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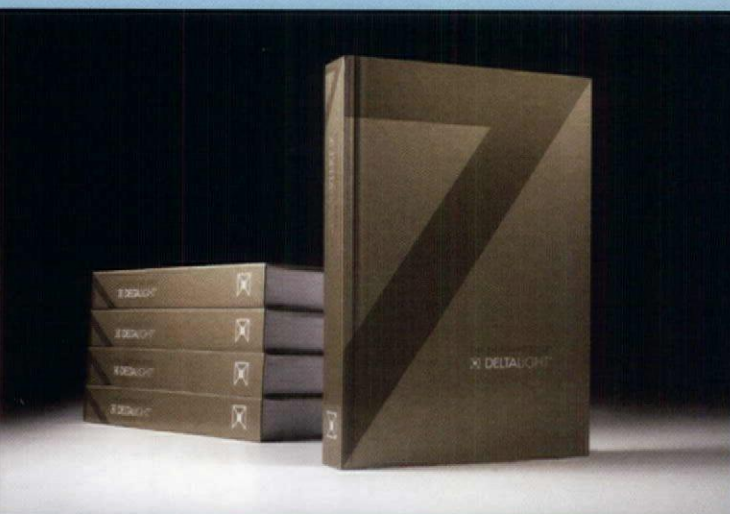
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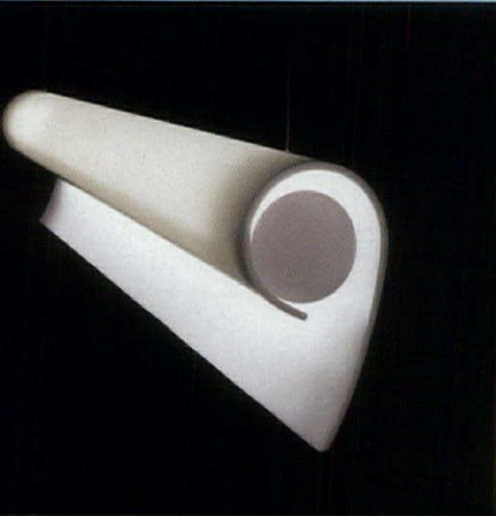
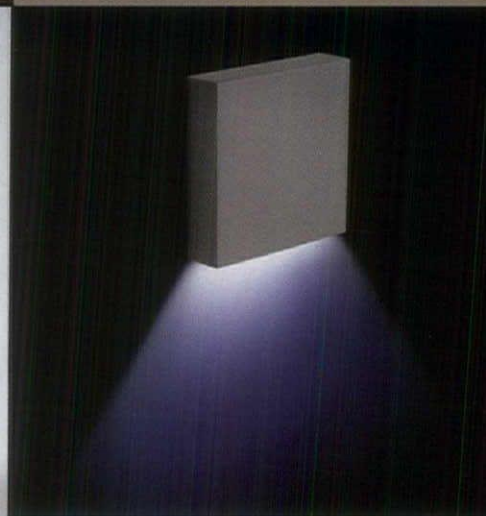
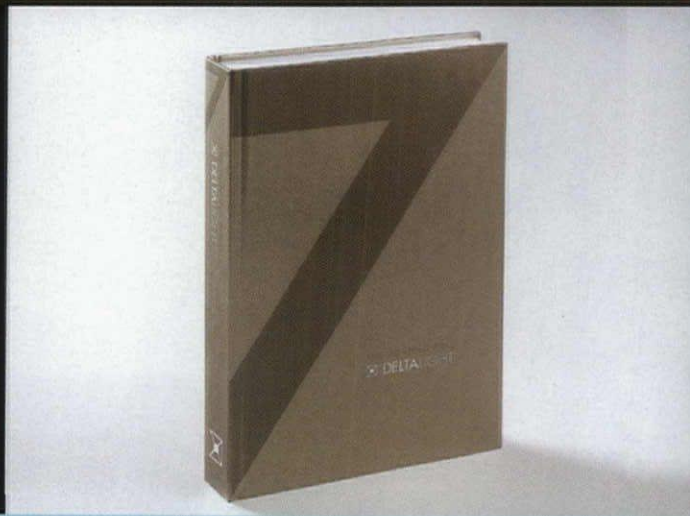
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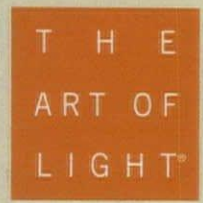
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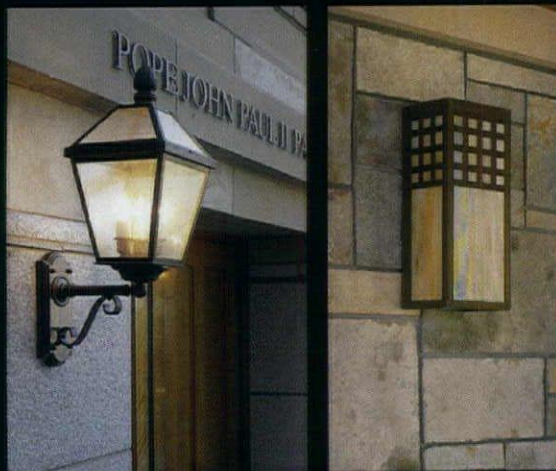
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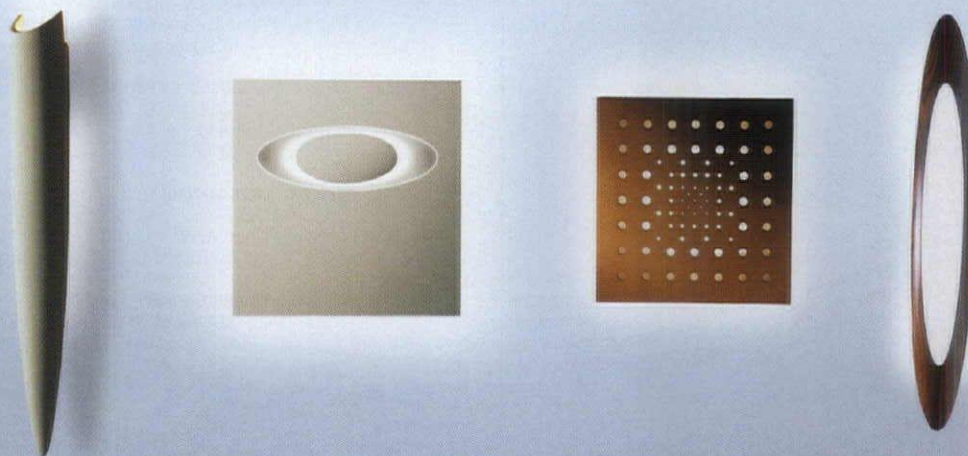
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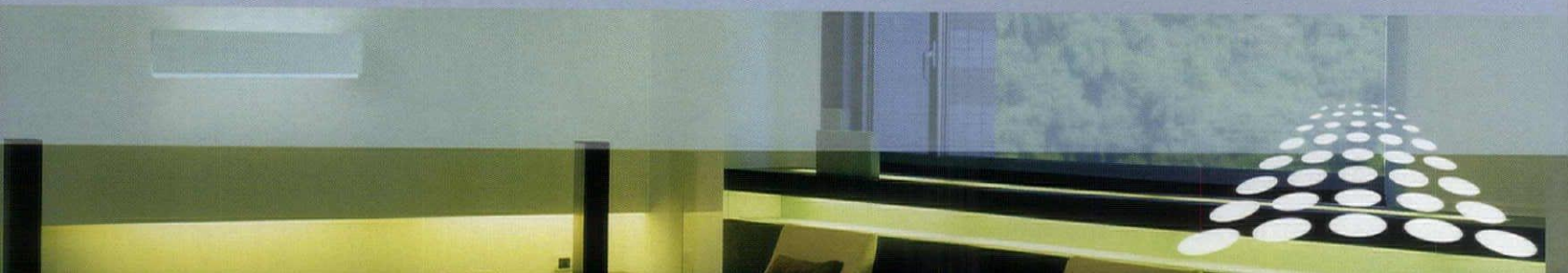
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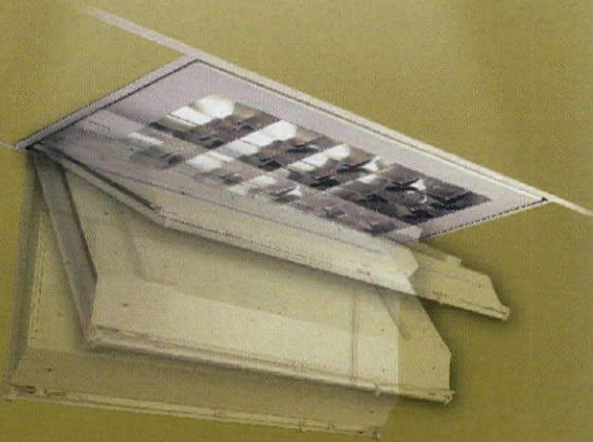




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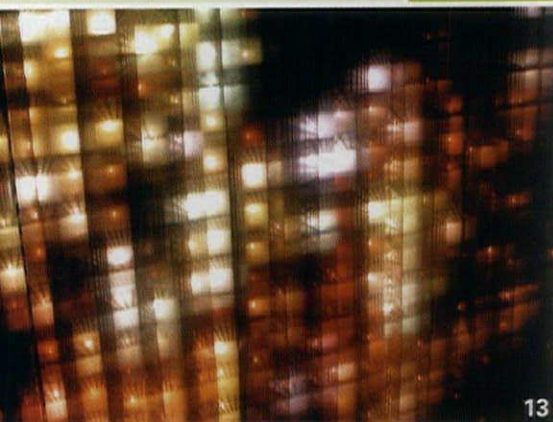
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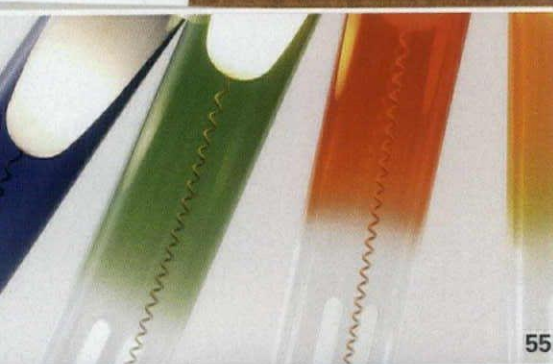




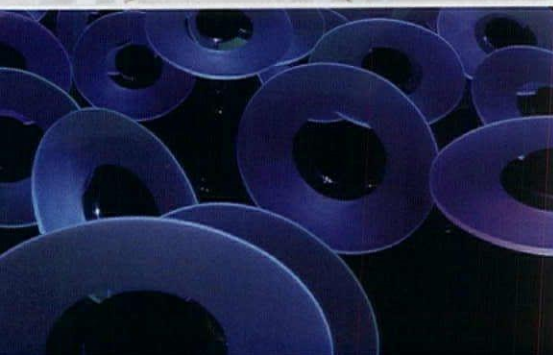
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**Cover:** The Sidwell Friends Middle School Addition, Washington D.C. PHOTOGRAPHER PETER AARON/ESTO

**This page:** "A City for Everyone," one of the 2007-2008 "Transitions: Light on the Move" container installations on display in Rotterdam; vertical red cedar fins on the elevation of the Sidwell Friends Middle School shield the interior from direct solar exposure; Kartell's Toobe light; "Spring of Light," another of the Transitions container installations on view in Rotterdam.



