioners, the ability to be seen as the ones who understand the technology, but also as ones who can help a client add value to a project.

Steen: The other point is that there's really a lot of bad LED product … out there.

Stacy: The lighting industry has an LED hangover and we need to get rid of it.

Steen: We can all jump in and see just some absolutely abysmal LED light bulbs that are out there. There are a lot of good products that are coming out now, but part of the fear is that within other channels, people are taking some of these really bad products and just stuffing it in demonstrations.

What can be done to deal with bad products? How can we get across that they're putting a lot in jeopardy for the industry?
Lind: We constantly tell people to do mock-ups. The other part of the problem isn't just some downlights from 15 or 20 companies, we also have to consider that you've got billions of Edison-based sockets where people are going to be replacing lamps. People started with CFLs and they're a mixed bag in terms of performance. But now, people are trying to jump into LEDs. I've been excited to see more and more design firms doing their own testing in their offices or they are getting clients to understand the benefit of a mock-up.

Stacy: This middle process becomes as equally important. We're starting to include language within our spec—and I've been test-running it on a few projects—if you changed out an LED product for something different, to provide the base and the substitution to show that it's [the replacement] equal or better.

Should there be a new specification document developed to address this type of source and the various components that go with it?
Stacy: I think it's much like the IALD Spec Integrity document that was issued years ago and in the somewhat recent update. It's about being able to have good language inside of the specification, just so it's clear and everybody is on the same page, so that not only the

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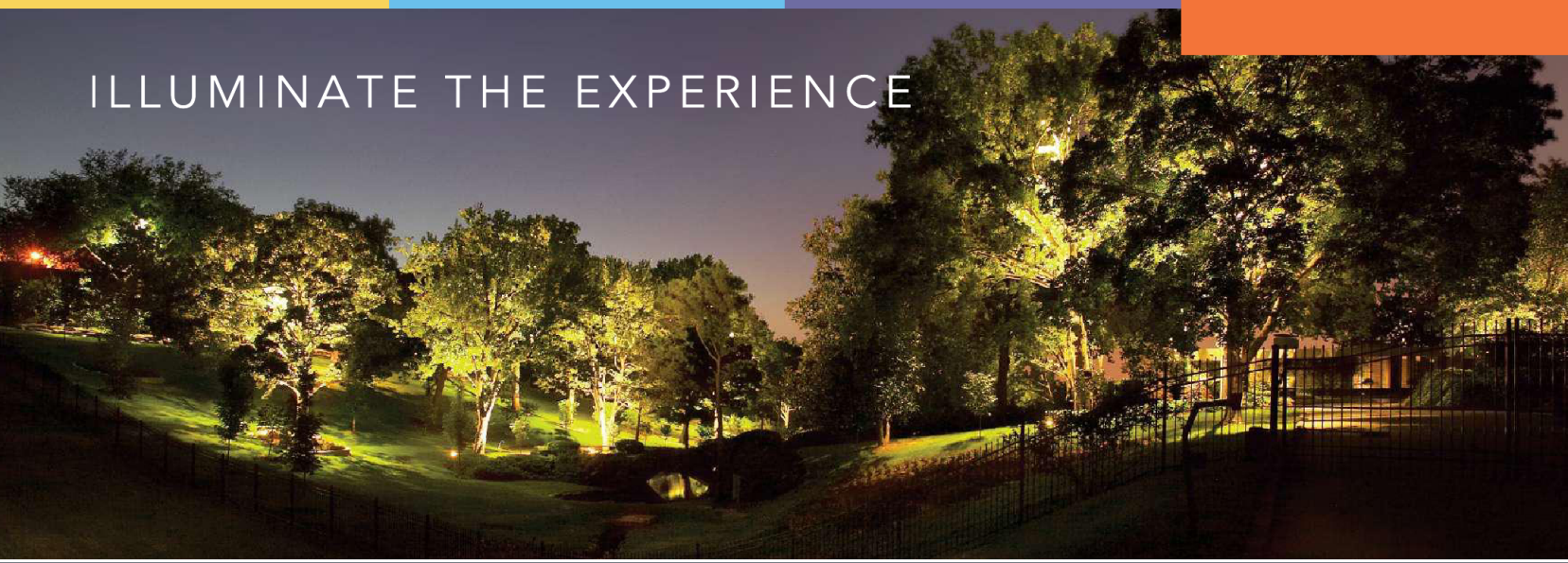

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"Two or three years ago, efficacies were sitting around 10 to 20 lumens per watt. Now we are seeing 50, 60, 70 lumens per watt with a theoretical headroom of 220. … It's better we prepare for the ride." — Ron Steen

designers or the architects or the owners, but also the contractors and manufacturers, don't get burned.

Steen: I think the specification is a huge deal because you really need to get in there and be talking about what kind of CRIs you want, getting back to the lumen packages as opposed to just what kind of power you want out of the device. All of those things become critically important to what's actually being specified.

Lind: No doubt, specifications are probably the most critical piece. But it starts with the specification data that's being given by the manufacturers, many of whom … don't realize some of the details that were critical in terms of applying these products into a building.

Is there something that's being overlooked because everybody has put so much focus toward solid-state lighting right now?

Myer: R&D comes from three places: government, academic research, and industry. Manufacturers are going to chase where they think there is either money to be had or money on the table. The Department of Energy does support many different technologies through R&D and non-R&D efforts, not just LED. We have many lighting programs which support non-solid-state lighting entirely. We are also seeing R&D happen as a result of federal and state appliance standards that force lighting technologies to get better.

Stacy: One other part of the equation is the whole venture capital [VC] funding mechanism, and I think the vast majority of the money that's going into R&D—the VC money that's going into lighting—is into LEDs, whether it be the standard LEDs, OLEDs, or controls.

Why is it that solid-state lighting is under a kind of scrutiny that's very different from what other sources have had in the past?

Steen: To get into LEDs is as simple as somebody having a reflow machine … to put some prepackaged LED downlight to a board. In the past, you had to spend $10 million on an

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HID line; there were very few people that would be jumping into that game. Plus, there is the entire promise of the huge energy savings. Without the scrutiny and the potential glut of bad product, that could be a recipe to not achieve the energy savings. Would you agree with that, Michael?

Myer: The cost is different and there are a lot of people who are coming from another industry. They can make some great semiconductors but not lighting products. Scrutiny is warranted, even if it's more. Barbara used a great word earlier—panacea. In the last 20 years, there have been two things that everyone has been jazzed about—fiber optics and LEDs. Fiber optics didn't pan out, and this one [LEDs] seems to be the one with a real foothold. People are saying, "Let's make sure it's not another flash in the pan."

Stacy: With other lamp technologies, it's primarily been one of the majors that were tweaking or coming up with a new source. Now there are so many other players. We have to see how it all plays out.

Lind: My memories of new lamps [are] tied to very targeted applications. They identified a couple of very good areas where the product could be successful, and certainly early LEDs did just that. A lot of the initial LEDs were in the accent side or theatrical side where they weren't the primary illumination of the space.

LEDs are coming on the heels of the CFL being "the solution for the world." I don't think everybody's expectations of that lamp were ever satisfied. So there is a little bit of a "Wow, this is incredible," and also a "We did this just a few years ago, are we making the same mistake that everything can be solved?" It's a very good scrutiny, quite honestly.

What do you say to your colleagues who are frustrated right now with LEDs in terms of specifying them?

Horton: I don't know if my colleagues are frustrated. I know that there is more worry—and the liability, they're sensing it. But I don't know that people are frustrated about it. I think the design community is very excited about the possibilities. It opens up a whole different world for us and I think that's really exciting.

Fisher: There may be some frustration when you're writing specifications, but I think it's more the frustration when you've written your specifications and people are sending back things and not referencing the spec document.

Where do you see solid-state lighting in the next few years?

Steen: We're going to be riding this curve until we reach the theoretical maximum. What I am really hoping for is understanding ... the lighting metrics that we really care about with LEDs. Are we going to accept lower light levels because we can do other things optically?

Horton: There are so many possibilities. The "smart thinking" of the fixture is the way that LED should go.

Stacy: I second that. There's been a relatively quiet [but] major addition to the DMX Control Protocol. It would be great to see some of that feedback logic that exists as part of DMX RDM to work its way onto a wider distribution to deal with things like thermal management or load setting with a more cost-effective approach.

> **"LEDs are coming on the heels of the CFL being 'the solution for the world.' I don't think everybody's expectations of that lamp were ever satisfied."**
>
> — Eric Lind

Myer: More feedback and integrated controls are needed.

Steen: It's about the integration of controls, controls-based systems, and intelligent LEDs.

How does sustainability factor into the LED discussion? This new source creates a whole new set of issues.

Fisher: I think almost every conversation we've had on a project, sustainability has come up. When we start to talk about sustainability and the client starts to mention a source, we try to steer away from a specific product to understand what the real goal of sustainability is for them and what they're trying to do.

Lind: It's an issue of whether or not the product has a method to be replaced. It's very hard, to simply test gear out and make some assertions as to how it will perform based on its rated life—and when you've got a length of time such as 50,000 hours, you have products being launched where you've got no experience probably beyond maybe 12 to 18 months when they get launched.

Myer: But I like the fact that as an industry, we are talking about it, we're not pretending it doesn't exist, or saying we'll deal with it later.

Can SSL withstand the current pressures in the economy?

Steen: Look at the Philips, the Osrams, the GEs—they are still spending lots of R&D dollars. You're going to see a lot of product continuing to come out. In general, I think that LED is actually helping the lighting industry ... people can start saving money with two- and three-year paybacks by going to LEDs.

Lind: In some cases, there is still the ... economic factor that doesn't affect me on the controls side as much as [it] affects, I think, people on the lamp and fixture side.

Steen: LEDs are riding a big momentum right now, where everybody has got to have them. I don't think we've experienced the hangover yet; I think we are still in the binge. So how is the hangover actually going to turn out?

Fisher: We're all in a position to help drive this boat if we can get in front of it and help decide what we want to do—and maybe reduce the hangover. •

To read the full version of this roundtable conversation, go to archlighting.com.

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MEETING THE TEST

The DOE's CALiPER testing program helps the lighting industry navigate the latest SSL product offerings.

text by Elizabeth Donoff
illustration by Neil Webb

No one in the lighting industry would deny that advancements in solid-state lighting technology move at lightning speed. To keep up with the new discoveries made in LED sources and LED luminaires, as well as the quantity of new products entering the market, industry standards such as the Illuminating Engineering Society's LM-79 and LM-80 have been created to establish a baseline by which LED fixtures can be evaluated. One of the principal avenues, as recognized by the lighting community, for evaluating products is the U.S. Department of Energy's (DOE) CALiPER program, which was started in 2006.

THE CALiPER PROCESS

CALiPER tests a wide selection of solid-state lighting products intended for general-illumination purposes. The program tests products two times per year through qualified, independent testing laboratories. The tests are blind and the DOE makes the reports available to the public—for "non-commercial, educational purposes only." Summary Reports provide a general overview of the test findings and are available on the DOE's SSL program website (www1.eere.energy.gov/buildings/ssl/reports.html). These reports do not list manufacturers; those are available in the Detailed Reports, which provide extensive data on the tested products and are provided to users who register on the DOE's SSL site and agree to follow the DOE's no-commercial-use policy. To date, more than 300 products have been tested.

The most recent CALiPER testing report—for Round 11 of testing—was released in October. It evaluated five types of fixtures and sources: arm-mounted roadway luminaires, post-top roadway luminaires, linear replacement lamps, high-bay luminaires, and small replacement lamps. The testing process occurred from March to September. To provide a benchmark for comparison, traditional lighting products that use incandescent, halogen, fluorescent, high-pressure sodium, pulse-start metal halide, or ceramic metal

halide lamps were also tested and included in the report.

Compared to previous rounds, Round 11 showed that LED products continue to achieve greater efficacies, and manufacturer performance claims have become more accurate, although there is still room for improvement. Round 11 also found that even though the LED outdoor fixtures tested "matched or exceeded their benchmark counterparts in efficacy, most showed significant variations in color characteristics ... and their distribution characteristics." Lastly, although LED linear replacement lamps have shown improvement, performance questions remain when it comes to light distribution, color quality, and reliability.

LINEAR REPLACEMENT LAMP CONCERNS

One product that has received particular scrutiny is the linear SSL replacement lamp, which varies in color quality and the methods used for dissipating heat from its tubular form. There is also concern about using linear SSL replacement lamps in recessed troffers for replacements or retrofits, specifically when it comes to how they are powered and connected to the electrical infrastructure. Troffers are usually powered by fluorescent ballasts that make contact at the ends of the lamp; the ballast is held in place by linear lamp-mounting brackets, also referred to as tombstones.

Manufacturers take different approaches to how they power linear SSL replacement lamps. Some use the fluorescent ballast, some use an onboard driver, and some replace the ballast with an external driver and rewire the tombstones—they mount and power the lamps with separate mounting brackets. In this last example lies the potential for trouble. By changing the assembly, which was designed for a fluorescent lamp-and-ballast relationship, there is the potential to compromise the UL listing as well as the possibility of creating unsafe electrical connections. As the CALiPER 11 report notes, "When the ballast is removed and replaced with a driver or with direct connection to 120VAC line voltage, the tombstones and associated wires are no longer operating as when wired for fluorescent lamps."