These articles can be found at [www.archlighting.com](http://www.archlighting.com).





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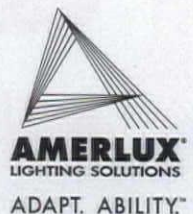


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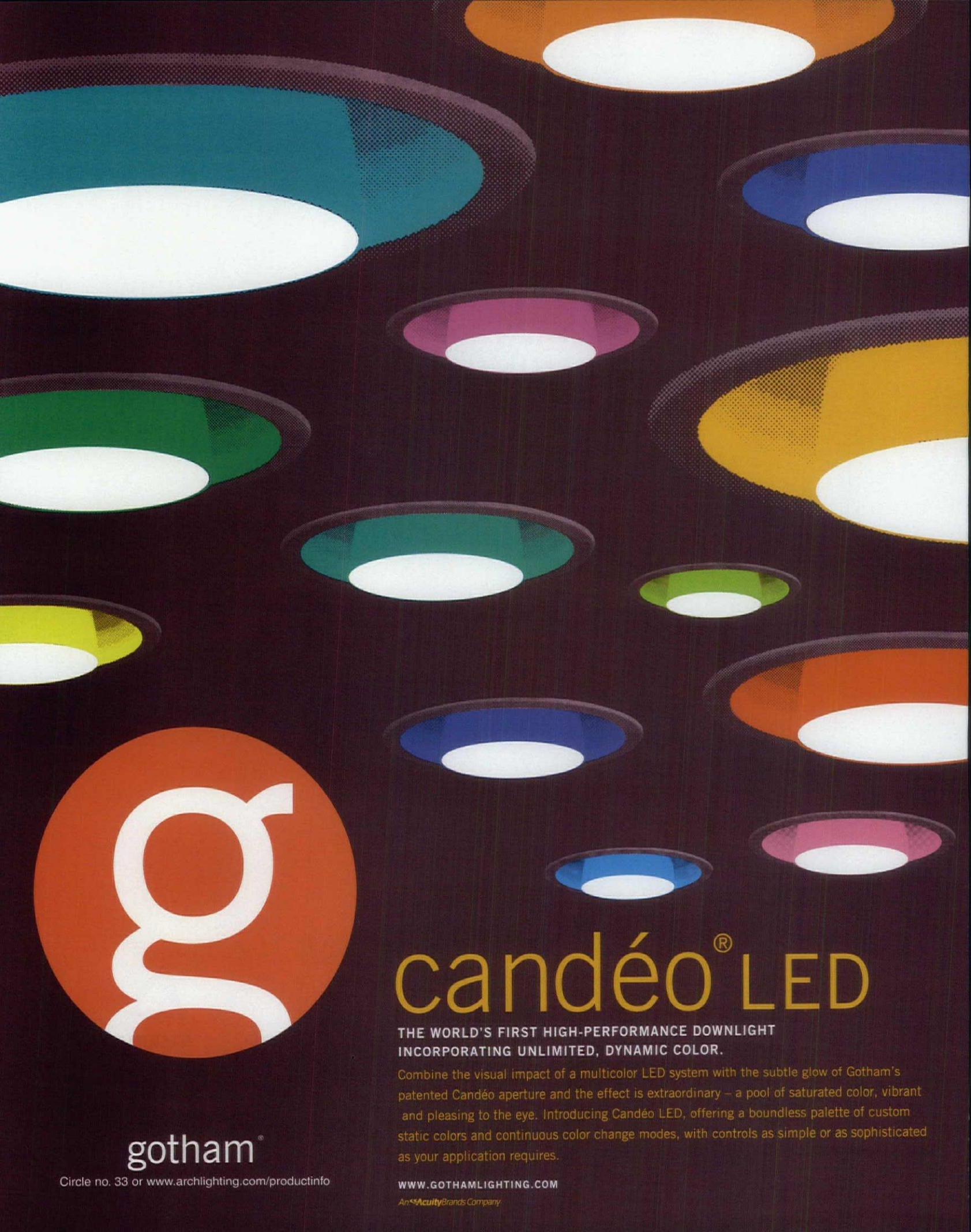
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## Global Communication

**THE PAST SEVEN WEEKS** (APRIL 17-June 5) have been unprecedentedly busy.

No sooner had the last pages of the April/May issue been sent off to the printer, did I find myself embarking on a schedule unlike any I have ever experienced. During this period, four weeks were spent at conferences and tradeshows taking me from Milan to San Antonio to New York to Eindhoven and Rotterdam, the Netherlands. Add a smattering of days in between trying to catch up with chores, a week dealing with my move from New York to Washington D.C. coupled with shipping the current June issue you are reading, and I'm sure you will agree a schedule such as this is—well, crazy.

Mind you I'm not complaining. I love to travel, despite the hassle it has become in the post 9/11 world. I dutifully trooped through my quad of travel-related delays during the course of eight flights, and had my person and belongings "searched" more times than I would care for. But I knew that the reward awaiting these inconveniences was the ability to experience new places, attend extraordinary events, and meet amazing people. And as I traveled through an extreme variety of venues, I was reminded time and time again, just how truly global lighting is, not just in its reach, but also in the make-up of its community. I saw American colleagues in Milan, Mexican colleagues in Rotterdam, German colleagues in San Antonio, British colleagues in New York. The importance of attending conferences and tradeshows—the opportunity for communal

gathering—should not be underestimated. It enables discussion and exchange to occur at a broader scale, and it is one of the most significant ways I can hear from all of you about the issues that are of concern, projects that are of interest, and where *Architectural Lighting* magazine fits in to your practice of lighting design.

In this issue which addresses the theme of innovation, it strikes me that what represents real innovation today is not another new fangled gadget, but communication—real one-on-one dialogue where people are sharing the experience of place, activity, and ideas (hopefully) void of interruptions caused by technology (you know those cell phone and Blackberry things). The past seven weeks have been unprecedentedly busy, but they have also been an unprecedented opportunity for me. It is often in the moments running in between meetings or to get to the next seminar that you bump into someone and have the most interesting conversations. "Seeds are planted" so to speak, that will bare great fruit later. My notebooks are filled with the events and ideas of the past weeks, and you can be sure many of them will find their way in some shape or form onto the pages of A|L. For the moment though, I need to pause and communicate with the laundry bag that has been calling for my attention and requesting some quality time.

**ELIZABETH DONOFF**  
EDITOR

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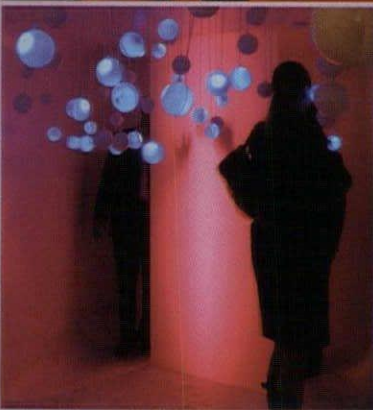
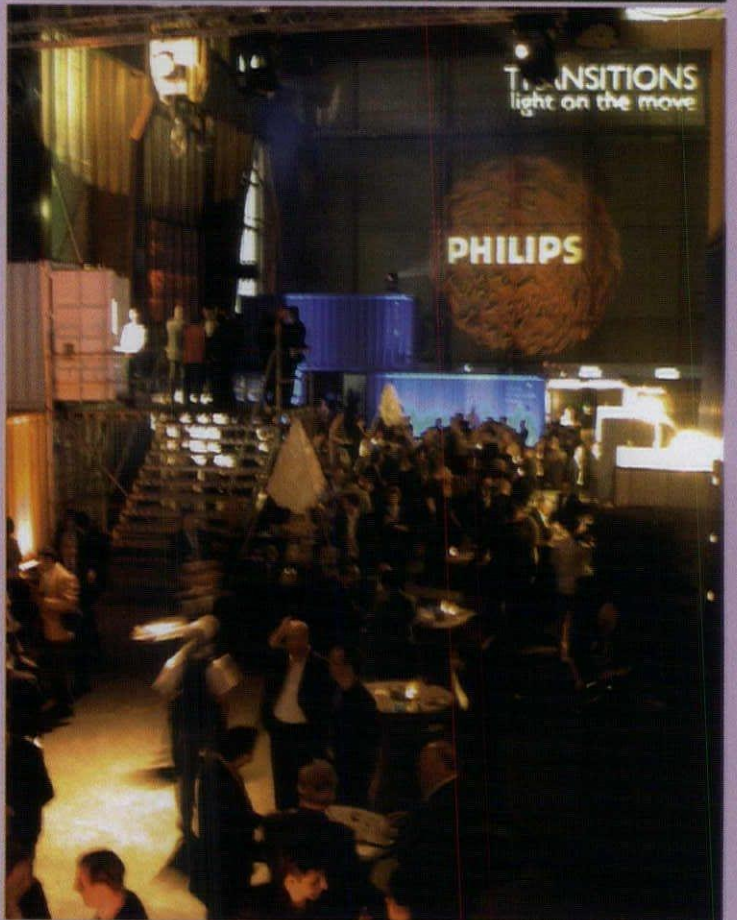
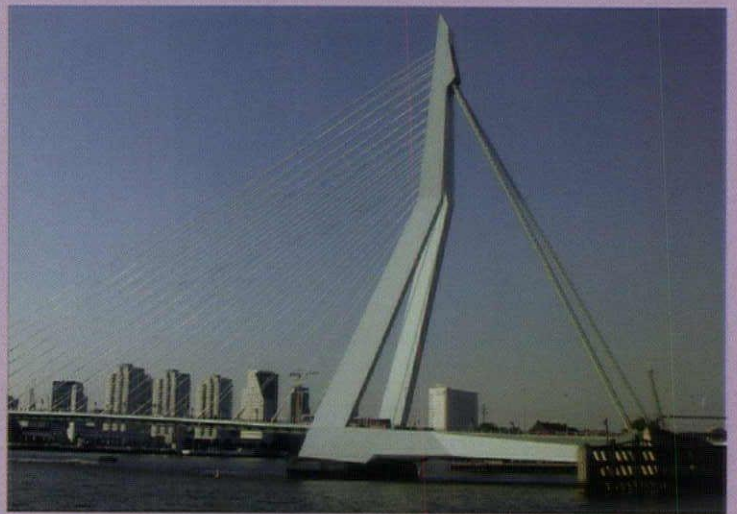
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## EXPLORING LIGHT IN THE URBAN REALM

AN INTERNATIONAL DRAW OF ARCHITECTS, LIGHTING DESIGNERS, URBAN PLANNERS, AND LIGHTING industry professionals assembled in Rotterdam, the Netherlands on the occasion of the Philips' City.People.Light Forum. Held to coincide with Rotterdam's 'Year of Architecture,' in cooperation with the Lighting Urban Community International (LUCI) and Professional Lighting Design (PLDA) Associations, the two-day artistic and intellectual celebration of light in the urban environment commenced with the exhibition "*Transitions: Light on the Move*." Following the success of the first *Transitions* (2006-2006), lighting environments constructed in shipping containers, commissioned by Philips and designed by an international cadre of architects and lighting designers, this is the second group of containers to be commissioned—eight in total for 2007-2008. This year's selection of *Transitions* designs explore the themes of sustainability and globalization through human interaction with light, sound, color and form, evoking light's power in challenging our perception and touching our emotions. The containers will continue to tour Europe through 2008 visiting Benelux, Denmark, France, Germany, Italy, and Poland.

The second day of the forum, with opening remarks by the mayor of Rotterdam, Ivo Opstelten, hosted a series of presentations and panel discussions on the role of lighting in the urban realm, along with galleries displaying ideas for urban lighting concepts discussed during the four City.People.Light workshops that took place in Lyon, France, Philadelphia, Shanghai, and Hamburg, Germany, the results of which are published in an accompanying volume. The evening was capped off with a boat tour of the six lighting installations along the River Maas, worked on by student teams during the week as part of the PLDA workshops. From the discussions to the various installations, the City.People.Light Forum showcased light's critical role in shaping our experience and our environments. **ELIZABETH DONOFF**



The Erasmus Bridge on the River Maas, a Rotterdam landmarks (top). The festivities during the exhibition "*Transitions: Light on the Move*" (above). Color-changing illuminated discs recall a field of flowers in Mansilla + Tunon's "*Spring of Light*" container installation (left). London-based BDP Lighting's "*Life Cycle*" container installation pays homage to circadian rhythms (far left). A display of the City.People.Light workshop findings (left, top).



## IESNY SPONSORS FOUR-PART SERIES ON THE INCANDESCENT/CFL LAMP DEBATE

ON APRIL 21, 2007, THE ILLUMINATING ENGINEERING SOCIETY'S NEW YORK CHAPTER HELD THE FIRST in its series of four panel discussions regarding the incandescent / compact fluorescent lamp debate. Representatives from the three major lamp manufacturers—General Electric (GE), Osram Sylvania, and Philips—were on hand to help clarify what one presenter called "a lot of confusion and misinformation" about incandescent sources and the recent flurry of legislation aimed at phasing it out the incandescent lamp in favor of more energy-efficient alternatives.

Susan Isenhour-Anderson, energy relations manager at Osram Sylvania, began the evening with a comprehensive overview of existing and pending legislation both in the United States and abroad. She pointed out that Australia's recently passed law, which received a great deal of press when it was passed, does not call for an outright ban on incandescent lamps; rather, it sets performance standards. Isenhour-Anderson went on to outline the various bills working their way through U.S. legislative circles: a bill in California, for example, initially called for banning incandescent sources, but now seeks to set performance standards, while the state of Minnesota has proposed levying a 25-cent tax on incandescent lamps. (Isenhour-Anderson's summary of state legislation is available on Osram Sylvania's website: <http://tinyurl.com/3cum9m>). As

to where the company stands on the issue, Isenhour-Anderson stressed that Osram Sylvania supports the National Electrical Manufacturers Association's (NEMA) call for a federal standard, which would preempt state laws. "As manufacturers, we can't deal with fifty-one different laws, and that's where we're headed," she stated.

Mary Beth Gotti, manager at GE Consumer & Industrial's Lighting Institute in Cleveland, Ohio, began her presentation with a brief history of the incandescent bulb lamp and framed the topic of energy efficiency in terms of technology. "People love the quality of incandescent," she said, and the question for GE is "how can we drive this technology to its limits?" GE's response to the possible bans will be the introduction of a high-efficiency incandescent lamp. "We can't talk about the technology at this point," she said, but it will provide the performance of an incandescent with a 30 percent increase in energy efficiency over standard incandescent lamps by 2010 and 60 percent improvement by 2012. For this reason, she hopes that any legislation would be performance- rather than technology-based. "You have to give engineers and scientists a chance to see what they can do with technology," she said. A sentiment, which echoed remarks made by James P. Campbell, president & CEO of GE Consumer & Industrial at the GE Edison Award presentation on May 7, 2007, during Lightfair.



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Philips has taken a fairly significant public stand on the issue. (See "Philips Leads Lighting Efficiency Coalition," page 22, April/May 2007). William Middlebrook, technical support representative at Philips, responded to criticism of Philips' announcement in December 2006 that it would phase-out incandescent light bulbs by 2016. "I feel like Custer riding into Little Bighorn right now," he said as he began. Mr. Middlebrook stressed: "We never used the term ban; we will not use the term ban. We want to phase out inefficient light sources." He pointed out that Philips' initiative addresses an existing environmental crisis, not an imminent one. "The facts are that we have power outages," he said. "We have the problem now. It's not going to be a couple of years from now." Similar initiatives to phase out incandescent sources also exist for the commercial market, said Mr. Middlebrook, but for the moment "all we're doing is looking at the residential side of the business."

A lively and at times heated question-and-answer session followed. One audience member raised questions about mercury levels in compact fluorescent lamps, citing news reports of a consumer who spent \$2,000 hiring a hazmat team to clean up a broken compact fluorescent lamp. Isehour-Anderson said that inexpensive disposal guidelines are available on the EPA's website. If an outright ban of incandescent lamps were to

be put into effect, the manufacturers' representatives said they had two major concerns: meeting production demands and providing adequate recycling options for consumers.

David Singer of Brooklyn-based Arc Light Design moderated the event, concluding, "We're all interested in reducing energy, but maintaining the quality and the effect of the lighting." The next discussions in the series will be on July 19 ("The Effect on Design and Sustainability"); August 16 ("Light and Health"); and September 17 (a recap of the previous events coupled with a designer's workshop). All events will be held at the Center for Architecture in New York City; details at [www.iesny.org](http://www.iesny.org). **MICHAEL HSU**

*Michael Hsu is a writer based in Brooklyn, New York.*



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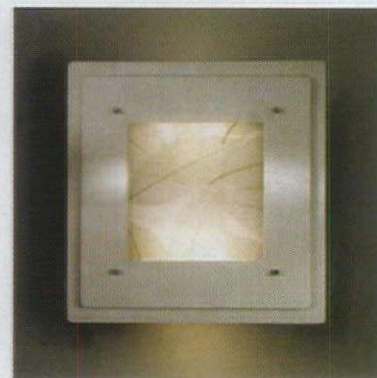
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## RESPONSE TO THE MARCH 2007 EDITOR'S COMMENTS

I READ YOUR MARCH 2007 COMMENTS ARTICLE "LEAD THE WAY" with special interest, especially the last paragraph regarding the IALD and IESNA's involvement with the sustainability dialogue. As President of the IESNA I would like to point out that the IES is very active in the dialogue.

First, we are actively working with the AIA, USGBC, ASHRAE, and Architecture 2030 to define what the baseline measurements will be for "getting to fifty." The organizations hope to release a joint statement soon regarding this matter.

Second, we have completed along with AIA, USGBC and ASHRAE Advanced Energy Design Guides for small office and small retail buildings. These guides, intended as companion "above code" documents for ANSI/ASHRAE/IESNA Standard 90.1-1999, demonstrate how these buildings may be built 30% more energy efficient than the standard. We are also working on two additional guides for warehouses and schools.

Third, IES, ASHRAE, and USGBC are working on Standard 189. The proposed Standard 189, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, will provide minimum requirements for the design of sustainable buildings to balance environmental responsibility, resource efficiency, occupant comfort and well-being, and community sensitivity. Using USGBC's LEED Green Building Rating System, which addresses the top 25% of building practice, as a key resource, Standard

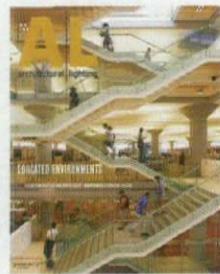
189P will provide a baseline that will drive green building into mainstream building practices.

Fourth, the IESNA is hosting a symposium in St. Louis, Mo. November 2-3, 2007, entitled, "Quality Lighting in A Green World." The purpose will be to explore the future of the lighting profession. Owners and designers will present case studies from the office, retail and public sectors on what state-of-the-art is in creating buildings that are environmentally responsible and sustainable. At this day-and-a-half symposium we will examine the current state of lighting technology and then challenge the industry with what future needs will be in order for us, as professionals, to deliver truly integrated high performance buildings.