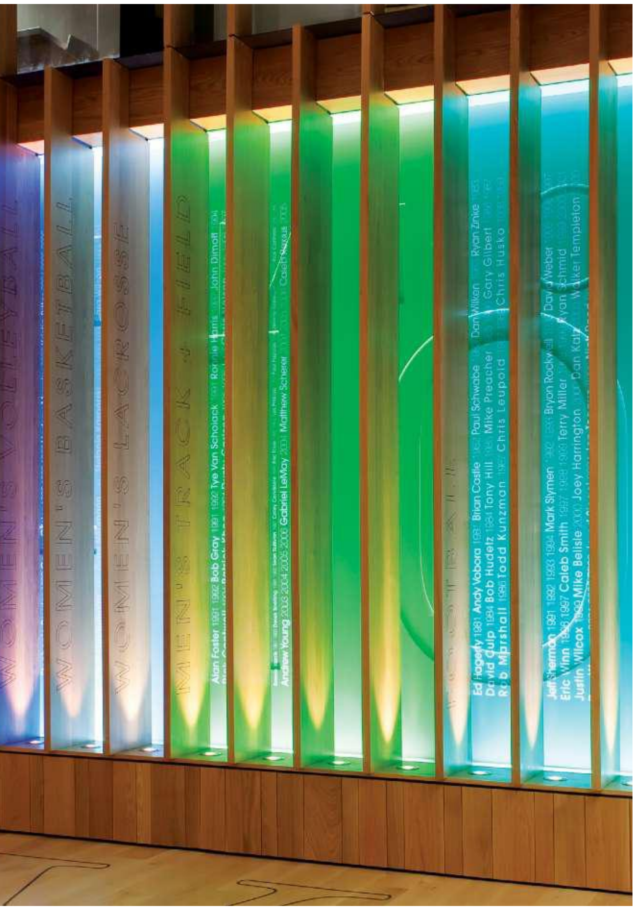
To date, most SSL linear lamps require the removal of the troffer ballast, and then input voltage enters the lamp from the pins at one end and passes through to the other end. Some manufacturers provide wiring and installation diagrams so that the installer will know how to remove the ballast and rewire the LED lamp, but most do not provide clear instructions about the rewiring requirements. Related trade groups, as well as safety and standard organizations, have provided preliminary feedback to the DOE, and CALiPER is working with the National Electrical Manufacturers Association, the Canadian Standards Association, and Underwriters Laboratory to create clear, informative guides for the selection, purchase, and installation of SSL linear lamps. •

AD INDEX

GREEN AND GOLD

A new academic center for student athletes scores performance with LEDs.

text by Mimi Zeiger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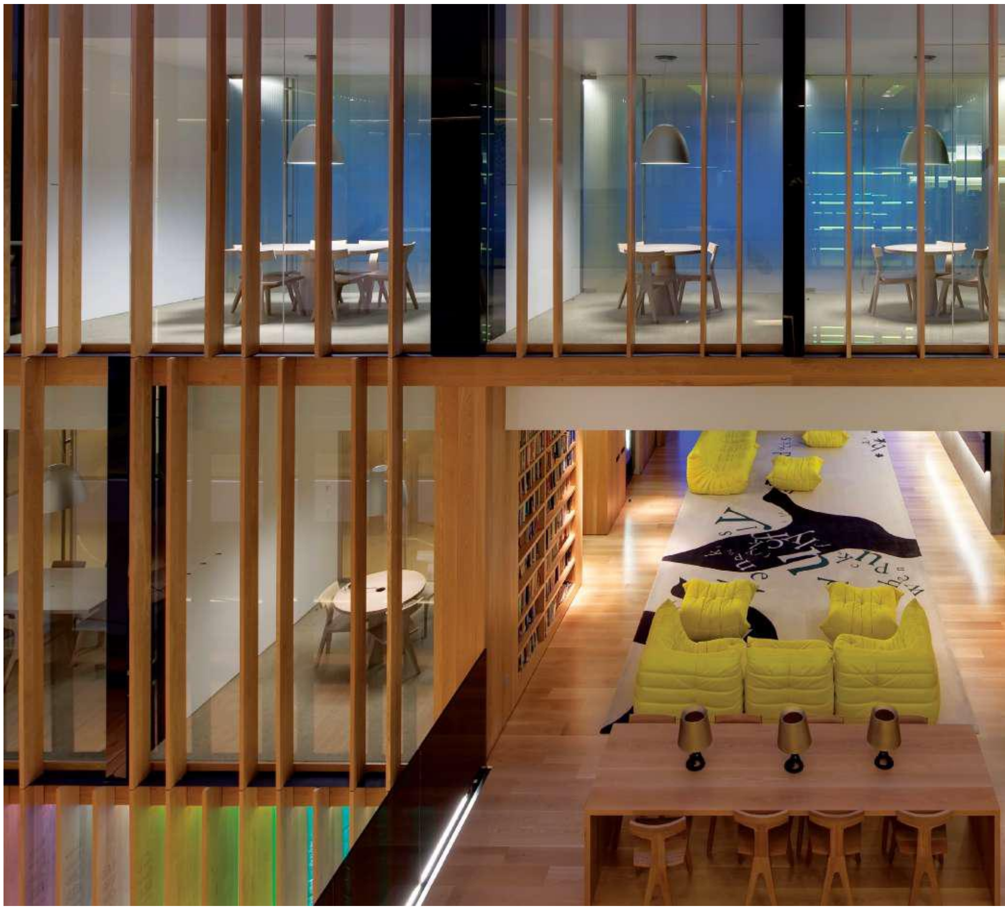
MEN'S TRACK & FIELD



The John E. Jaqua Academic Center for Student Athletes sits jewel-box–like at the edge of the University of Oregon's (UO) Eugene campus. ZGF Architects placed a perfect cube on a triangular plot of land that sits along a busy intersection at the northeast entry to the sprawling 295-acre campus. This location makes it an eye-catching icon for both students and the city's residents.

The design team conceived of the building as both a gateway to the campus and as a celebration of UO's athletic and academic prowess. It is a gathering place for the athletic community—a learning center for students and a lively space for alumni. The 40,000-square-foot glazed structure, which measures 125 feet long on each side, stands in contrast to the rest of the university's red brick building stock.

"The site is a joint between academics, athletics, and the housing," explains ZGF Architects partner and UO alum Gene Sandoval. "It's a neutral form. It's a pivot point for everything around it. The form is quiet, but it's a beacon in the evening. We thought the simplicity of this building is really enduring."

Phit LLC, a private group financed in part by Penny and Phil Knight—the latter being the Nike co-founder who ran track and field during his time at the university—served as the client and pushed the team's design. "We went to him [Knight] three times and every time he said it wasn't good enough. He'd say, 'Let's raise the bar,'" Sandoval recalls. "He felt that the athletes deserved something far better than he's seen around the country."

The center "is a celebration of past, present, and future," Sandoval says. And it's also "about getting the best academic care, because very few students are going to be pro athletes. It's about counseling and life skills—all the things you need as an athlete." As such, the three-story building has a café, a lobby, and a 114-seat auditorium, as well as 35 tutor rooms, a library, 40 study carrels, two flex classrooms, 25 offices, a computer, and three teaching labs.

The grand, 37-foot-tall public atrium allows UO to engage its student athletes as well as its active alumni community. As a result, the space is enlivened with artworks and installations that honor alumni athletes and donors.

ZGF, working with the lighting design studio at Portland, Ore.–based Interface Engineering, devised a richly integrated lighting scheme using LEDs to bring the nearly entirely transparent building to life. The design begins with the Jaqua Center's exterior façade, which is 85 percent glazed and is composed of a double-insulated glass curtainwall with a 5-foot-deep air cavity. Vertical stainless steel screens (composed of triangularly extruded wires) and operable rolling shades are set between the glass panels to control the amount of direct sunlight and heat gain.

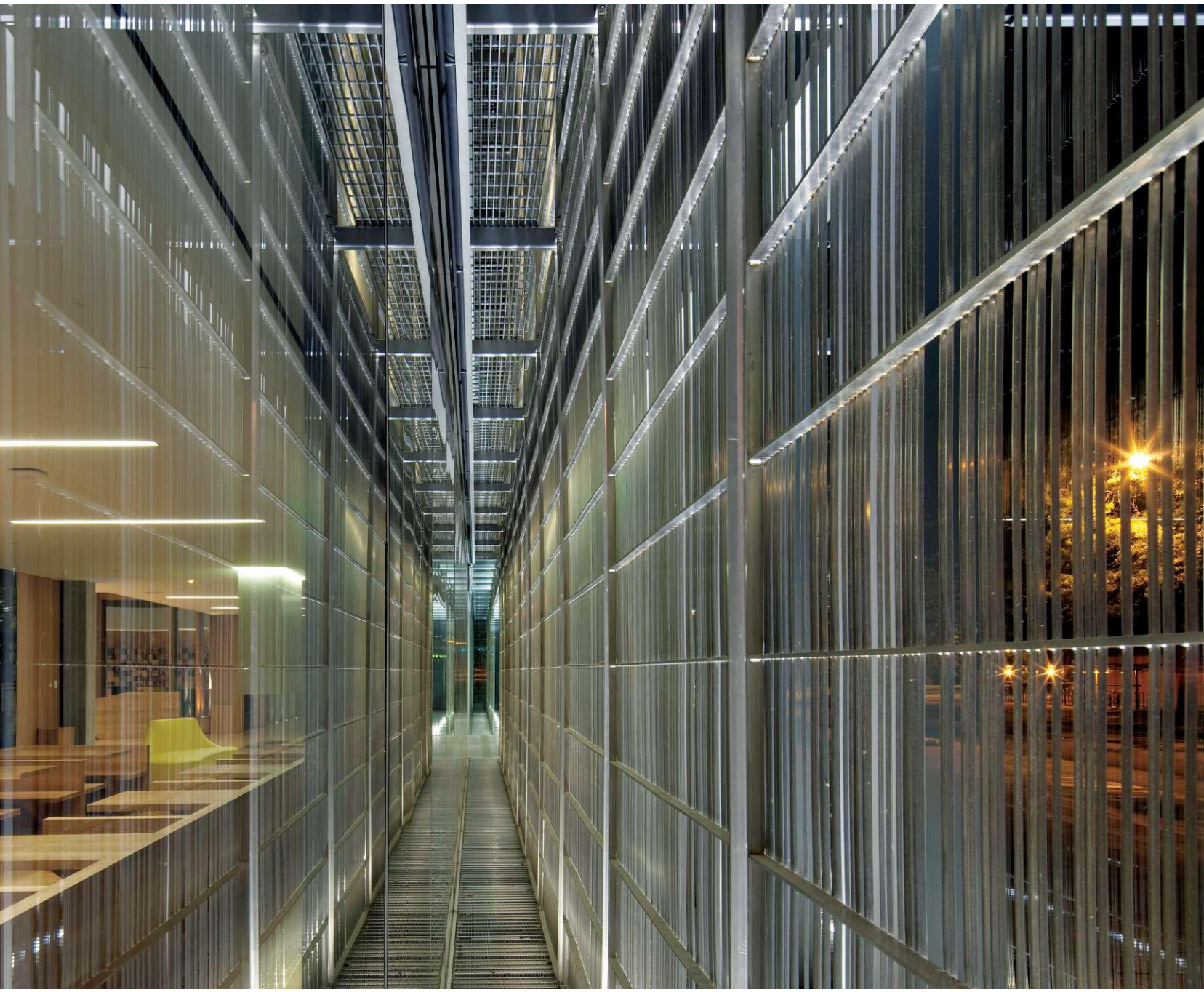
The lighting designers installed 15W-per-foot 4000K LED accent fixtures to graze the steel scrim with diffuse white light. They used LEDs instead of spotlights or fluorescents because of their ability to provide uniform and continuous light around the entire building. At night, the building radiates softly and the glow ripples in the reflecting pool that surrounds the structure.

Inside, the careful use of fluorescent lighting and LEDs balance the two facets of the center: its active public atrium on the ground floor and its quieter study spaces and teaching areas on the upper two floors. "At the beginning of the project our aim was to minimize distractions and reduce the presence of lighting in the study spaces, but … the other piece of the puzzle was to pay tribute to student athletes," recalls Mark Godfrey, senior lighting designer in Interface Engineering's lighting studio.

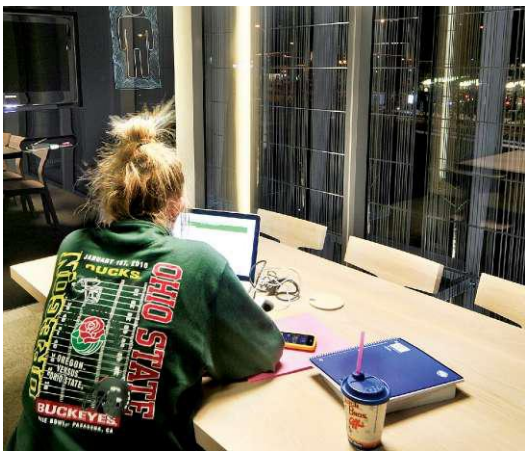
The atrium is home to a host of artworks and installations that go beyond the typical donor plaque. For instance, it's impossible to miss the three-story-tall image of Albert Einstein. The pixilated montage is composed of 10,000 small stainless steel panels etched with photographs of UO athletes. Because walkways cut through the composition, Godfrey's team needed a way to emphasize the whole picture. They designed a gigantic frame with 3W 3000K recessed linear LEDs mounted at the mural's edges, which created just enough brightness. (Spotlights would have reflected glare spots on the stainless steel and fluorescents run too hot for the tight profile application.

In the Jaqua Center's atrium (top right), LEDs illuminate the many artistic installations honoring the University of Oregon's student athletes and alumni. Each application is unique. The Pac-10 wall (top left) combines linear and spotlight fixtures, while the Einstein mural (bottom left) uses recessed linear LEDs along the artwork's edges. Color-changing LEDs in the auditorium (bottom right) bathe donor names in the school colors.

Steve Cridland (previous spread, this page top left and right, and bottom right); Basil Childers, courtesy ZGF Architects (bottom left)




OREGON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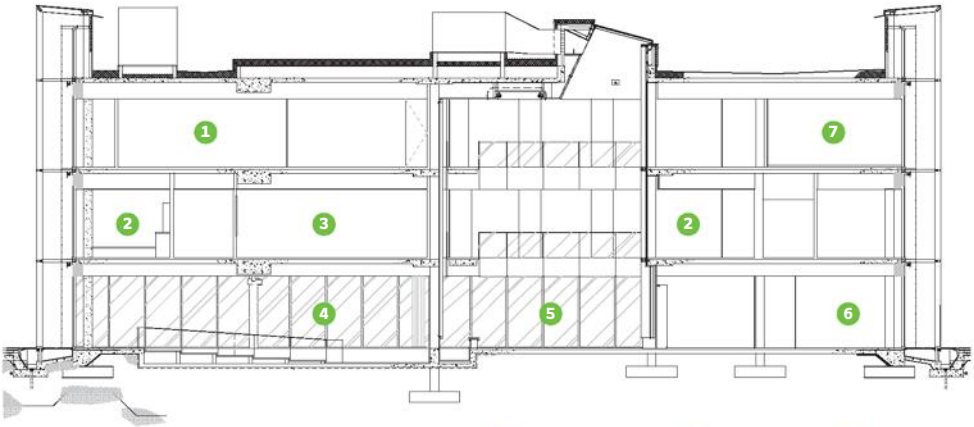

Building Section
East-West (looking North)
not to scale

1 Quiet study area
2 Tutor room
3 Classroom
4 Lecture hall
5 Atrium
6 Office
7 Computer lab

Across the atrium, the Pac-10 award exhibit features vertical fins (wooden on one side and mirrored on the other), plus colored glass panels on the back wall that list the names of distinguished alumni. The installation required two LED systems: linear 4000K LED luminaires (15W per 12 inches) with a 6-degree light pattern to highlight the letters set in relief, and a round, narrow LED uplight that recesses into the base of the wood cabinet to highlight the fins. The fixture is UL-listed for maintenance concerns and possible dampness (a mechanical plenum sits below the ground floor).