So as you can see I believe the IESNA is leading by actually creating documents that designers can use to get to goals that others are promoting. We are discussing even more initiatives in this area and how we can work with the organizations to accelerate the dialogue.

Hope this helps explain what the IES is doing in the areas you mentioned in your article.

KEVIN J. FLYNN, AIA, IESNA, 2006-2007 IESNA PRESIDENT  
St. Louis, Missouri



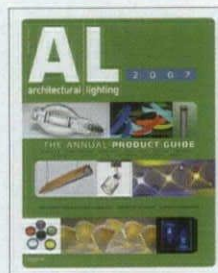
## RESPONSE TO THE APRIL/MAY 2007 EDITOR'S COMMENT

LET ME OFFER MY STRONGLY AFFIRMATIVE RESPONSE TO YOUR fantastic editorial, "An Incandescent Truth?" in the April/May edition of A|L. Quite often, people who are not in the design profession(s) are simply not present to the essential role design plays in their lives. They are clueless! And, of course, we designers know it is all about design! Or rather it's about design and its marriage to necessity, with necessity, the nagging spouse, urging design on to even greater and more dizzying heights of achievement and success!

And this is, as you so aptly point out, what needs to happen now. It is time for design to take the reins from governance and public opinion and find the solution(s). The best use of the general public's and government's efforts right now is to support that scenario. Design is not something confined to the rarified bastions of

Gehry and Hadid, Rashid and Stark; it lives, breathes and thrives in the heart of the everyday. This is the national conversation that needs to be reinvigorated now, before it's too late. Technology is zooming along at such an enormous clip, but we must never allow it to eclipse the very spirit of design that brought it into being. Such vigilance is surely one of the greatest challenges of our generation's watch, here, on the planet.

CELESTE GAINEY, PRINCIPAL, GOTHAM LIGHT & POWER  
East Hampton, New York

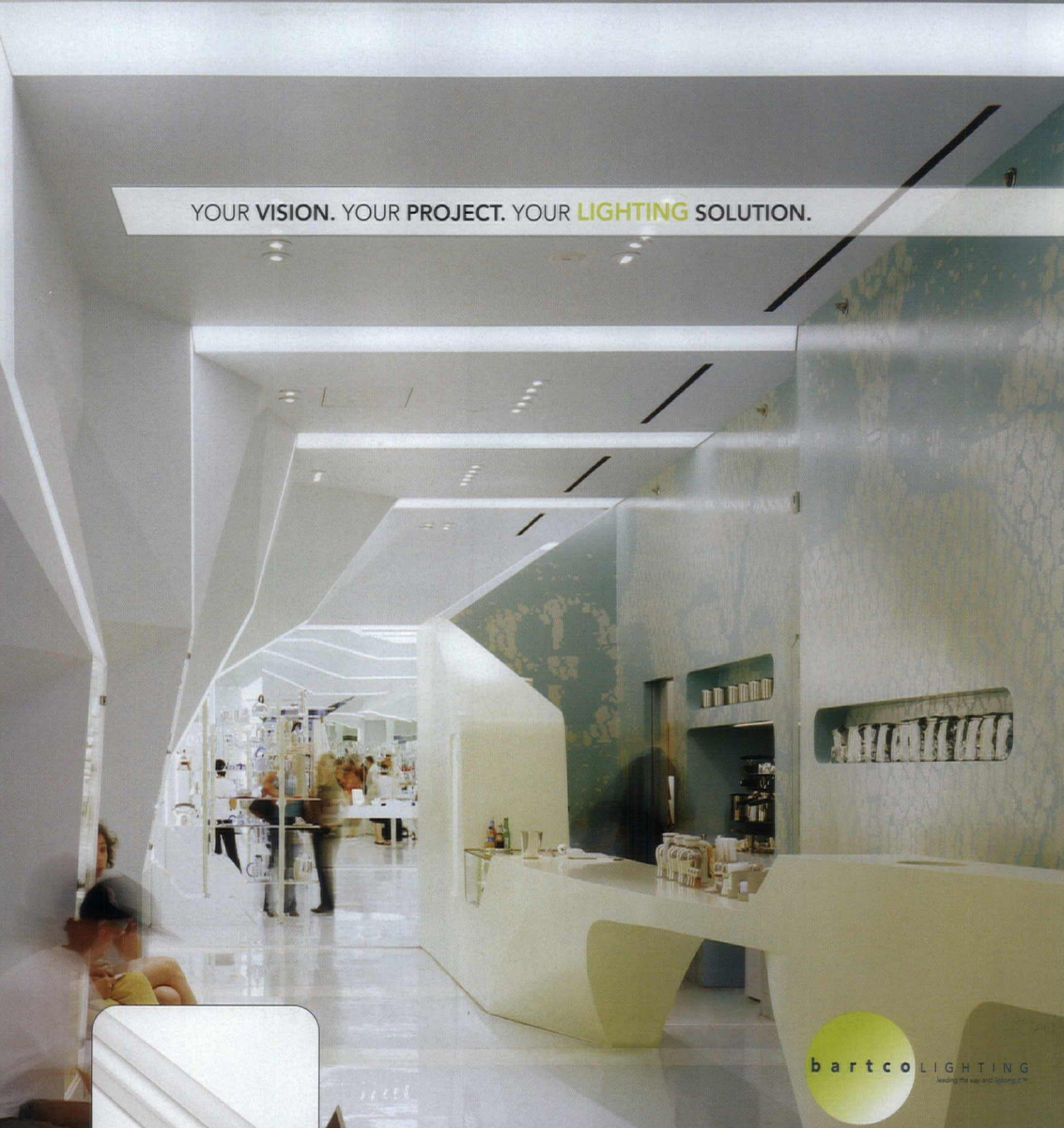


### CORRECTIONS

A pair of corrections from the April/May 2007 issue: The pendant luminaire on the second line of cover images should have been attributed to Zumtobel. • Apologies to all Texans—in the article "San Antonio Spirit" the photograph described as the Alamo is in fact the Mission San Jose.



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# A Model for Outdoor Lighting Ordinances BY NANCY CLANTON

COMMUNITIES AND STATES ARE INCREASINGLY RECOGNIZING THE BENEFITS OF establishing some regulation for outdoor lighting. The move may be prompted by citizen complaints about poorly designed installations, a desire to save energy, or an awareness of losing sight of the night sky. Exterior lighting regulation is also finding its way into many energy codes and regulations such as California's Title 24 and ASHRAE's 90.1-2004. Even the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system has a credit for reducing light pollution.

For all these reasons, there is a need for a technically sound model lighting ordinance that communities can adopt and that is understood industrywide between lighting designers, engineers, contractors, manufacturers, and community officials. The Model Lighting Ordinance (MLO) is currently being developed by a joint task force of the International Dark-Sky Association (IDA) and the Illuminating Engineering Society of North America (IESNA) to be this technically sound document.

If all goes well, the MLO will be available for public review during summer 2007. Watch for announcements from IDA and IESNA when input will be requested. IDA will have public review announcements on its website ([www.darksky.org](http://www.darksky.org)), its E-Newsletter, and it will also issue press releases. Public review comments can be electronically submitted on [www.darksky.org](http://www.darksky.org). The IESNA will also make announcements to its members via its website ([www.iesna.org](http://www.iesna.org)) and to the committees about the public review process. This public review process is open to any interested party.

## BACKGROUND

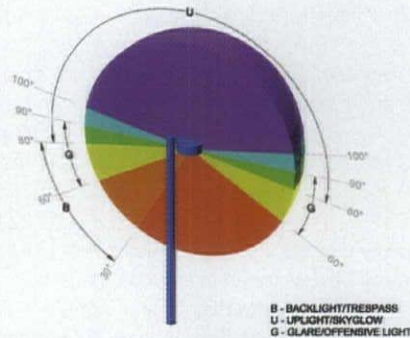
Hundreds of lighting ordinances exist, varying widely in complexity and technical soundness. Many of these ordinances require planners and enforcement officers to be knowledgeable in lighting equipment, measurements, and calculations. As a result, the ordinances are often not enforced, and communities are not achieving the desired results.

The IDA/IESNA Task Force was formed with equal representation from both organizations. It is composed of lighting designers and engineers, dark-sky advocates, manufacturers, a utility representative, a city planner, and an illuminating engineering professor. This diverse group of people has expertise in all of the areas considered crucial for a successful and defensible lighting ordinance.

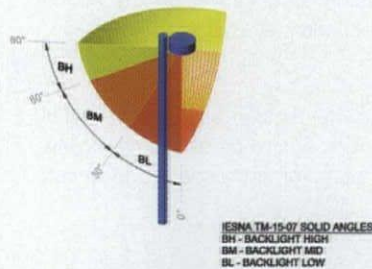
## PROJECT GOALS AND OBJECTIVES

A model ordinance must be easily understood by audiences from the technical adept to the general public. Striving for

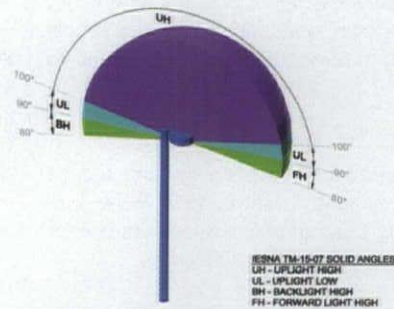
Diagrams outline the amount of light (lumens) emitting from luminaires in Backlight, Uplight, and Glare Zones—referred to as the BUG rating system.



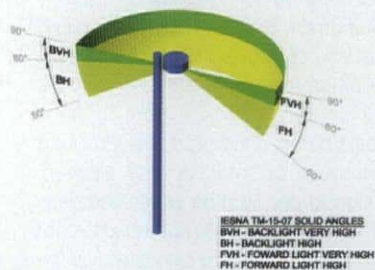
MLO BUG RATING



"B"-BACKLIGHT/TRESPASS



"U"-UPLIGHT/SKYGLOW



"G"-GLARE/OFFENSIVE LIGHT

The MLO is a technically sound model lighting ordinance that communities can adopt, and that is understood industrywide between lighting designers, engineers, contractors, manufacturers, and community officials.



sound simplicity has been the overall goal. The simpler it is, the greater the chance that it will be understood, adopted, and enforced.

Other critical goals are:

- Adaptability to a variety of communities from small to large, rural to metropolitan
- Minimizing sky glow and light trespass
- Accepted by environmentalists and manufacturers of lighting equipment
- Simple to use and understand, yet technically sound

### THE ORDINANCE DETAILS

The ordinance deals with all private property exterior lighting, including residential properties. A separate ordinance will be developed to address roadway and other right-of-way properties. Sections on streetlights and signs will be added in the MLO in future revisions. The main sections of the MLO will include definitions, regulations for nonresidential and residential lighting, and special permits. The emphasis throughout the reference document is on minimizing light trespass and glare and on environmental sensitivity, with due regard to safety issues and good lighting design. (As the MLO is still a work in progress, some sections may change.)

### FRONT-END SECTIONS

The first sections of a lighting ordinance (preamble, applicability, definitions, etc.) help set the stage for the lighting ordinance details that follow. This portion of an ordinance needs to be community-specific to ensure community buy-in.

### USE OF LIGHTING ZONES

Lighting zones (LZ) are used to assign ambient lighting designations to different area use types, such as single-family residential or a 24-hour entertainment district. Lighting zones vary in ambient lighting: no light (LZ0), low (LZ1), moderate (LZ2), moderately high (LZ3), and high (LZ4). Many small communities may use only one zone (such as LZ1) to simplify enforcement and compliance. Large metropolitan areas may need to use all lighting zones.

### LIGHTING CONTROLS AND CURFEWS

The MLO recommends the use of controls to save energy and reduce unwanted light. Communities are encouraged to set curfews when outdoor lighting is reduced or extinguished. This not only reduces the chance of light trespass, but also saves energy during low-activity times.

### COMPLIANCE METHODS

The MLO offers two compliance methods, prescriptive and performance. Installations with no aimable lighting can follow a simple prescriptive path. Simpler prescriptive methods such as lumens per parking space are also being explored. More complicated installations with adjustable lighting and higher lighting levels, such as a sports facility, can follow the more complicated performance path. The first MLO edition may be offered without the performance method.

The prescriptive method has a two-part compliance path. The first part prohibits over-lighting by limiting the amount of total lumens allowed. Maximum lamp lumen densities are assigned per lighting zone, with less light allowed in LZ0 and more in LZ4. In order to accommodate different sizes, use types, and shapes, the lumen density limits are calculated as follows: *Total initial lamp lumens allowed per site = lumen density (lumens*

*per square feet) x hardscape area (feet) + lumens per linear foot x perimeter (feet) + initial lumen allowance (one per site).*

Some additional lumens may be allowed for specific uses such as façades, entries, emergency facilities, eldercare facilities, and outdoor retail establishments.

The second part limits the amount of light (lumens) emitting from luminaires in backlight, upward, and glare zones. This has been coined the BUG rating for luminaires. IESNA TM-15-07 "Luminaire Classification System for Outdoor Luminaires" describes the lumen distribution within solid angles required for the BUG ratings.

Each lighting zone will allow different luminaire BUG ratings such that LZ1 will allow less or no light compared with LZ4. Manufacturers will give each luminaire a BUG rating per lamp type and wattage.

The performance method is the more complicated path of compliance. It limits the amount of light leaving the site (sky glow), minimizes light trespass (maximum candela values leaving the site), and also prohibits over-lighting (similar to prescriptive method with lumen density limits). Since the sky glow calculates both direct and reflected light, computer programs will be required to show compliance. The task force has received excellent feedback from computer software programmers in how the performance method will be calculated and calibrated.

### PROCESS GUIDELINES

To encourage communities to adopt the MLO, it is designed to be easy to use and to provide clear process guidelines for implementing each part of an effective ordinance. For example, residential outdoor lighting regulations need to be extremely simple for the general public to understand. The MLO section on residential lighting suggests limiting the amount of lumens per residence (or watts). In addition, there is a simplified luminaire description of solid tops and sides for luminaires with high-wattage lamps.

The MLO can not possibly cover all the variety of lighting situations, but it does make it easy for any community to create a lighting ordinance that fits its particular needs, and is technically sound and enforceable.

### SUMMARY

The Task Force is in the final stages of MLO development. Table values are being checked and verified, sample sites are being tested, and performance method formulas are being developed with sample results for the computer programs. Some luminaire manufacturers have been involved in the values assigned to the BUG ratings. The MLO should be available for review this summer, when professional and manufacturer input will be requested. The IDA and IESNA through their websites, member announcements and press releases, will announce the public review process.

The MLO will provide a standardized structure and methodology for lighting ordinances. As it gains acceptance, compliance will increase, and sky glow, light trespass, and energy use will all be greatly reduced from today's practices. And with both IDA/IESNA developing this, the MLO will be defensible, which is critical for codes and regulations. The MLO should be a major step forward in improving the quality of nighttime lighting and creating a clear guide for outdoor lighting requirements.

*Nancy Clanton, PE, IALD, FIES, LC, LEED AP, President of Clanton & Associates, Inc. in Boulder, Colorado, is a member of the joint IDA/IESNA Model Lighting Ordinance Task Force, Chair of the IESNA Outdoor Environmental Lighting Committee, and serves on the IDA Board of Directors.*



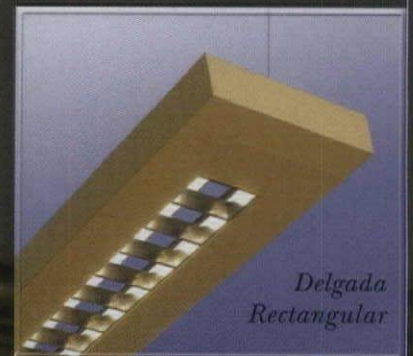
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# INNOVATION

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BY ITS VERY DEFINITION THE TERM INNOVATION SUGGESTS SOMETHING NEW OR NOT YET CONCEIVED. WHETHER INNOVATION takes the form of an idea, an object, or a process does not matter so much as the desire to explore stays true. In the selection of people, projects, and products *Architectural Lighting* magazine has chosen to visit this month, each displays a dedication and commitment to seek new possibilities in their work, unwilling to accept the status quo.

From the unwavering devotion to craftsmanship and exploration of form and light in the luminaries of Italian lighting company LucePlan to the reexamination of an environment such as an airplane interior we think has no other possibility of expression, as in the case of the Dreamliner, we are reminded that the pursuit of excellence, when coupled with curiosity, results in the creation of exceptional design.

Yet often, even when it seems as if all possibilities have been explored, we are reminded that there is always another way to envision and interpret. The challenge is how to respond to information even when it reveals itself not to be favorable. The environmental initiatives of Architecture 2030, and the detailed sustainable systems integrated design approach to the Sidwell Friends Middle School Addition shows it can be done. And as long as we are honest with ourselves and admit that there is always room for improvement, then innovation is always at hand. **AJL**

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# INNOVATION: *profile* LucePlan, Craftsmanship and Creativity

*LucePlan, the Italian lighting company, founded in 1978 by Paolo Rizzatto, Riccardo Sarfatti, and Sandra Severi, has always been known for the elegance of its designs with their blend of technical acuity, functionality, and attention to detail. On the occasion of the opening of its New York City flagship showroom in February 2007, Architectural Lighting magazine sat down with Paolo Rizzatto and Alberto Meda to talk about their views on lighting and architecture, light's interaction with space—what it can create spatially, and how they as designers bring together ideas of illumination and technology.*

## **A|L: What inspired you to start working with light?**

**Paolo Rizzatto:** For me, light is the element that can make architecture visible. Without light you do not see the volume and shape of architecture. Light is the basis of architecture. Light is the play on the volumes.

**Alberto Meda:** For me it's different, in the beginning it was about trying to find a field which was very close to technical issues. Light is interesting because it is connecting all different fields.

## **A|L: What was the inspiration behind the start of LucePlan? How did the two of you start your working partnership?**

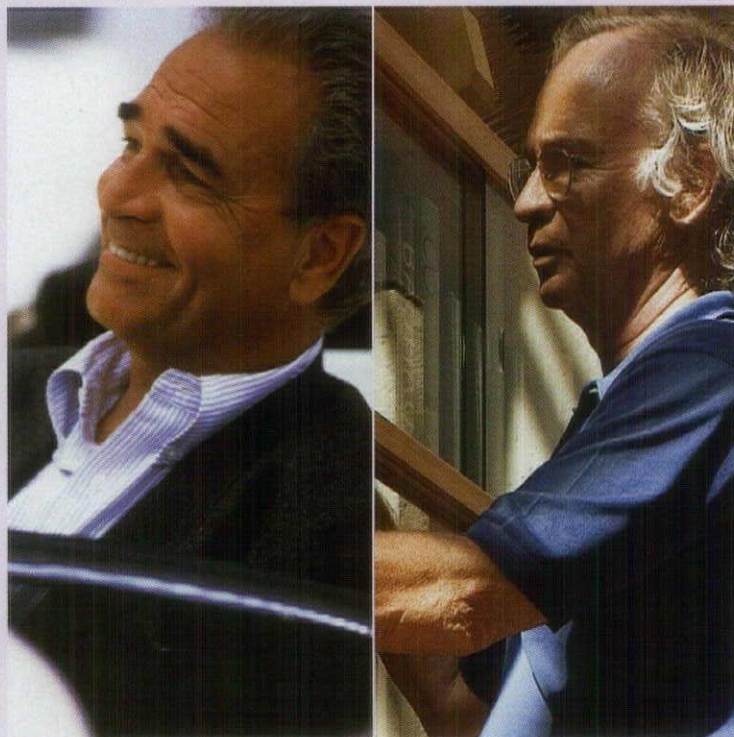
**Paolo Rizzatto:** I founded LucePlan [in 1978] with Riccardo Sarfatti, by chance really. We were good friends and studied architecture together at the same university (the Milan Polytechnic). We had this idea to make a new type of working environment. Riccardo was interested in organization and management; I was the designer. We each had different expertise; it was a good compliment. Also of course, Riccardo was already involved in light because of his father—Gino Sarfatti.