Finishes, furnishings, and lighting throughout the center follow the school's green-and-yellow color palette. In the atrium, adjustable RGB 50W LED color-wash fixtures tuck into skylight wells and into ceiling pockets. They run with the linear, tubular neonlike color-changing LEDs (10W per foot) in the glazed elevator shaft, so that there is a continual interplay between bright yellow and grassy green. In the auditorium, 28W miniature T5 fluorescents provide linear accent lighting along the window walls. Color comes from one row of 4100K LEDs that uplight a sheet of stainless steel, laser cut with donor names.

Interface Engineering's approach to the learning areas and offices was more subdued. Large-shaded custom 42W compact fluorescent pendants hang over study tables in the tutor rooms and simple task fixtures illuminate the library. Both the study carrels and office cabinetry are customized with built-in 28W T8 undercabinet fluorescents. Narrow-aperture 28W T5 recessed fluorescent luminaires are used in all of the corridors. All lighting is tied back to a master control system.

Oregon has one of the most progressive energy codes in the country, following the State Energy Efficiency Design (SEED) program, established in 1991. In addition, all state buildings must use 20 percent less energy on an annual basis than a similar building constructed to meet the Oregon Energy Code. The Jaqua Center's all-glass façade makes this even more difficult to meet. Occupancy sensors and photocells adjust for available daylight and usage. Motorized shades, mounted within the double skin, address visual glare and heat gain.

The design team also used EQuest energy-modeling software from the U.S. Department of Energy to define lighting zones, customize time of use, and create occupancy models. Using the software, the engineers determined lighting loads based not on an accounting of connected loads, which has been the de facto practice, but rather on usage in kilowatt-hours, which provides a more accurate reading of actual energy usage. By applying this model, Interface's engineers were able to fine-tune the center's performance. For example, the fluorescent corridor lighting is on programmable dimmable ballasts, and software keeps the energy loading at a maximum of 75 percent of the typical connected load.

With these efforts, the building comes in at 20 percent below the Oregon Energy Code. So for the whole design team, the project was a touchdown. •

The glowing façade comes from LED accent fixtures installed within the building envelope. Light grazes the elegant support structure and stainless steel screens. A 5-foot-deep air cavity within the glazed curtainwall (top) provides space for lighting and a series of operable rolling shades that help modulate direct sunlight and heat gain. Study areas and the café (bottom) are primarily daylit, with specific tasklighting.

Steve Cridland (top); Eckert & Eckert, courtesy ZGF Architects (bottom left and center); Ron Cooper, courtesy ZGF Architects (bottom right); Building section, courtesy ZGF Architects

Details

Project: John E. Jaqua Academic Center for Student Athletes, University of Oregon, Eugene, Ore.
Donor: Phil and Penny Knight, Portland, Ore.
Owner: University of Oregon, Eugene, Ore.
Architect: ZGF Architects, Portland, Ore.
Lighting Designer: Interface Engineering, Portland, Ore.
Interior Designer: Firm 151, Portland, Ore.
Project Cost: $41.7 million
Project Size: 40,000 square feet
Watts Per Square Foot: 0.998 watts (connected load)
Energy Code Compliance: Exceeds Oregon Energy Code; Exceeds Oregon State Energy Efficiency Design (SEED) program requirements; Energy model exceeds a code-minimum building by 9 percent; Lighting system operates at 25 percent to 50 percent below Oregon Energy Code

Manufacturers/Applications:

Artemide (custom pendants); **Axis** (egress lighting at stairwells); **B-K Lighting** (landscape path lighting); **Concealite Life Safety Products** (concealed egress luminaire); **Cooper Lighting Lumière** (exterior landscape lighting); **Cooper Lighting Fail-Safe** (emergency lighting); **Cooper Lighting Metalux** (back-of-house spaces); **Cooper Lighting RSA Lighting** (multiple lamp slot luminaire); **Cooper Lighting Sure-Lites** (egress and exit signs); **Deltalight** (linear LED); **Dreamscape Lighting Mfg.** (in-wall slot luminaire); **Edison Price Lighting** (square downlights); **Erco** (small linear fixture at open stair); **Focal Point** (general fluorescent lighting); **Gammalux Systems** (general fluorescent lighting); **Gotham Lighting** (CFL downlight, back-of-house spaces); **HessAmerica** (exterior path and parking lighting); **Hunza** (exterior path lights); **Hydrel** (interior LED uplights); **i-Led Solutions** (small LED "points" at restrooms); **Ingo Maurer** (custom fixture at deli counter); **Jesco Lighting Group** (niche, cove, furniture, and detail lighting); **Juno Lighting Group by Schneider Electric** (back-of-house spaces); **Lighting Services Inc.** (track, monopoints atrium downlights); **Linear Lighting** (general fluorescent lighting); **Lumux** (exterior utility luminaire); **Lutron** (Ecosystem and Quantum lighting control systems); **Osram Sylvania** (lamps throughout); **Philips Bronzelite** (tree uplights); **Philips Color Kinetics** (white and color-changing LED); **Philips Guth** (back-of-house spaces); **The Lighting Quotient** (indirect lighting open stair); **Tivoli** (exterior LED rope light); **WAC Lighting** (small downlights); **Zumtobel** (general fluorescent lighting)

Naomi Miller

interview by Elizabeth Donoff
portrait by William Anthony

"I think the lighting designer is going to find him- or herself relying more heavily on LEDs to replace some of the older tools in their toolbox. It's a matter of getting used to a new technology, and this one just happens to be more like learning electronics than learning lighting."

After having spent more than 30 years designing lighting projects, Naomi Miller is now approaching lighting from a different angle—that of technology development and application. In 2010, Miller closed her Troy, N.Y., lighting practice—Naomi Miller Lighting Design—and relocated to Portland, Ore., to join the team at Pacific Northwest National Laboratory. There, she uses her design experience to translate information about LED technology into terms that lighting designers and architects can understand, and at the same time to communicate to manufacturers what designers need. As a go-between, Miller is helping both communities navigate this new technology, which is redefining lighting design.

How are LEDs impacting lighting?
The toolbox that we have to work with keeps getting better; we have more options now.

Are LEDs under a different kind of scrutiny than other light sources?
Absolutely. We expect them to be as good as all other sources put together because we're looking at SSL as a replacement source.

How can the industry maintain good faith in this technology?
The best thing that manufacturers can do is to give us good-performance products that are really going to hold up over time.

What's a challenge in getting LEDs into application?
Installation. Manufacturer instructions are nowhere near as clear as they should be, especially regarding wiring. Electricians don't know how to handle this stuff; the wiring is different—constant current versus constant voltage. The drivers look the same, but when you blow an LED, it doesn't look any different. It's all part of the education, trying to get the manufacturer to listen to issues like that, because there are a lot of engineers who don't ever see the fixture installed.

Where do you see SSL heading?
Optics to reduce glare from bright LED sources, lamps and luminaires with a wider range of lumen outputs and beam spreads, easier dimmability of LED systems, and a way to distinguish between good and bad power supplies and drivers for different applications. •

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SMART BUILDINGS, SMART GRID

Energy-efficient lighting is an indispensable feature of the office of the future.

text by Gregg D. Ander

RMA Architectural Photography, Courtesy The Lighting Quotient

Glumac Engineering's Irvine, Calif., office is one of the facilities participating in the Office of the Future initiative (above).

Whether they are typing away in their cubicles, attending lengthy meetings, or snacking in the cafeteria, office workers don't generally wonder how the lights above their heads could save their organization money. Energy-efficient lighting is, however, an indispensable feature of the office of the future. Through careful design and with the integration of high-efficacy lamps, ballasts, and controls, office spaces can achieve a vastly superior luminous environment while saving substantial money and resources.

Utilities in the 21st century face significant challenges. Integrated systems and controls must be in place to deliver highly reliable service with quality results. Energy-efficient office spaces need to be reasonably priced to attract business owners. It's also important to question how a lighting design will affect the environmental quality of office buildings.

Policy makers recognize that greenhouse gases in the atmosphere—caused in part by heavy reliance on fossil fuels—will have major long-term global impacts, including rising sea levels, lowering air quality, and increasing ecological damage. Federal and state regulators who are aggressively promoting climate and energy policies recognize that smart buildings, when plugged into a sophisticated electricity grid, help reduce greenhouse gas emissions.

Energy-efficiency programs in the U.S. abound. Many utility companies offer consumers incentives for an array of technologies, technical analysis, and training to help facilitate market adoption and ultimately to reduce costs. Demand response programs, specifically, allow consumers or other third parties to operate and closely monitor energy consumption using smart meters, building area networks, and dashboards that allow connectivity and other monitoring functionality.

Those meters are just one tool in the smart grid, which can deliver electricity more

Studies have shown that employees with personal dimming controls registered higher ratings of overall satisfaction with their environment and were happier at work.

efficiently by boosting the coordination between suppliers, consumers, and networks in two-way or "N-way" digital communications. The smart grid restores the supply-and-demand balance by linking transmission lines with conventional electricity generators, rooftop solar customers, wind farms, plug-in electric vehicles, and distribution stations. Renewable-energy generation can have a significant impact on the grid's reliability, which is affected by intermittent power production or transient loads. Additionally, peak loads during the 9-to-5 workday are typically double that of off-peak loads from midnight to 6 a.m.

Zero-net-energy (ZNE) or ultralow-energy buildings also relieve the grid's load by harvesting energy on site with the goal of achieving zero- or low-carbon emissions. California's goal is to have zero-net-energy in place for new residential buildings by 2020 and for new commercial buildings by 2030. These goals may be reached through exemplary building design, highly efficient space conditioning, state-of-the-art lighting design, as well as by using solar electric or wind generation. These high-performance building features would be integrated through sophisticated controls.

THE MARKET

Lighting is so ubiquitous that we take it for granted. According to the California Energy Commission, lighting represents 42 percent of the electrical consumption in California—more than air conditioning, refrigeration, and ventilation. More than three-quarters of the total lighting load is nonresidential space and 26 percent of that is commercial.

There is a currently a glut in office space on the commercial market. According to the Urban Land Institute, the national downtown urban market space equals 1.5 billion square feet, while the suburban market equals 3.2 billion square feet. Less demand means rising vacancies, declining rents, and tenants who want more at less cost. Market trends in commercial real estate show little new development or money for retrofits. Instead, property management firms are increasingly specializing in niche markets such as green buildings.

According to the 2008 study "Does Green Pay Off?" by Norm Miller, Jay Spivey, and Andy Florance, LEED-certified buildings sold for 64 percent more while Energy Star–labeled buildings sold for 27 percent more. Studies have shown that employees with personal dimming controls registered higher ratings of overall satisfaction with their environment and were happier at work, according to a study by the Light Right Consortium. The general literature also suggests that green office spaces have the potential to lower worker compensation claims, increase productivity, reduce absenteeism, and lower vacancy rates. These trends make office spaces unique platforms for integrated lighting solutions.

SOLUTIONS

The Office of the Future (OTF), a consortium founded by Southern California Edison and other utilities, promotes an integrated technology and market-driven approach to lighting design and other building systems in commercial office spaces. The OTF combines two-way connectivity, off-the-shelf solutions, and careful design. Coupled with demand response, two-way connectivity empowers businesses to intelligently manage their energy use. If there is a transmission constraint, or issues on the distribution system, this connection allows businesses or third-party aggregators to control loads and reduce operating costs.

One of the foundations of the OTF is thoughtful design. Detailed assessments of how fixtures, ballasts, lamps, and controls are utilized during the workday help

dictate which solutions should be implemented and studied. Off-the-shelf solution packages make retrofits more economical and accessible.

The involvement of prominent stakeholders demonstrates how large the market is for the OTF. The consortium includes Microsoft, IBM, Trane, Consolidated Edison, Pacific Northwest National Laboratory, NSTAR, Sempra Energy, BC Hydro, National Grid, Pacific Gas & Electric Co., Sacramento Municipal Utility District, and others.