In the beginning the company was working specifically in the service of architects. Because we were architects, we knew the problems of lighting as it related to architecture, but year-by-year we began creating a small collection of lamps, and these lamps required more industrial design background. We met Alberto and we started to work.

**Alberto Meda:** I joined LucePlan in the early 1980s. I had worked with Kartell, the plastics company, for seven years. Then I had the opportunity to meet other companies, and make other things in materials and technology. Riccardo Sarfatti asked me to collaborate. At that time LucePlan was interested in bringing a more industrialized process to some of its products. We did a very nice lamp, which won the Compasso d'Oro—the D7—it was done with the mentality of industrialization. At the time, other products at LucePlan were tailor made for the specific project and application. Sarfatti's aim was to push in the direction of the industrialization of products. For that reason we met and he thought I would be able to help LucePlan with this.

## **A|L: Did you start creating your own light fixtures because as you were working on architectural projects you could not find the light you were looking for?**

**Paolo Rizzatto:** Yes. The first models were lamps we made for our own architectural projects or directly to make the light commissioned by another



**Alberto Meda (left); Paolo Rizzatto (right).**

er architect. We are working very closely to the problem of the light. You have to be able to give it enough structure so that the light will connect to the architecture. Light also has to respond to the need of the project, to the space, to people. It has to be able to function, but also speak to the beauty of architecture and for all the possibilities you can imagine.

## **A|L: A luminaire is often thought of as an object, but yet it has the ability to create an articulate space through the use of light. How is the thought process and creation of a luminaire similar or different than the process of creating an architectural space?**

**Alberto Meda:** Architecture affects your life in a general way, you are considering your special task in that moment. It's similar, but it's a question of scale. In architecture you use your senses, in a way, less directed. With architecture you don't have the problem of, for example, burning your fingers, if you touch a lamp that is too hot. But the attitude, to be conscious and aware of the relation between we humans, and the architecture, always has to be present.

**Paolo Rizzatto:** When I was working on D7, which won the Compasso d'Oro, the goal was to find the solution of how to light a room, to make a more architectural light. I was thinking about the Kandinsky book *Point*,





The Berenice luminaire (top left); the Titania fixture (middle left); the Mix lamp (above left); the Costanza and Grand Costanza (right).

Line, and Surface as a reference. The challenge was how to make a light with a long arm, a very soft movement, and with a big radius—the arm is 2 meters long and fixed to the wall—that would make a point of light that was possible to move into the space. The idea for Berenice also deals with how to illuminate a room, but the difference is the size of the lamp. Here, it is very small—a halogen bulb. The challenge is how to achieve the same quality of movement that can start and stop exactly as you move it.

**Alberto Meda:** To make a different point of light, it's important to be harmonic with the combination of different sources. It's another way of thinking about a source of light which gives you not a behavior, but a feeling.

**A|L:** How important is research as a part of the luminaire development process? Are you doing research yourself? Or working with a team?

**Paolo Rizzatto:** We're all working on it, but we're also looking to information provided by other companies that are engaged in research. For instance, if Philips puts some good lamps on the market, we must test and make a study of this new product.

**Alberto Meda:** Sometime you have an idea you would like to explore, for

example, a lamp that is easy to use and to move. First though, you have to define this idea, where to go, what is the goal, and then you can begin to investigate which is possible to achieve this goal. In the case of Berenice, the goal was to make a good connection between the arms, and to solve this problem you want to have electricity in every position. In the end it is a complex of different things. The level of research depends on what you want to achieve with the design.

**A|L:** What continues to inspire you after all these years?

**Paolo Rizzatto:** It is all of our life, all of our experience, all of our research, and our memory. Sometimes it can happen a way that can be mysterious or unconscious, other times it can be very clear and rational.

**Alberto Meda:** You don't normally start with: Today I must do this. Rather you start thinking about something years ago, and you are always to some extent thinking about it. You are always looking around to find a solution.

**A|L:** What are some of the things that interest you now?

**Alberto Meda:** We are exploring LEDs. We think that will be the future of light, but it requires some real testing.

**A|L:** Because the design of each fixture is specific to its lamp source, do you ever go back and revisit a luminaire? Would you consider modifying it with a different light source? Or does it go against how you originally thought about the light fixture?

**Paolo Rizzatto:** It's a good question. For instance, with the Berenice lamp, in the original design the bulb and the rounded glass top would get very hot, you had to be careful not to touch it. But if we modify it to work with an LED, this top part no longer gets hot to the same extent. In this instance, changing the source has in fact helped to improve the luminaire.

**A|L:** How do issues of sustainability and energy efficiency impact the design of a new luminaire and the manufacturing process? How does LucePlan address these issues?

**Paolo Rizzatto:** It's a very important problem. When I started as a student looking at the problems in architecture I was not necessarily aware of the fact that the resources of the earth were limited. I was thinking about other problems. I could never imagine we would be thinking in these terms. But now I know, and I must think about this when I make a project. This point must be one of the important elements of my project, and I must think about this as any other element in the project like the function, like the quality, the cost, the beauty. And there is also this, sometime you must make a choice—a project is always a compromise. If you have a lot of constraints it's easier to do a project, it's terrible when you make a project and you have no constraints.

For this reason we do not produce lamps in large quantities, but rather a luminaire that can have a long life. We are not interested in putting a lot of "stuff" on the market just to say we have something new.



INNOVATION: *profile*

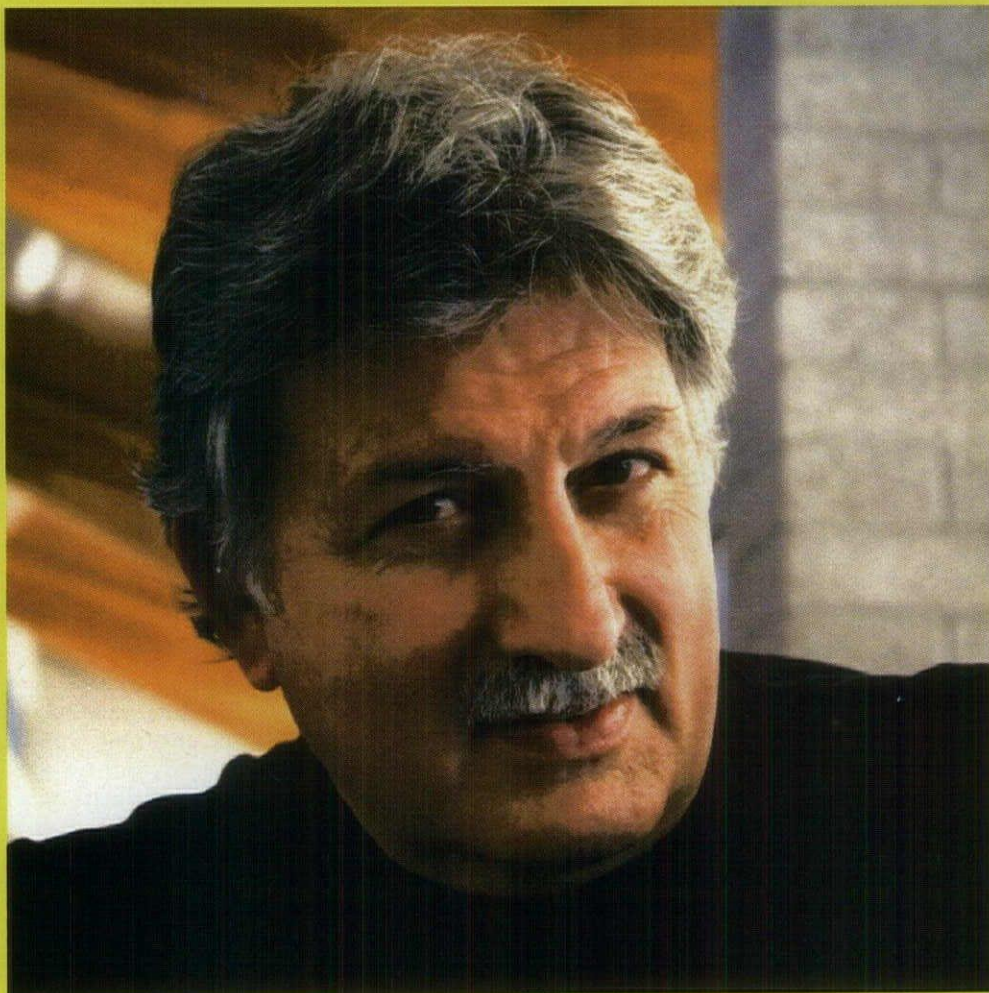
# Ed Mazria, Architect and Environmentalist

Building awareness of architecture's role in a sustainable future.

**A NEW UNDERSTANDING AND GREATER AWARENESS OF OUR** interaction with the natural environment—and just how significant it is—is helping to open people's eyes to what it means to build responsibly and sustainably. Leading the charge is the founder of Architecture 2030—architect, environmentalist, researcher, and author Edward Mazria, of Santa Fe, New Mexico-based Mazria Inc. Mazria has emerged as a particularly compelling voice in the field of architecture urging design professionals to reduce energy use and carbon dioxide (CO<sub>2</sub>) emissions in all buildings.

In 2002, while preparing for a seminar on green design, Mazria was reviewing population growth data from the year 2000 and CO<sub>2</sub> projections from the 1970s. Comparing those projections with more recent data on population and emissions, he realized that the United States had already reached many of the projected targets. This spurred Mazria to re-examine the U.S. Department of Energy (DOE)/Energy Information Administration's (EIA) official statistics on energy use and CO<sub>2</sub> emissions by residential and commercial buildings, industry, and transportation. Delving into the data, he isolated transportation and industry activities specific to the production and transport of building materials and reallocated them, along with residential and commercial construction, into a new category designated "Buildings." The result was Mazria's reapportioned, more accurate division of the EIA's statistics, which illustrated that construction materials and building operations consume 48 percent of the energy produced in the U.S. each year and 48 percent of the greenhouse gas emissions that contribute to global warming—a revealing wake-up call as to just how significant an impact architecture and construction contribute to the amount of energy use, the production of greenhouse gas emissions, and, ultimately, the effect on climate change. When presented with the numbers, Mazria says, architects were just as surprised as he was.