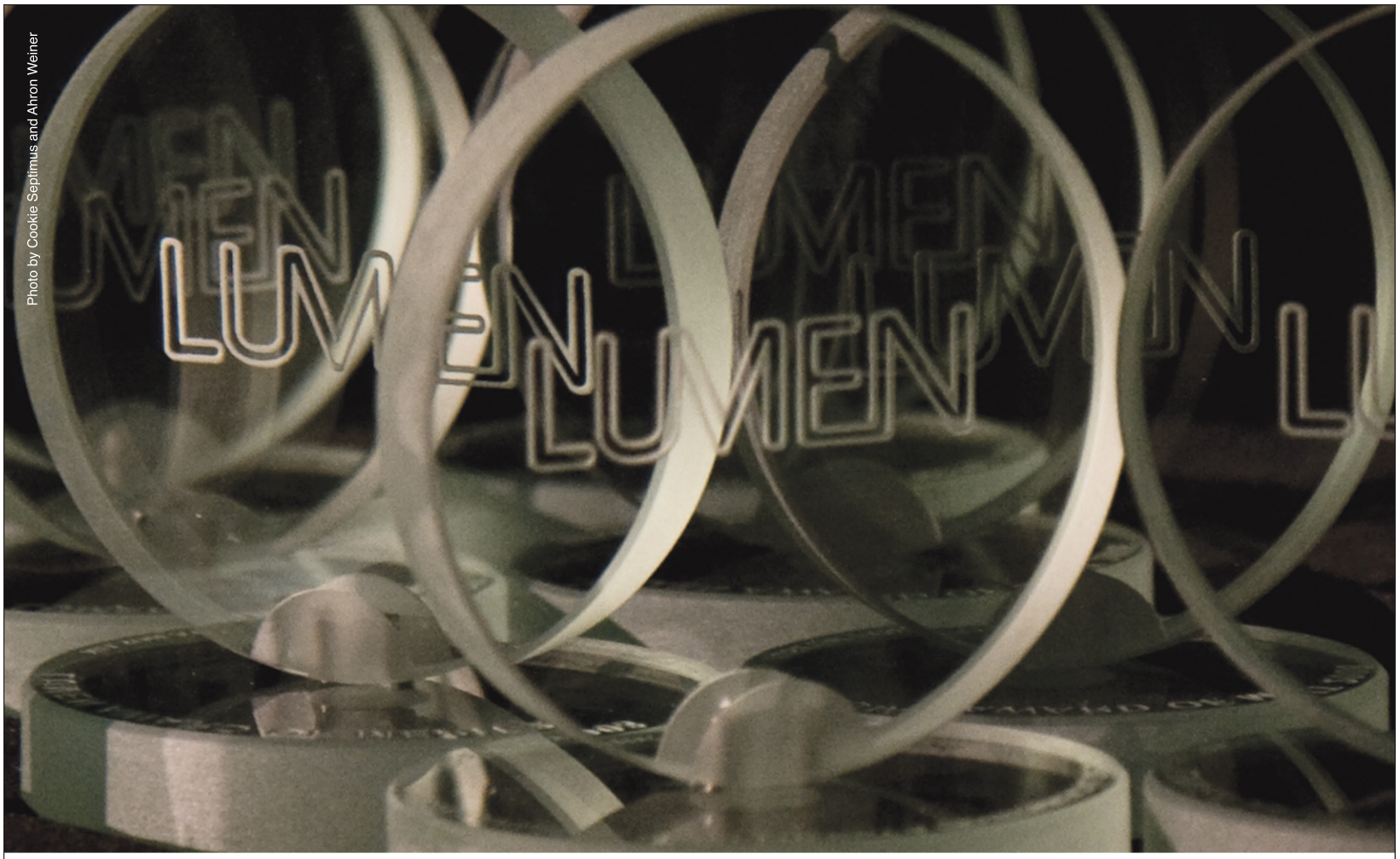
The consortium has already completed several successful pilots. One pilot project involved retrofitting a cube farm in an Irwindale, Calif., office building with a 1990s lighting system that used 1.2W per square foot. A suspended lighting system was installed, including dimming ballasts, Super T8 lamps, and small-zone occupancy sensing. The new system is demand responsive and set up to automatically respond to daylight. The redesign cut the watts per square foot in half and also reduced the annual energy cost by 74 percent.

Another SCE pilot project involved a redesign of executive office suites in Rosemead, Calif. The offices, which had been rebuilt in 1999, had incandescent lighting highlighting art objects, T8 U-lamps, and east-west facing windows. The beige-colored ceilings had less than 60 percent reflectance and the light levels were on average about 25 footcandles.

The office suites were outfitted with a range of design solutions including a sophisticated control system, pendant lights over desks, dimming ballasts at workstations, and daylighting controls. On-site instrumentation showed that the new designs dropped the watts per square foot from 1.84 to 0.64 while at the same time doubling the number of footcandles where needed. The instrumentation also verified a decrease in killowatt-hours per square foot per year from 8 to 3.

As these performance results demonstrate, careful lighting designs can substantially save energy costs and environmental resources. Similar pilots are planned, over the next year, for other parts of the country through OTF partners to demonstrate technologies and expose stakeholders to these concepts.

Making smart office spaces with superior luminous environments the norm means increasing connectivity at all levels. Building owners and decision-makers who are demanding higher-performance buildings must be provided with thoughtful solutions that include two-way high-fidelity controls and connectivity. The design community must also be prepared to provide such services to building owners, real estate developers, and others who are eager to take advantage of incentives or rates that are currently available or under



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development. This effort is made easier by the fact that dimmable ballast costs are dropping (in some instances by as much as $40) and new control requirements are being introduced into energy codes

One significant challenge is that designers, contractors, engineers, and others often lack the specific, detailed training needed to install some advanced control systems. Programs have recently been rolled out by the U.S. Department of Labor, however, that will train electricians on how to install sophisticated lighting-control systems (See "How to Light the Office of the Future," right.) With all of these efforts, high-quality, energy-efficient lighting can become a permanent fixture in every office building. •

Gregg D. Ander, FAIA, is the chief architect at Southern California Edison. He serves on the board of directors of the Sustainable Buildings Industry Council, the New Buildings Institute, the Collaborative for Higher Performance Schools, and the California Commissioning Collaborative. He is the author of Daylighting Performance and Design *(Wiley, 2003).*

How to Light the Office of the Future

Advanced Lighting Control (ALC) systems are fundamental features of smart buildings. Switching off lights in unoccupied offices, conference rooms, and toilet rooms during normal business hours can yield energy savings of up to 40 percent in commercial buildings. A system of dimming ballasts, occupancy sensor photocells, and communication-based devices will reduce the lighting load and help to develop Smart Grid infrastructure.

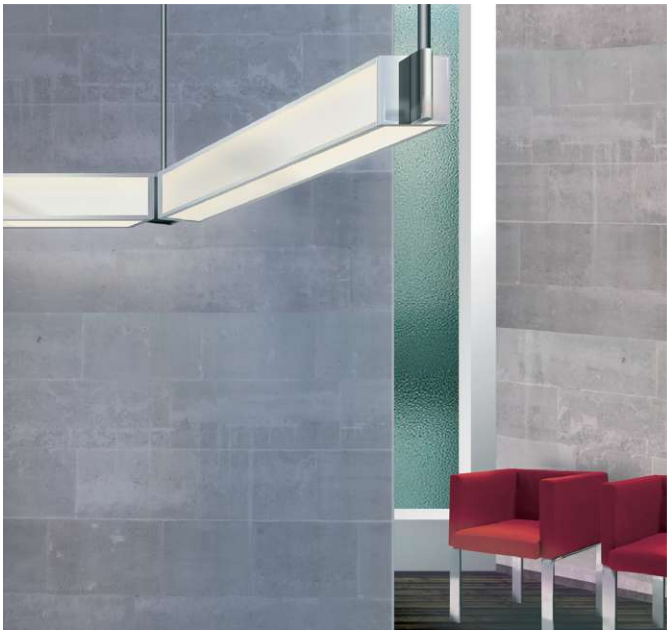
That kind of innovative design has been stymied by the fact that installers, designers, electricians, and contractors often lack the specialized training necessary to put those systems in place. As a result, architects and engineers often steer clients away from ALC systems that can improve light quality and productivity.

A bold California initiative aims to address that challenge from within the industry. The California Advanced Lighting Controls Training Program (CALCTP) was created to promote the design, installation, and commissioning of ALC systems in commercial buildings by advancing the training and certification of contractors. The idea is based on the principle that market transformation is best achieved through industry organizations and shared standards and practices. The CALCTP team includes investor-owned and municipal utilities, the International Brotherhood of Electrical Workers, the National Electrical Contractors Association, the California Lighting Technology Center, the University of California at Davis, community colleges, manufacturers, and ICF International.

The technical and sales trainings—to be held at 30 sites in California—will include both classroom and hands-on lab training on everything from dimming ballasts to high performance T8 lighting systems and Web-enabled controls. There are strong incentives for unions and businesses to go through the training. The CALCTP's partner utilities, equaling more than 90 percent of the California market, encourage contractors and electricians to be certified in ALC installations.

A rise in the number of highly skilled ALC installers promises to spur an upsurge in the supply and demand for lighting controls, while also creating new green jobs for the state. A recent summit at the University of California at Berkeley on employment in the green economy promoted such training efforts as a boon to California's economy and the environment. "Green technologies will not flourish without a well-trained technical and supporting labor force," according the summit's website—irle.berkeley.edu/vial. "There is potential for a 'win-win-win' strategy in this growing facet of California's economy, but it will require careful strategies, educational efforts, and coalitions."

The CALCTP's stakeholders believe their coalition is well positioned to spur that kind of market transformation and become one of the most momentous lighting initiatives in decades. *—G.A.*



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text by Meghan Smith

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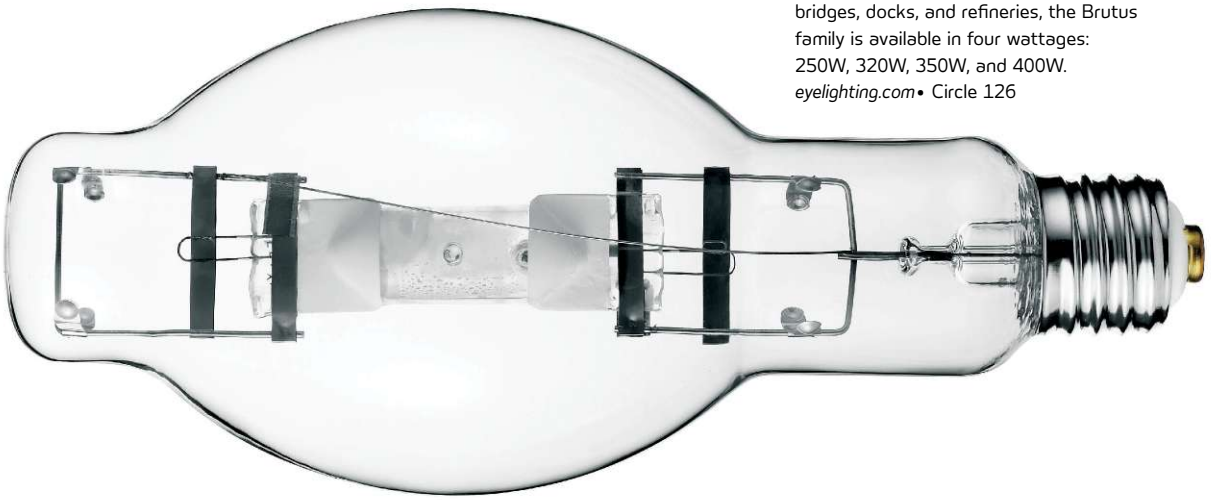
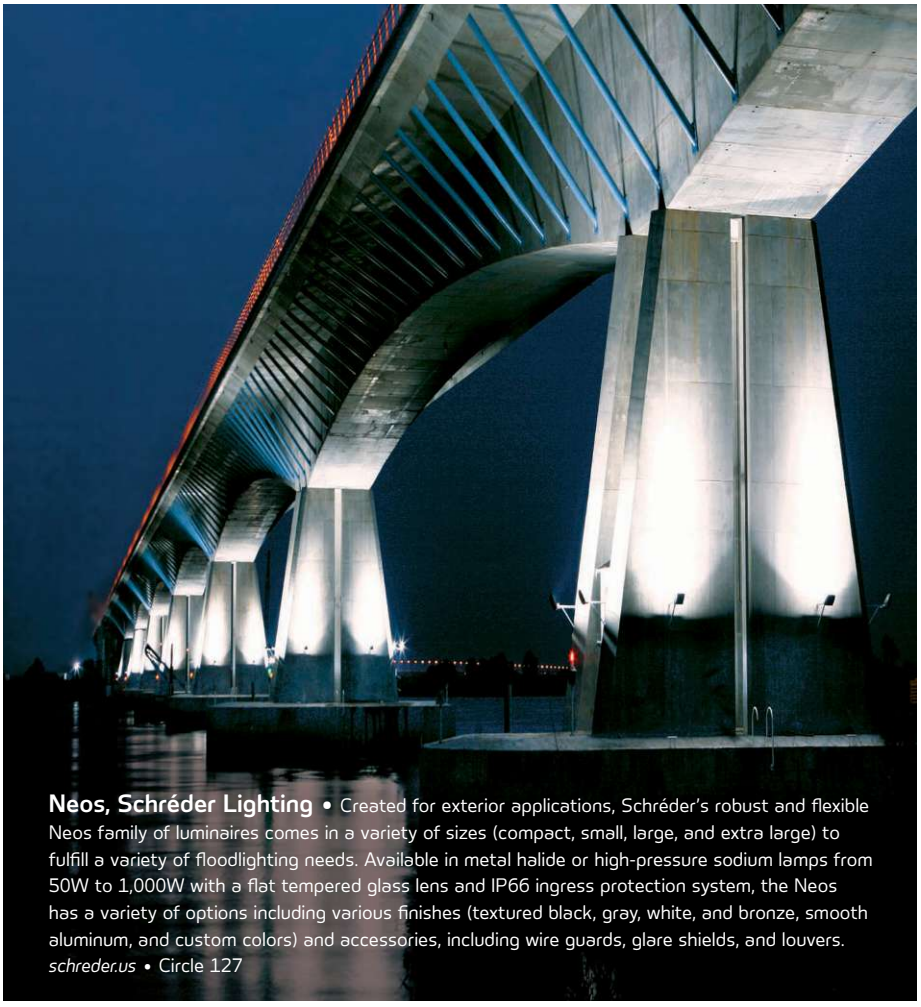
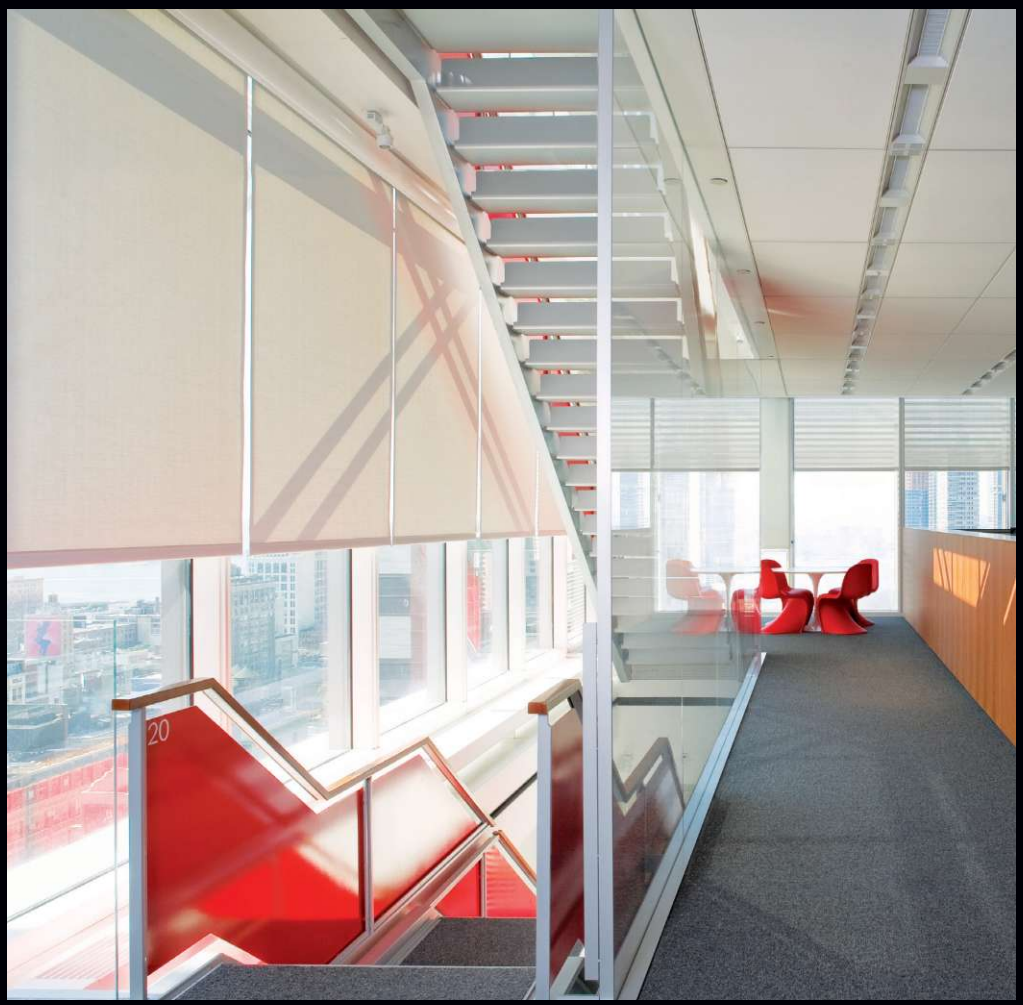




Neos, Schréder Lighting • Created for exterior applications, Schréder's robust and flexible Neos family of luminaires comes in a variety of sizes (compact, small, large, and extra large) to fulfill a variety of floodlighting needs. Available in metal halide or high-pressure sodium lamps from 50W to 1,000W with a flat tempered glass lens and IP66 ingress protection system, the Neos has a variety of options including various finishes (textured black, gray, white, and bronze, smooth aluminum, and custom colors) and accessories, including wire guards, glare shields, and louvers. *schreder.us* • Circle 127

Hi-Glo, Landscape Forms • The pedestrian Hi-Glo cast-aluminum luminaire, designed for outdoor walkways, provides a 3700K warm-white light with a replaceable LED cartridge consisting of 48 Cree XRE 1.3W LEDs. With a height of 12 feet and a fixture head measuring 33 ½ inches long by 25 inches wide, the Hi-Glo offers a dimmable LED driver, twist-lock receptacle for a photocell, and a BUG rating of B1U1G1 to reduce glare and light pollution. Part of a full suite of outdoor street furnishings that includes seating and signage, a companion Lo-Glo bollard is also available. *landscapeforms.com* • Circle 125

Shades up, lights down.



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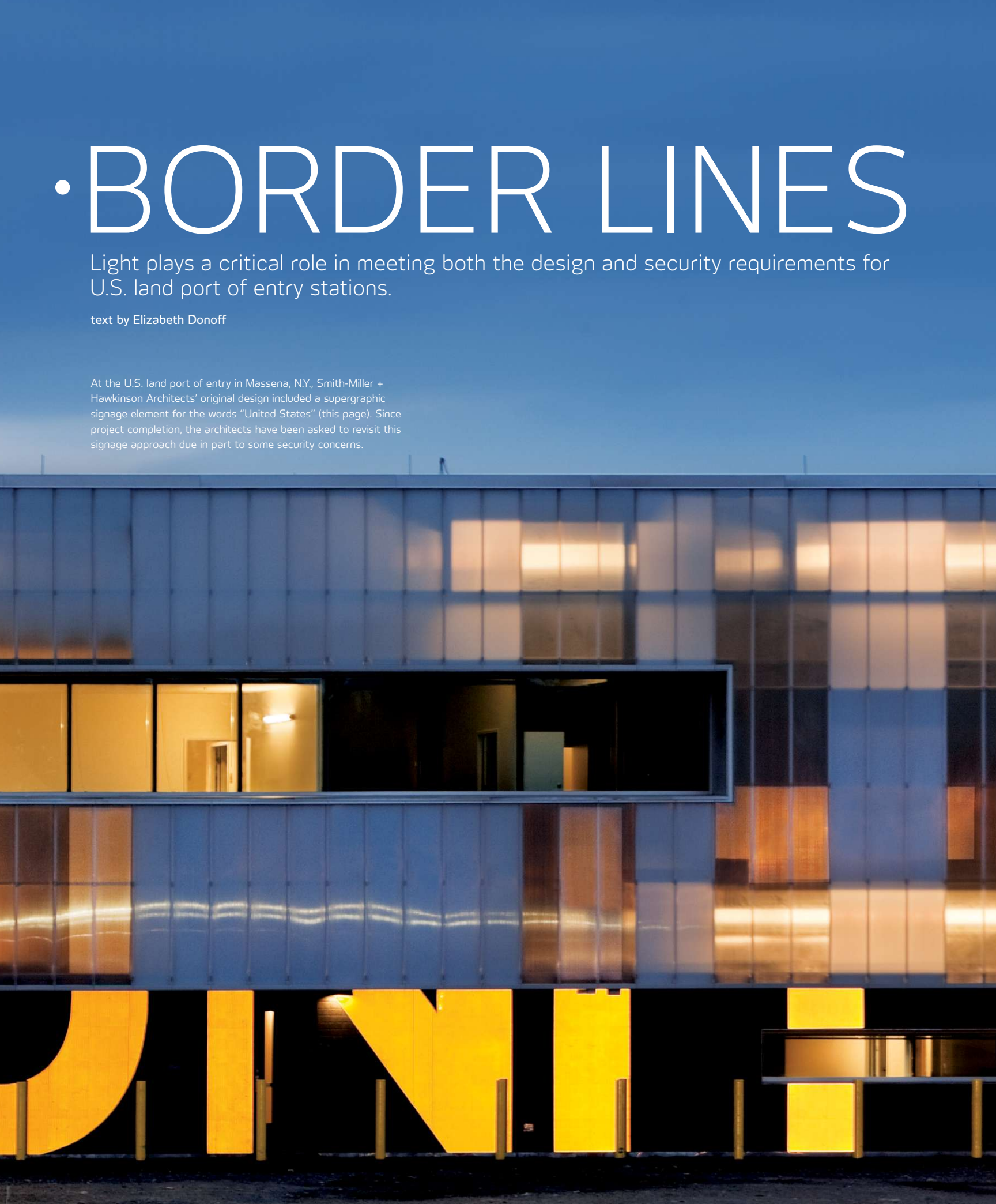
The New York Times Building, New York City, architecture: Renzo Piano Building Workshop with FXFowle Architects; architectural interiors: Gensler

BORDER LINES

Light plays a critical role in meeting both the design and security requirements for U.S. land port of entry stations.

text by Elizabeth Donoff

At the U.S. land port of entry in Massena, N.Y., Smith-Miller + Hawkinson Architects' original design included a supergraphic signage element for the words "United States" (this page). Since project completion, the architects have been asked to revisit this signage approach due in part to some security concerns.



An entrance and a barrier; welcoming but protective. These are some of the dualities that exist in considering a very specific type of project—land ports of entry (LPOE), commonly known as border-crossing stations. The security issues in this post-9/11 world pose new challenges. How does the United States construct an infrastructure of arrival points, where "huddled masses yearning to breathe free" are still invited to enter, but that also serve as a line of protection? LPOE facilities are organized into a complex set of spatial geometries that are coordinated with a highly choreographed set of procedures. These procedures are in place, first and foremost, to protect customs and border agents who often have to make split-second decisions in determining if there is a potential threat.

Light plays a particularly key role here, not just in the experience of these places, but in facilitating an agent's ability to do his or her job. The demands placed on the lighting are somewhat contradictory: Deliver a great amount of light and minimize brightness and glare—all while meeting significant security criteria, energy-code requirements, and sustainable building practices as mandated by the U.S. General Services Administration (GSA). But it is not an impossible task. The GSA's Design Excellence Program, which oversees the construction of LPOEs, recognizes the need for design to be integral to a project's development and enables even high-security environments to receive thoughtful architecture and lighting. In the process, particularly with some of the most recent LPOEs, lighting criteria have been revisited and new standards have been created that meet the priority of security, but do so in a way that creates a better overall environment, one that is securely illuminated.

•Massena

Smith-Miller + Hawkinson Architects reworked the building adjacencies and roadway layout so that the Massena Land Port of Entry would be better situated on the site (right). The canopies at the passenger inspection plazas work as a reflective lighting device to provide even illumination across the area (above).

The land port of entry at Massena, N.Y., is situated along the U.S.-Canada border amid complex site conditions that include the St. Lawrence River, Cornwall Island (home to the Akwesasne Reservation), and a series of wetlands. Site, movement, and light, along with security requirements, contributed to Smith-Miller + Hawkinson Architects' (SMH+) winning design scheme, the result of an invited GSA design competition in 2000. After 9/11, the project was put on hold and did not start up again until 2005. In the interim, with new security concerns on the table, the project requirements were reevaluated.

The main administration building, which houses offices and anchors the passenger- and commercial-inspection areas, is the first structure visible on the approach from Canada. Because this façade is north-facing and always in shadow, SMH+ wanted to integrate architectural details and light so that the building would emerge as a welcoming beacon on the horizon. Originally, supergraphic letters in a yellow Dept. of Transportation reflective sheeting spelled out the words "United States." The signage, seen in the photo at the right, has since been removed, due in part to some security concerns, and SMH+ is now working on an alternative solution with the GSA.

To meet the LEED Silver certification target yet still provide the 100 footcandle light level required for security purposes, SMH+ relied on architectural forms and natural light for an indirect lighting solution at the passenger vehicle-inspection areas' canopies.

Extremely thin and devoid of any equipment so as not to interrupt the white planar surfaces, the underside of the canopy serves as a light reflector. During non-daylight hours, 250W metal halide uplights, recessed on top of the inspection booths, are aimed at the canopy underside and supplement the even wash of light across the inspection bays, preventing harsh shadowing. In the secondary inspection area, pole-mounted metal halide uplights allow the U.S. Customs and Border Protection officers to perform their inspection duties. "It's a significant design challenge," says architect Sean Gallagher. "Architecture can participate with the operations that are happening at the borders in a way that will make the port run more smoothly and the experience a little bit more sane."

Details

Project: U.S. land port of entry, Massena, N.Y.
Completion Date: Fall 2009 (completed ahead of schedule)
Client: U.S. General Services Administration
Architect: Smith-Miller + Hawkinson Architects, New York
Structural, MEP, Civil, and Security Engineers: Arup, New York
Landscape Architect: Quennell Rothschild & Partners, New York
Environmental Consultants: Barton & Loguidice, Syracuse, N.Y.
Curtainwall Design Consultants: R.A. Heintges Associates, New York
Lighting Designer: Claude R. Engle, Washington, D.C.
Environmental Graphic Design Consultants: Pentagram, New York
Project Cost: $54 million (bid $4 million under budget)
Project Size: 57 acres (campus); 24,500 square feet (inspection plazas—booths and canopies); 37,200 square feet (M-Bldg, administration facility); 6,700 square feet (S-Bldg, secondary inspection facility); 7,900 square feet (G-Bldg, broker offices); 7,700 square feet (N-Bldg, non-intrusive inspection facility)
Energy Code Compliance: ASHRAE 90.1-2004
Photography: Michael Moran

•Peace Arch

Overlooking Semiahmoo Bay, the Peace Arch U.S. Land Port of Entry seamlessly blends in with the surrounding landscape at this crossing point between Blaine, Wash., and Surrey, British Columbia (above).

Situated along a thin slice of land overlooking Semiahmoo Bay and the international Peace Arch Park, the Peace Arch U.S. Land Port of Entry (LPOE) is one of the busiest northern border crossing stations serving private vehicle traffic between Washington state and Vancouver, British Columbia, Canada.

The design feature of the new port is its long, linear roof, a symbolic gesture to the border. "The challenge was to figure out how to incorporate this much-larger new facility in this very constrained spot," explains Sergei Bischak, project manager at Bohlin Cywinski Jackson.

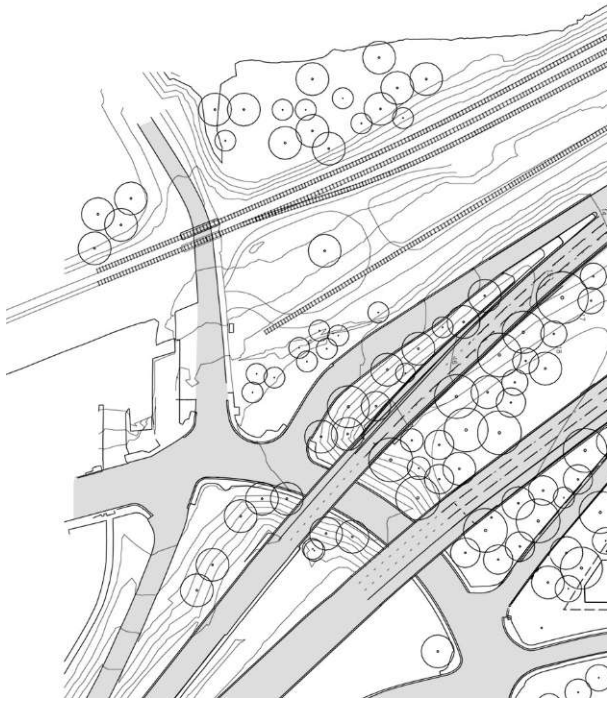
Because of the busy nature of this location and its 24/7 operation, the station could not be shut down for construction, so a phased approach was applied to demolishing the existing 1970s structure and erecting a new one in its place. Although there are now 10 lanes of traffic—two more than the previous facility had, according to Bischak—the project wasn't about "places for more cars." It was about "facilities to support the processing."