As a result of his research, and after 35 years of practicing environmental design, in 2005 Mazria established Architecture 2030 ([www.architecture2030.org](http://www.architecture2030.org)), a nonprofit organization dedicated to research and to providing information and innovative solutions in architecture and planning to address global climate



change. His goal is to motivate the architecture, building, and design industries to implement changes in their practices that will have a direct and immediate impact on energy use and emissions. "We know from our research that the building industry is the largest energy-consuming and greenhouse-gas emitting sector; close to double any other sector," Mazria says. "It's important for us to understand that we a large part of the problem, but we are also a large part of the solution."

In February 2007, Mazria issued a formal challenge to the architectural community,

including students and educators, as well as government officials. He and other noted climate change and design experts hosted the *2010 Imperative Global Emergency Teach-In*, an interactive webcast on global warming, climate change, and the built environment. The teach-in detailed actions for reducing human impact on the environment through building, separated into two group-targeted initiatives, the *2010 Imperative* and the *2030 Challenge*.

The *2010 Imperative* challenges accredited design, planning, engineering, and architecture schools to institute ecological literacy in design



# 2030 C

**The 2030 Challenge calls on the architecture, design, and building communities to make all new construction carbon-neutral by the year 2030.**

studio coursework at all levels so that students understand how their actions and designs impact the environment, and, in turn, how the environment can influence their designs. The initiative also prods schools to achieve carbon-neutral campuses by 2010 by implementing sustainable design strategies, generating on-site renewable power, and purchasing renewable energy or certified renewable energy credits. The *2030 Challenge* calls on the building sector to reduce emissions in new construction by 10 percent every five years and by 50 percent of regional averages in existing buildings.

The goal is for all new construction to be built carbon-neutral by 2030. "When we design something, we set up its emissions pattern for the next 50 years, or however long a building or community stands," he states.

Mazria's message has already been heard by nearly one-quarter of a million people. Numerous architectural firms, educators, and students internationally, the U.S. Conference of Mayors, individual cities and states, and industry organizations have joined or are actively supporting Architecture 2030's *2010 Imperative* and *2030 Challenge* by committing

to implementing or advocating for the initiatives in their firms, campuses, or municipalities. Last year, the American Institute of Architects (AIA) adopted the *2030 Challenge* and in May 2007 joined with Architecture 2030, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, the Illuminating Engineering Society of North America (IESNA), and the U.S. Green Building Council (USGBC), with support from the DOE, to finalize an agreement of understanding that establishes a baseline starting point for energy and emissions reductions with a goal of net-zero-energy buildings.

According to the AIA and Architecture 2030, by 2035 three-quarters of the built environment in the U.S. will be either new or renovated. In addition to the building materials required, these projects will need to be illuminated. Lighting, particularly in commercial spaces, accounts for the largest portion of a building's energy consumption. Designs that incorporate daylighting strategies and efficient use of electric lighting are a critical aspect of reducing energy consumption. To have the greatest possible impact on energy reduction, lighting designers and architects must work closely on each project to develop effective, efficient lighting plans. Lighting needs to be viewed not as a stand-alone element, but as an integrated building system.

The architectural design and building construction sectors have a monumental opportunity to make a historic contribution to resolving a global issue—halting climate change. According to Mazria, as understanding of human impact on climate change deepens, so too does the understanding that it will mandate rapid and drastic energy consumption reductions within the next 23 years. The *2030 Challenge* offers a realistic road map for an attainable plan.

*Stephani Miller is the associate web editor for Architectural Lighting magazine's website—archlighting.com. Previously, she covered building products and materials among other topics for the lumber and building materials supply chain through ProSales Magazine and for custom home builders through Custom Home Magazine, titles in Hanley Wood's portfolio of design publications.*





INNOVATION: *Daylighting / Renewable Resources*

# STEWARDS OF THE EARTH

The world's first LEED Platinum rated K-12 school teaches sustainability by example.



#### GROWING AWARENESS OF THE DEVASTATING REPERCUSSIONS OF THE GLOBAL WARMING CRISIS

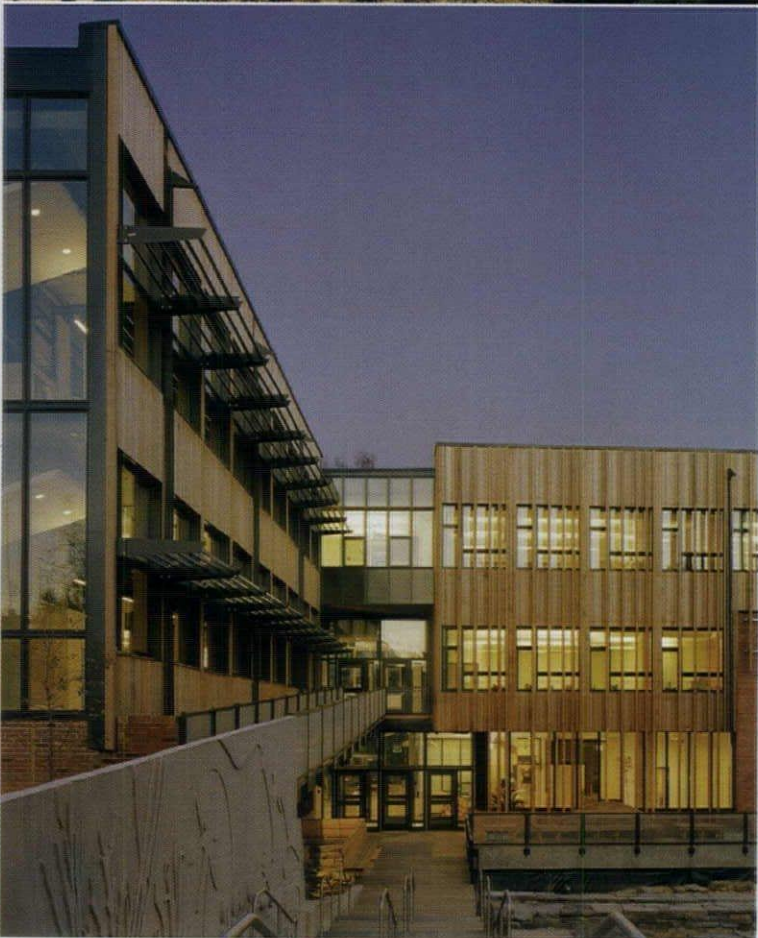
is causing people to rethink their actions, whether it be how they travel to work, what kind of products they purchase, or how spaces are designed, built, and lit. However, those of us now standing at that crossroad are light-years behind the green-minded people responsible for the newly renovated and expanded Sidwell Friends Middle School in Washington, D.C.—the first LEED Platinum-rated K-12 school in the world and the first Platinum project in Washington, D.C.

Founded in 1883, the Sidwell Friends School is a Quaker co-educational institution that has proven its commitment to environmental responsibility throughout its existence. The school's curriculum is based on the belief that students must acquire a deep appreciation for the natural world and recognize the implications of their relationship with it. So when the directors of the school decided to expand the existing Middle School, they saw an opportunity to express and embody the core values of the institution.

Guided by the Quaker principle of stewardship to the Earth, Sidwell Friends hired Philadelphia-based KieranTimberlake Associates (KTA), a firm known for its research and innovation, to head the project. KTA was charged with transforming the undersized existing 55-year-old Middle School into a 72,000 square foot state-of-the-art sustainable teaching environment. Completed in 2006, the Middle School serves as a dynamic demonstration of the broader network of systems that support any such complex. These systems, including storm water management, wastewater recycling and solar electricity generation, typically hidden from users are exposed at the new Middle School, allowing students to observe and quantify their interrelationship with natural resources, the local habitat, and the built environment. Sidwell Friends' desire to not only maximize green systems, but also to readily reveal them was integral to their concept for the expansion. According to KTA's Richard Hodge, project architect, "The integration of demonstration into the mix was unique, as was the client's ambition to make LEED a part of the school's curriculum." To that end, KTA worked with the Lucid Design Group to develop a monitoring and display system that allows students to interact with the school's living systems through an internally hosted website providing both real-time and historical data pertaining to the overall performance and health of the building and its individual systems.

Among the Sidwell Friends' many innovative green components is a constructed wetland—the first of its kind in the District of Columbia—that receives and biologically cleans the school's wastewater and returns it to the building's ecosystem to serve as grey water for the toilets and cooling systems. The school also hosts a green roof, developed in part as an outdoor classroom, which filters rainwater that feeds a biology pond and supports natural habitat. Solar chimneys located alongside the green roof provide passive ventilation and roof-mounted photovoltaic panels provide 5 percent of the electrical demand for the building. Additionally, a large percentage of the materials used in the renovation and new construction of the Middle School are composed of recycled, natural, locally produced or rapidly renewable materials. One example is the western red cedar reclaimed from fifty-year-old wine casks used for the vertical fins that enliven the addition's façade and the third floor of the existing building.

As impressive as these green features are, the lighting design, and in particular, the daylighting of the Middle School was a key aspect in creating a truly sustainable building. The success of Sidwell's lighting program is thanks to the partnership and ingenuity of Sean O'Connor, of Sean O'Connor Associates Lighting Consultants, and Jim Benya, an internationally recognized expert in daylighting and sustainable lighting design. Working as a team, O'Connor took on the role of lighting designer, while Benya assumed the role of daylighting designer, which also included responsibility for certain aspects of the challenging site master planning. As Benya describes, the southwestern orientation of the existing building was, "The biggest daylighting challenge of the project." However, through analysis of site and use patterns, O'Connor and Benya realized that the most devastating solar gain would occur after three o'clock in the afternoon—when school was out. This allowed the designers greater flexibility in their daylighting solution. According to Benya, the characteristic red cedar fins on the façade were "essential to making this building work from



A good neighbor, the Sidwell Friends Middle School gracefully occupies its suburban Washington, D.C. site (facing page). Solar chimneys reduce the need for mechanical heating and cooling, and serve as sculptural elements for the outdoor rooftop classroom (top). Western red cedar, reclaimed from fifty-year-old wine casks, are used for the vertical fins of the new addition's façade and third floor of the existing building, but they are far from decorative; the fins allow sufficient diffuse light, but prevent direct solar sun from entering the building (above).