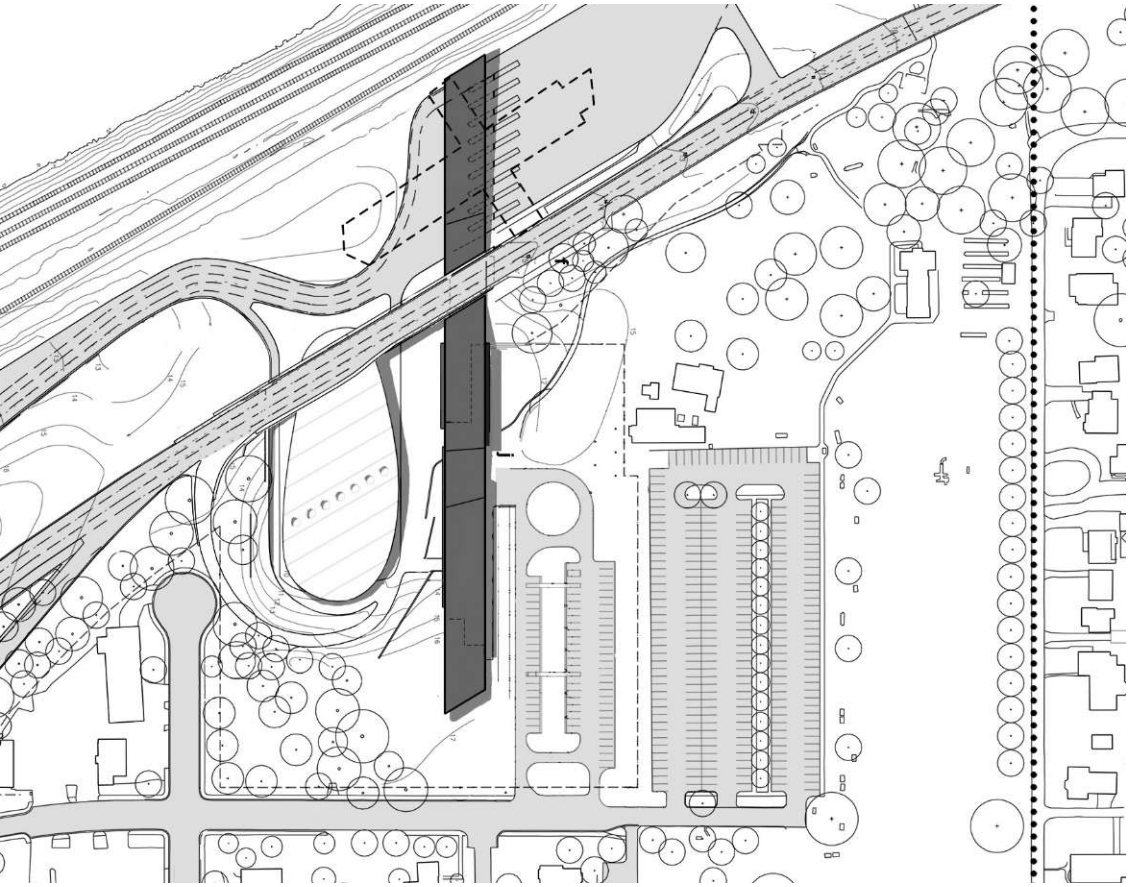
One of the most substantial developments resulting from this project was the creation of a new set of exterior lighting standards. As the team, which included Seattle lighting design firm Candela, began to work, it was clear that the existing GSA lighting guidelines were outdated and called for calculation methods that were not useful. Lighting designer Mary Claire Frazier, then a principal at Candela (she has since retired), spearheaded a request to the GSA to revisit the document. She proposed a tour of several LPOEs along the northern and southern U.S. borders so that Candela could analyze existing lighting conditions, interview U.S. Customs and Border Protection (CBP) agents, and then make recommendations for new lighting guidelines.

After extensive review, the GSA and CBP accepted the new findings, which better address vertical illuminance, uniformity, transition and adaptation zones, and glare control. Also of note in the new standard is the stipulation to include an independent lighting designer on all design teams. "The guidelines are written from a lighting designer's perspective," says senior lighting designer Randy Fisher. "Security issues are met, but with appropriate gradients of light."

Site Plan

N→





Details

Project: Peace Arch U.S. Land Port of Entry, Blaine, Wash.
Completion Date: January 2011
Owner: U.S. General Services Administration
Architect: Bohlin Cywinski Jackson, Seattle office
Structural and Civil Engineers: Magnusson Klemencic Associates, Seattle
Mechanical Engineers: CDi Engineers, Seattle
Electrical Engineers: Sparling, Seattle
Landscape Architect: Swift Company, Seattle
Lighting Designer: Candela, Seattle
Project Size: 15 acres (campus); 35,750 square feet (building); 55,000 square feet (site work)
Energy Code Compliance: ASHRAE 90.1-2004
Based on Candela's U.S. LPOE Design Guide Exterior Lighting Study, 289 fewer luminaires were used than the existing 2006 standards would have prescribed. The project also uses 16,773 fewer watts, a 22 percent reduction in total lighting load.
Rendering and Plan: Courtesy Bohlin Cywinski Jackson

•San Ysidro

As the busiest U.S. land port of entry, the facility at San Ysidro, just outside of San Diego, processes 102,000 people crossing between the U.S. and Mexico each day, by foot and by car. The new facility incorporates 34 northbound lanes of traffic (above) and a separate zone for pedestrians (right).

Lighting was a major element from the very start for the redesign of the San Ysidro U.S. Land Port of Entry (LPOE), just outside San Diego. When the Miller Hull Partnership (MHP) was called in for its interview with the GSA after making the short list of architecture firms, it was suggested to them that one of the five team members to include be the lighting designer. "We knew immediately how important lighting design was to the project," says Craig Curtis, design partner at MHP. "Fortunately, we had already decided to team with Candela who we've worked with for years. And coincidentally they had just done a study of LPOEs' lighting design."

As the busiest LPOE in the U.S., there are a tremendous number of demands placed on this facility, and even more since it is a border station along the nation's southern border. An extraordinary number of people—102,000—go through this location every day, 25,000 merely on foot. "The design first of all had to respond to the demand for increasing throughput," Curtis explains. "In addition to that, every architectural move we were making, we were trying to see what we could do in terms of sustainability as part of that same solution."

Striving to be a net-zero energy building and targeting LEED Platinum certification, multiple conservation systems are being put into place. For example, photovoltaic panels will be incorporated into the roofs of the administrative buildings as well as the edge of the primary canopy, one of the project's main design features.

The 780-foot-long canopy is supported by four 100-foot-tall structural masts. The masts also allow luminaires to be incorporated so that light washes across the inspection areas, which follows the new GSA lighting standards. The canopy itself serves as a light diffuser thanks to the translucent qualities of its ethylene tetrafluoroethylene material. As Curtis says, "We approached it [the project] from the very beginning knowing that we wanted this to be a beautiful structure, one that the U.S. is proud of as an entrance to our country." •


OF ENTRY
OPEN
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STOP
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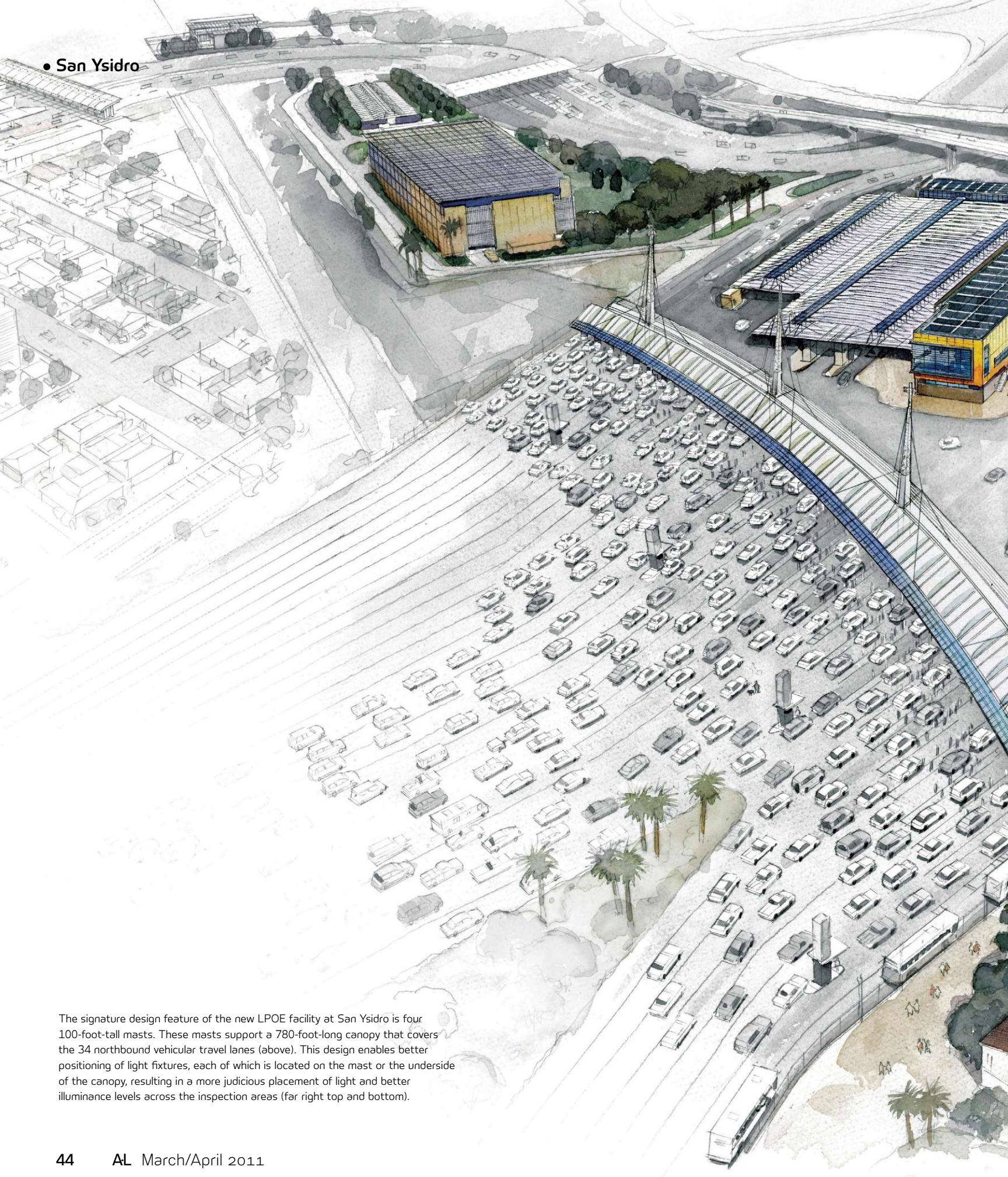
S OG 6219

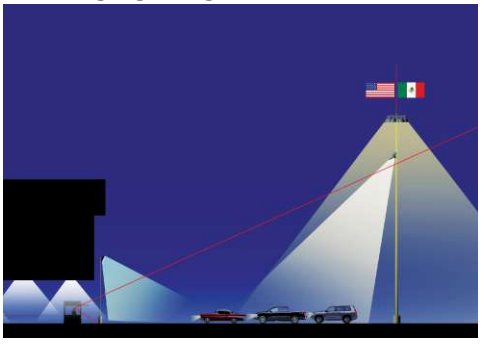


The signature design feature of the new LPOE facility at San Ysidro is four 100-foot-tall masts. These masts support a 780-foot-long canopy that covers the 34 northbound vehicular travel lanes (above). This design enables better positioning of light fixtures, each of which is located on the mast or the underside of the canopy, resulting in a more judicious placement of light and better illuminance levels across the inspection areas (far right top and bottom).

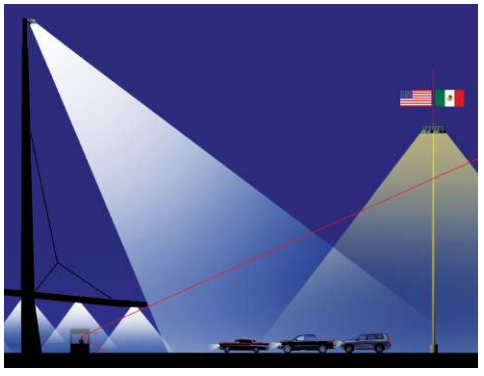
• Details

Project: U.S. land port of entry, San Ysidro, Calif.
Start Date: Broke ground March 2011
Client: U.S. General Services Administration
Architect: The Miller Hull Partnership, Seattle and San Diego offices
Structural and Civil Engineer: Magnusson Klemencic Associates, Seattle
Mechanical and Electrical Engineer: Interface Engineering, Portland, Ore.
Lighting Designer: Candela, Seattle and San Diego offices
Landscape Architect: AECOM, Los Angeles
Project Cost: $160 million for Phase 1; $577 million for all 3 Phases
Project Size: approx. 90,000 square feet (buildings); approx. 85,000 square feet (canopies)
Watts per Square Foot: Interiors are approximately 23 percent below code. 8.28W per square meter (current design); 10.76W per square meter, LPA (police/fire category); Exteriors are approximately 3.5 percent below code, including tradable and non-tradable spaces and including exempt lighting under the "Zone 3" category.
Energy Code Compliance: ASHRAE 90.1-2007
Renderings: Courtesy Miller Hull; Courtesy Candela (below)

Existing lighting conditions



New lighting conditions




BOYS

POOL ON THE WATER

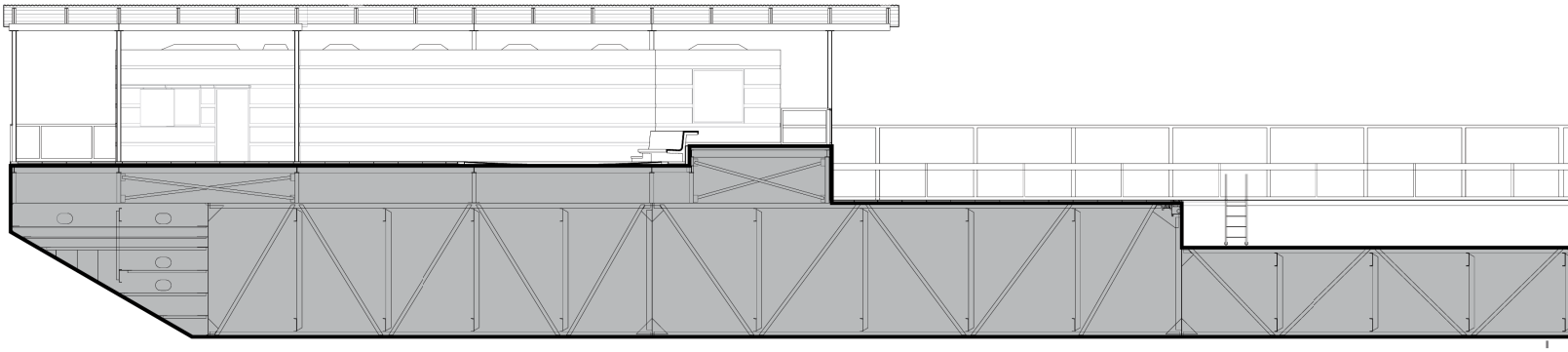
Tillett Lighting Design's scheme for a public pool—on a barge floating on New York City's rivers—keeps views open to the surrounding cityscape.

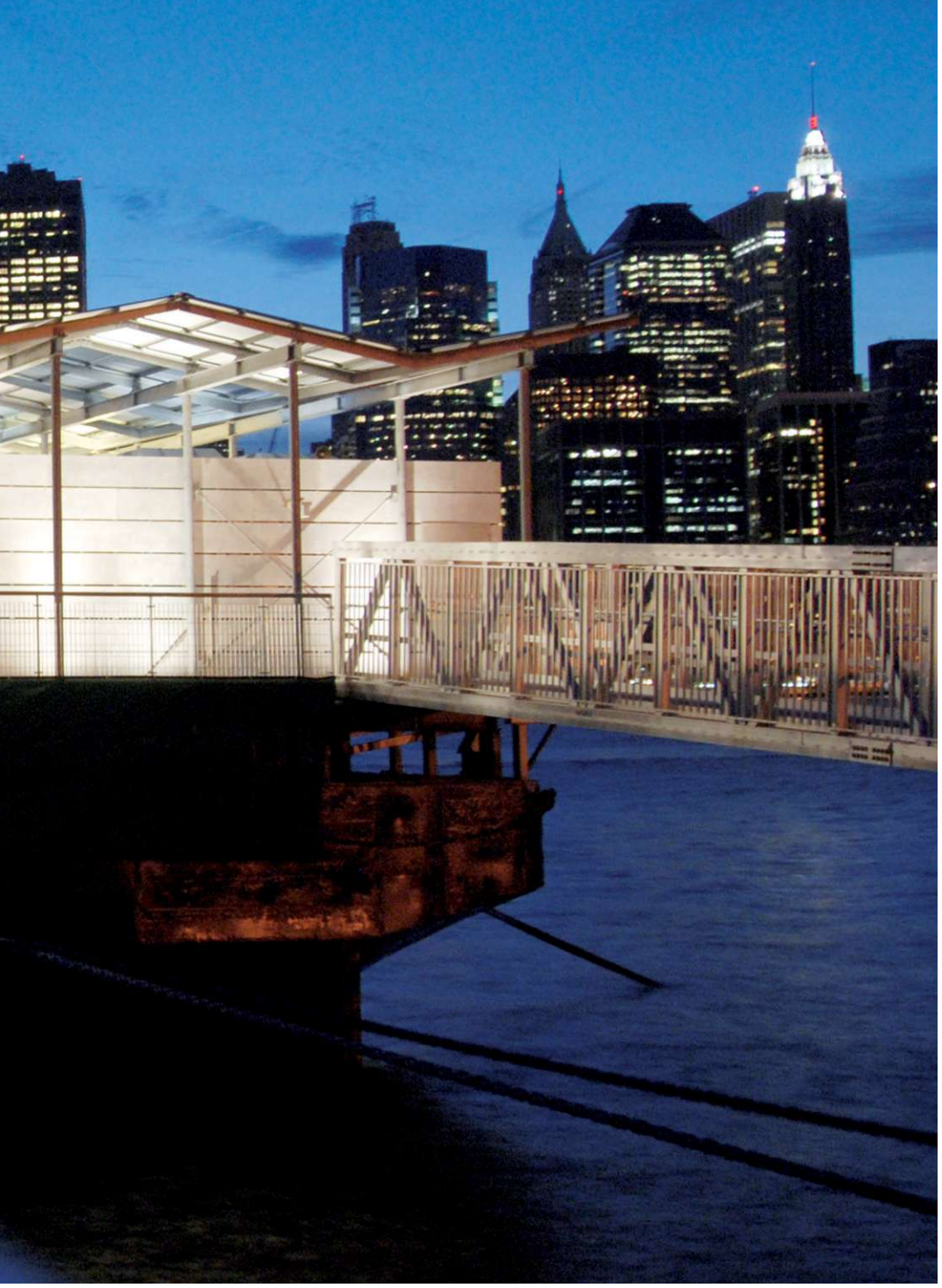
text by Aaron Seward

Developing an electric lighting scheme for the Floating Pool Lady, a barge that is home to a public swimming pool that migrates to different New York City waterfront neighborhoods each summer, meant keeping light levels low enough to maintain views of the city, while still satisfying the code requirements for public outdoor assembly spaces.

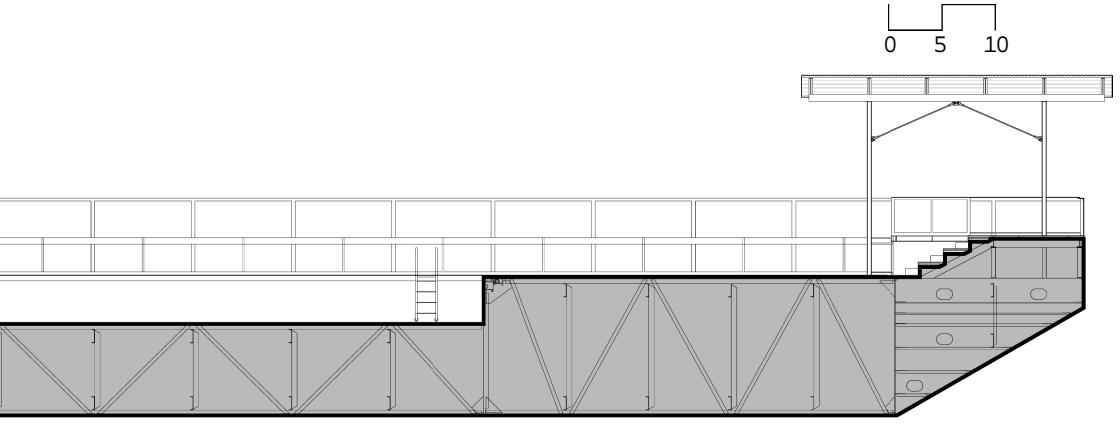
Uplighting grazes vertical surfaces and reflects off of a corrugated steel canopy, providing indirect illumination for the reception area, changing rooms, and snack bar (above). The pool was installed on a retrofitted cargo barge (below) that formerly plied the waters of the Mississippi River.

Longitudinal section through pool barge





Timothy Schenck (previous spread); Philippe Baumann (top); Section courtesy Jonathan Kirschenfeld Architect



Beginning just after the Civil War, residents of New York City were availed of a unique recreational opportunity: 15 floating bathhouses moored on piers in the Hudson and East rivers. These baths featured 90-foot-long by 60-foot-wide decks floating on pontoons, in the middle of which were 4½-foot-deep wells filled with river water. They offered citizens the chance to get closer to nature without falling prey to the waterways' frightening depths and aggressive currents. But the area's rapid industrialization and its consequent environmental degradation took its toll on these aquatic sanctuaries. By the 1940s, they were no longer in existence.

In 2007, the city saw the opening of the Floating Pool Lady, a public pool built on a 260-foot-long decommissioned barge moored in the East River just south of the Brooklyn Bridge in the Brooklyn Heights neighborhood. Donated to the city by the Neptune Foundation—and designed by Jonathan Kirschenfeld Architects with a lighting scheme by Tillett Lighting Design—the pool proved popular, hosting more than 50,000 swimmers in its inaugural season.

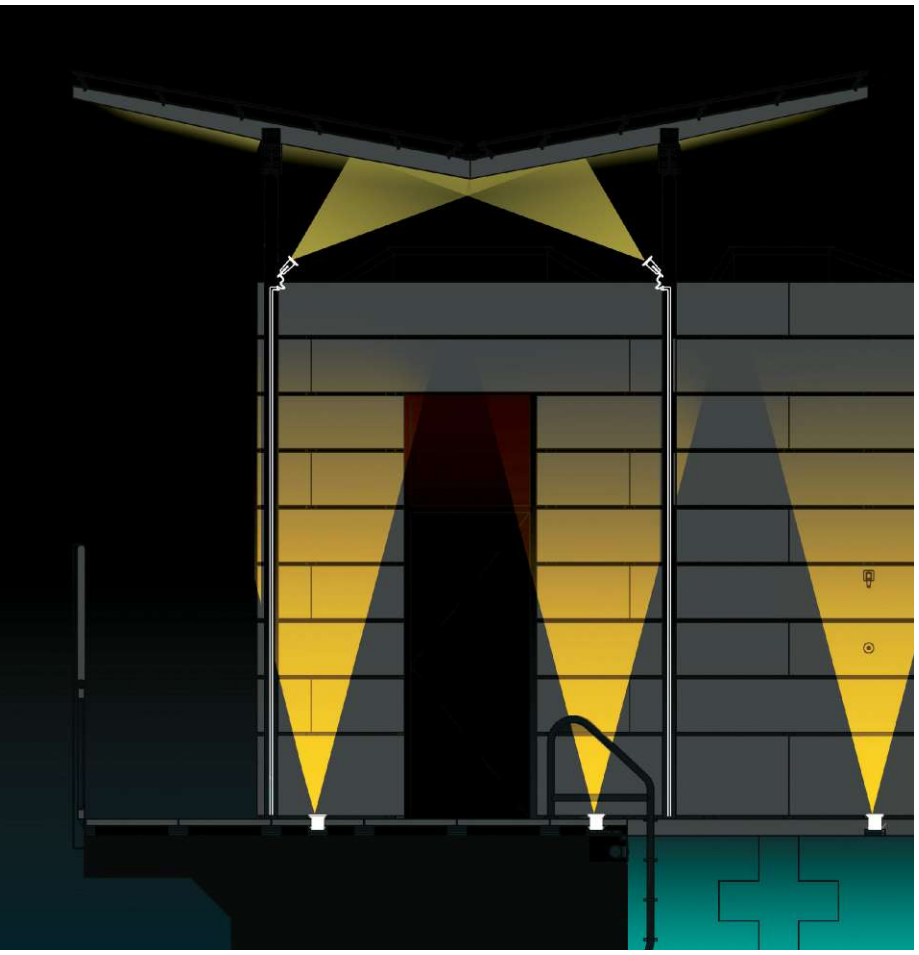
Designing a floating pool for the 21st century meant adhering to more-stringent requirements than those imposed on the city's original dipping platforms. "The program in essence was given to us by the Department of Health's requirements of public outdoor assembly," explains architect Jonathan Kirschenfeld. The most essential requirement was that swimmers had to shower before entering the pool. In addition, the barge's size—20,800 square feet—plus the size of the pool, determined the number of people who could legally occupy the facility at one time. That number led to the quantity of showers needed, as well as the sizes of the changing rooms.

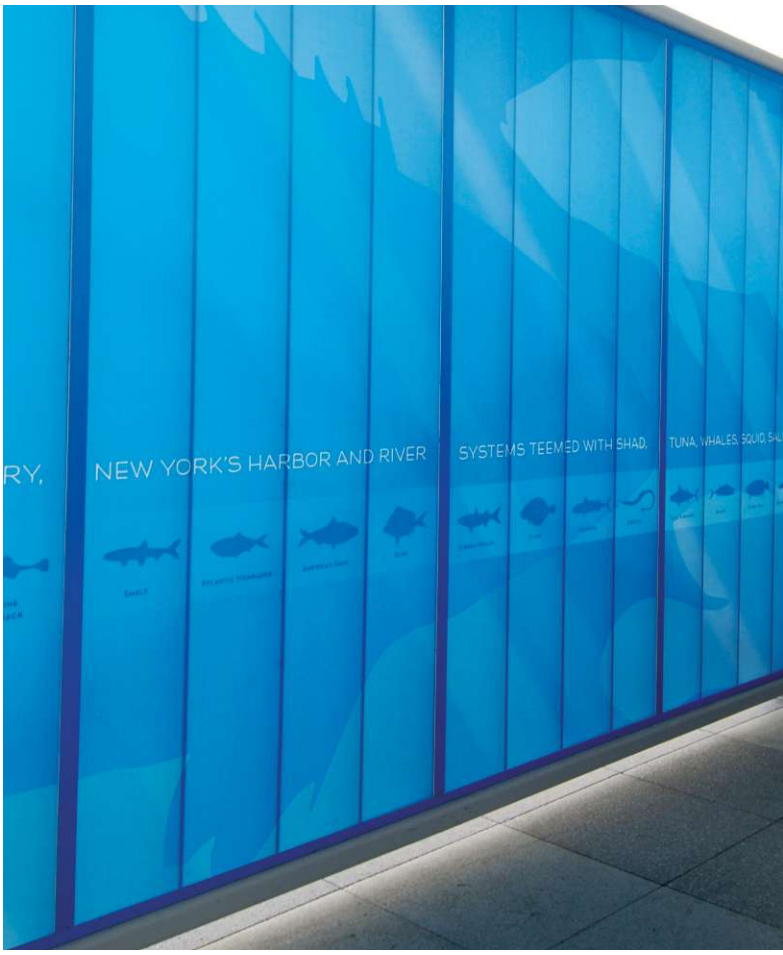
There also had to be a reception area and a manager's office. In addition to all of this, Kirschenfeld added a snack bar. "We enjoyed incorporating the Health Department's sequential requirements," he says. "They allowed us to do something picturesque with the ingress and egress of the facility."

Visitors board the barge via two gangways that lead to an area known as the "entry porch." This includes reception, the offices, the changing rooms and showers, the snack bar, and a dining area. The entirety of the entry porch is raised above the pool deck on concrete pavers and is shaded by a corrugated, galvanized steel roof. Visitors have to pass through this area to descend to the pool, which is sunk into the steel deck of the barge. At 25 meters, the pool is standard high school competition length.

While it first opened in Brooklyn Heights, the pool's mobile nature meant that it could be moved to any underserved waterfront neighborhood in the city to provide recreational

By providing more illumination than mandated by code within the swimming pool itself, the Health Department allowed the design team to keep light levels on the surrounding deck lower than code usually demands, a move which maintains views to the surrounding cityscape at night (this image). Globe lights outfitted with 34W compact fluorescents provide additional illumination for the changing rooms (below right). The lighting designer's rendering shows the placement of light fixtures and how the light it is bounced off of structural surfaces to provide even illumination (below left).





Philippe Baumann (top and bottom right); Rendering courtesy Tillet Lighting Design

swimming services. It was also programmed for night use, for swimming or for fundraising events. All of these programmatic requirements became considerations for the lighting scheme.

"Because it moved and would be put in different contexts, the lighting had to be self-contained," says Linnaea Tillett of Tillett Lighting Design. "We also thought about how to match the lighting to the emotional states of the people using the facility. There was the explosive joy of kids running around and swimming, but also the more mellow environment of people walking around with cocktails during fundraising events."

The goal was to create an airy, festive feel to the nighttime lighting scheme while maintaining views of the skyline. This meant using low-hung, shielded sources and not over-illuminating the space, a plan that required some negotiating with the Department of Health. "Their typical requirements call for an amount of lumens that would be equal to center court at the U.S. Open," Kirschenfeld says. "That seemed like a lot of light. But they agreed that if we provided more than was required inside the pool itself, we could go with an amount required for emergency exits elsewhere."

In service of this plan, the designers integrated 32W fluorescent-tube fixtures into the handrails of the gangways. A similar system of 17W T5 fluorescent fixtures bracket-mounted to the perimeter railing light the pool deck. The changing rooms are lit by 20W MR16 metal halide in-grade uplights that graze the concrete plank walls. Special care was taken to make sure that these sources did not get so hot that they would burn the wet feet of children.

Surface-mounted 50W MR16 halogen fixtures, mounted high enough that they can't be reached, uplight the corrugated roof, providing indirect illumination for the dining and reception areas. The steps that lead between the raised platform and the pool deck are lit by 4W LED steplights outfitted with louver shields recessed into the risers. All in all, the floating pool only uses 0.25W per square foot. Lighting manufacturer Targetti donated nearly all of the fixtures, which allowed this low-budget project to achieve such high standards.

For the past three years, the Floating Pool Lady has been moored in the Bronx at Baretto Point Park. There, it has become a catalyst for social change. "Architects have a political subtext," Kirschenfeld says. "The pool has become a vehicle for the mothers of kids in the area to form a group to demand that the city not extend the lease of a fertilizer factory whose stench was making swimming a challenging activity. We feel proud that the project has been helpful for attaining some social and environmental equality." •

Details

Project: The Floating Pool Lady, New York
Clients: New York City Parks Department and The Neptune Foundation, New York
Architect: Jonathan Kirschenfeld Architect, New York
Lighting Designer: Tillett Lighting Design, Brooklyn, N.Y.
Naval Architect/MEP Engineer: C.R. Cushing & Co., New York
Structural Engineer: Robert Silman Associates, New York
Marine Engineer: McLaren Engineering Group, Baltimore, Md.
Pool Consultant: Joel Trace, New York
Fire and Life-Safety Consultant: Paragon Building Consultants, New York
Project Cost: $3.8 million (including cost of barge); $183/square foot
Lighting Cost: The majority of light fixtures were donated by Targetti.
Project Size: 20,800 square feet
Watts Per Square Foot: 0.25 watts
Energy Code Compliance: Not applicable for temporary floating structure and outdoor assembly. Waiver received from the Department of Health for high-lumen nighttime lighting requirements due to neighborhood issues.
Manufacturers / Applications: Pentair (recessed submersible pool light with white LED lamps. Fixtures were installed in Louisiana because the hole had to be precut during the fit-out of the pool); **Phoenix** (recessed 4W LED steplight with a louver shield at stair risers); **SPI Lighting** (linear T5 fluorescent above perimeter railings to downlight circulation path along pool deck); **Targetti** (in-grade 20W metal halide MR16 uplight grazing vertical walls and surface-mounted 50W MR16 halogen accent light illuminating underside of gazebo canopy); **Waldmann Lighting** (linear T5 fluorescent fixture encased in acrylic tubing illuminating interior cabanas)

Photo and Video Links • For a behind-the-scene's look at the Floating Pool Lady's project history, go to floatingpool.org.

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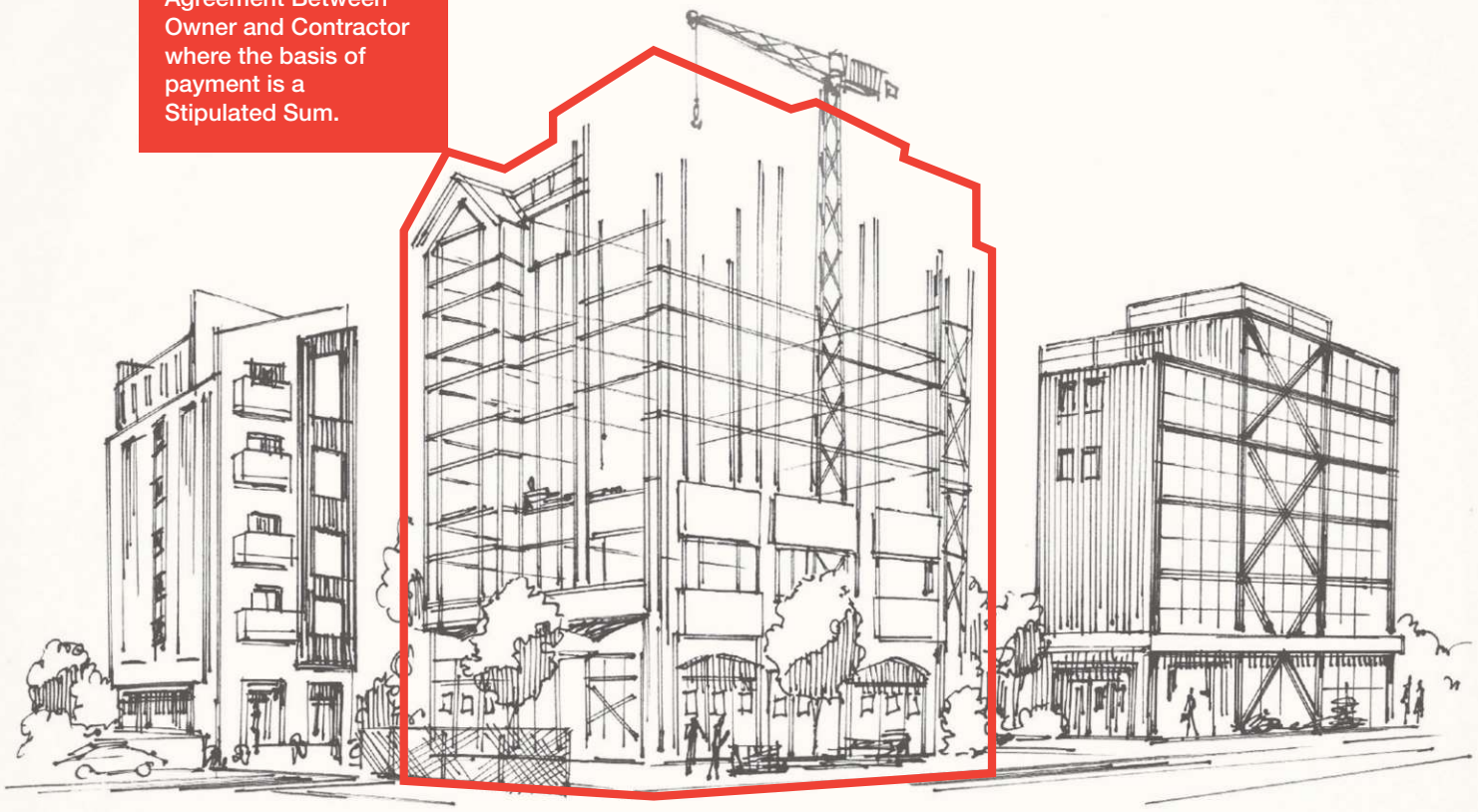
Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum.



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AD INDEX

Jan Lennox Moyer

interview by Elizabeth Donoff

> "In landscape lighting, although we do have to think about safety and getting people from point A to point B, what we are predominantly doing is giving people back a view into the night."

Jan Lennox Moyer has been busy. For nearly 30 years she has combined her passions for lighting and for landscape into a singular endeavor, and in the process emerged not only as one of the few lighting designers specializing in landscape lighting, but also as the practitioner who has come to define this specialty.

She wrote what remains the definitive book on the subject—*The Landscape Lighting Book* (Wiley, 1992), sharing her experience and wealth of compiled information, particularly on the topics of materials, finish, and corrosion. (A third edition is now in the works to address the integration of LED sources.)

The Landscape Lighting Institute—which she started in 1997, and is taught on the grounds of her own home and garden—is one of the rare landscape lighting workshops. And last year, she formed the Landscape Lighting Resource (LLR), a nonprofit educational foundation to preserve and promote the history and practice of landscape lighting design.

What's the distinction between outdoor, exterior, and landscape lighting?
"Outdoor lighting" is kind of a global name for everything that happens outside, so it includes parking lots and roadways and theme courts. Exterior lighting primarily applies to something that is attached to the outside of a building. Landscape lighting is gardens and all that they encompass, which would be plants, architectural and water features, sculptures, and paths.

Do you have a lighting philosophy?
I believe in the natural appearance of trees, but how can you do that? Trees are only naturally lit from above. So what I mean is, I want to show a tree's structure and its characteristics to the best extent that they can be shown.

How does landscape lighting differ from interior lighting?
Everything's always changing. The garden is always growing and changing its appearance from one season to another.

How do you start your design process?
By walking with an owner and discussing what their property means to them, how they use it, and what light means to them.

How do you "see" your home and garden?
I think of it as the world's laboratory. That's why I wanted to start the foundation [LLR], as a way to preserve this property and have it be the perfect place for people to try anything in terms of landscape lighting. I believe in sharing everything. Everybody should know as much as they can—that makes lighting better. •

BOREAL

SIGNATURE SITE LIGHTING

- stainless steel patterned lantern
- internal dichroic color filters, cyan or magenta
- IP-66 optical system

www.schreder.us
847 621.5100

The Right Light

Schréder
Schréder Group GIE

Circle no. 193 or http://archlighting.com/productinfo

Lutron® — save energy and reduce operating costs

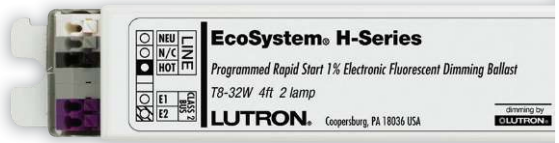
NEW next generation **EcoSystem®** can **SAVE 60%** of your building's lighting energy.

Improve comfort and productivity with this easily expandable system. **EcoSystem** is a commercial lighting control system that utilizes wired or wireless communication and seamlessly integrates daylight sensors, occupancy sensors and ballasts to create the perfect light.

NEW EcoSystem H-Series Ballast

$79 List Price

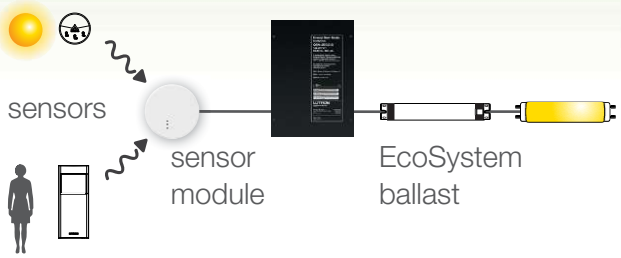
- Reliable fluorescent dimming down to 1%
- Digitally addressable ballasts allow for simple lighting reconfiguration with no changes to wiring
- New low price makes EcoSystem H-Series the perfect ballast option for any space



NEW Energi Savr Node™

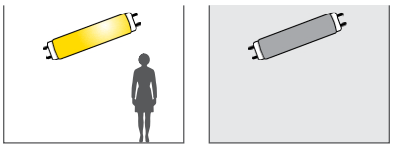
Integrates:

- EcoSystem ballasts—dim fluorescent lights and save energy
- Wireless daylight and occupancy sensors via wireless sensor module



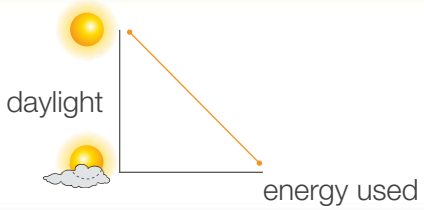
Occupancy Sensors

- Sensors automatically turn lights off when a room is vacant
- **NEW** Radio Powr Savr™ occupancy/vacancy sensors are easy to retrofit with wireless communication and 10-year battery life
- Can provide up to 20% lighting energy savings



Daylight Sensors

- Automatically dim or turn off overhead lights when daylight is available
- **NEW** Radio Powr Savr wireless daylight sensor is simple to retrofit with no new wiring
- Can provide up to 20% lighting energy savings



For more information about Lutron EcoSystem solutions—or to schedule an on-site lighting energy assessment—call **1.888.LUTRON1** or visit **www.lutron.com**

LUTRON®

save energy with Lutron™ ®

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