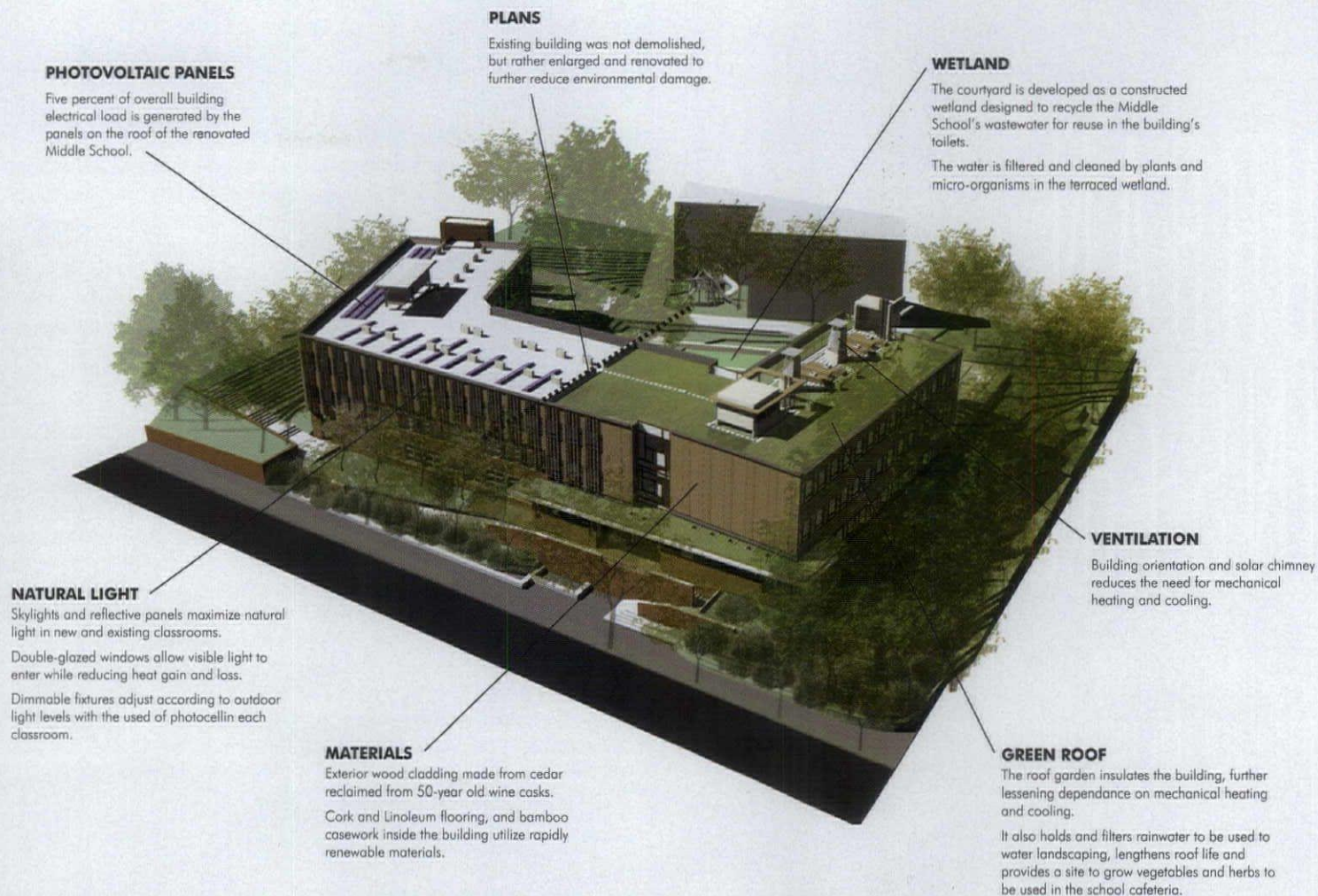


**Creative uses of architectural surfaces channel light throughout the building (above left). The library is illuminated with an abundance of natural light, balanced with carefully placed electric sources (top right). Custom-designed classroom pendant light fixtures offer two modes of functionality: lecture mode for general classroom use with uplights, and AV mode with minimal downlights for presentations (above right). A diagram outlining the project's sustainable features (facing page).**

a daylighting standpoint." Through careful calculations and extensive modeling, a precise angle was determined for the fins that would allow sufficient diffuse light from the sky, but prevent direct solar sun from entering the building before 3pm. While the classrooms also have interior shading systems, the fins are critical in keeping the solar sun, and therefore the heat, from entering the classrooms. These fins, in combination with modest glazing, create a classroom environment that can function solely with daylighting for the majority of the year.

Benya's extensive daylight modeling was critical to obtaining the LEED Platinum rating for the school. Using a combination of software programs, AGI32 and Lumen Micro 2000, Benya was able to closely determine the behavior of the building throughout the course of the year, and subsequently calculate and predict how the building would perform overall. Importantly, these figures allowed Benya to measure if the building would comply with the LEED daylighting credit. According to Benya, "Getting all of the classrooms to meet the daylighting credit was an essential part of how we got LEED Platinum."





**PHOTOVOLTAIC PANELS**  
Five percent of overall building electrical load is generated by the panels on the roof of the renovated Middle School.

**PLANS**  
Existing building was not demolished, but rather enlarged and renovated to further reduce environmental damage.

**WETLAND**  
The courtyard is developed as a constructed wetland designed to recycle the Middle School's wastewater for reuse in the building's toilets.  
The water is filtered and cleaned by plants and micro-organisms in the terraced wetland.

**NATURAL LIGHT**  
Skylights and reflective panels maximize natural light in new and existing classrooms.  
Double-glazed windows allow visible light to enter while reducing heat gain and loss.  
Dimmable fixtures adjust according to outdoor light levels with the use of photocell in each classroom.

**VENTILATION**  
Building orientation and solar chimney reduces the need for mechanical heating and cooling.

**MATERIALS**  
Exterior wood cladding made from cedar reclaimed from 50-year old wine casks.  
Cork and Linoleum flooring, and bamboo casework inside the building utilize rapidly renewable materials.

**GREEN ROOF**  
The roof garden insulates the building, further lessening dependence on mechanical heating and cooling.  
It also holds and filters rainwater to be used to water landscaping, lengthens roof life and provides a site to grow vegetables and herbs to be used in the school cafeteria.

Equal care also was given to the design of the electrical lighting for the Middle School. As O'Connor explains, they took an atypical approach to the electrical lighting design, focusing on "watt hours, rather than watts per square foot" and reducing the need for electric lighting through the creative utilization of architectural surfaces and relights, such as the light shelves located in many of the corridors that channel light over the hallways and onto the ceilings of classrooms with less beneficial exposures.

Custom light fixtures were designed for the classrooms as well. Notable for their simplicity and efficiency, these luminaries offer only two modes: lecture mode for general classroom use with uplights, and AV mode with minimal downlights for presentations requiring restricted lighting conditions. As an energy efficiency safeguard, the fixtures are designed so that only one mode can run at a time. Furthermore, during lecture mode daylight sensors automatically regulate the system, brightening or dimming the fixtures as necessary. This system also reduces user error, with teachers only needing to select the desired mode.

Selected by the American Institute of Architects Committee on the Environment as one of their Top Ten Green Project for 2007, the Sidwell Friends Middle School serves as an example not only to the student body and local community, but to all, of what is possible when a commitment to protecting the environment and preserving natural resources is made. As Benya keenly argues, there was nothing "exotic" about the solutions implemented at Sidwell Friends or extraordinary about the budget, and therefore, as he explains, it should serve as a "workable prototype for what every school building could easily be. The reason we don't think in these terms is that we haven't had to." But the time of not considering these issues is quickly drawing to an end, and thankfully institutions like the Sidwell Friends Middle School are setting an example that makes it very difficult to ethically justify or accept traditional (and often comfortable) approaches to designing the built environment. As Benya states, "There is simply no excuse not to do it." **MARGARET MAILE PETTY**

## DETAILS

- PROJECT** Sidwell Friends Middle School Addition, Washington D.C.
- CLIENT** Sidwell Friends School, Washington D.C.
- ARCHITECT** KieranTimberlake Associates, Philadelphia
- LIGHTING DESIGNER** Sean O'Connor Associates Lighting Consultants, Los Angeles
- DAYLIGHTING CONSULTANT** Benya Lighting Design, West Linn, Oregon
- STRUCTURAL ENGINEER** CVM Engineers, Wayne, Pennsylvania
- MEP ENGINEER** Bruce Brooks & Associates, Philadelphia
- LANDSCAPE ARCHITECT** Andropogon Associates, Philadelphia
- WETLAND CONSULTANT** Natural Systems International, Santa Fe, New Mexico
- SUSTAINABLE DESIGN CONSULTANTS** Green Shape, Washington, D.C.; Integrative Design Collaborative, Arlington, Massachusetts
- CIVIL ENGINEER** VIKI, McLean, Virginia
- GEOTECHNICAL** ECS Mid-Atlantic, Chantilly, Virginia
- INFORMATION DISPLAY** Lucid Design Group, Oakland, California
- COMMISSIONING AGENT** Engineering Economics, Arlington, Virginia
- EXTERIOR WALL CONSULTANT** Simpson Gumpertz & Heger, Rockville, Maryland
- PHOTOGRAPHERS** Peter Aaron/Esto (page 28 and 30, left); Barry Halkin, (page 29 and page 30, right top and bottom)
- PROJECT SIZE** 39,000 square feet
- MANUFACTURERS** Architectural Area Lighting, Artemide, Bartco, B-K Lighting, Con-Tech, Energie, Erco, Finelite, Focal Point, Forum, Hevi Lite, Kurt Versen, Lightolier, Lithonia, Lutrex, Lutron, Mercury, Metalux, Rambusch, Selux, Smedmark, Zumtobel



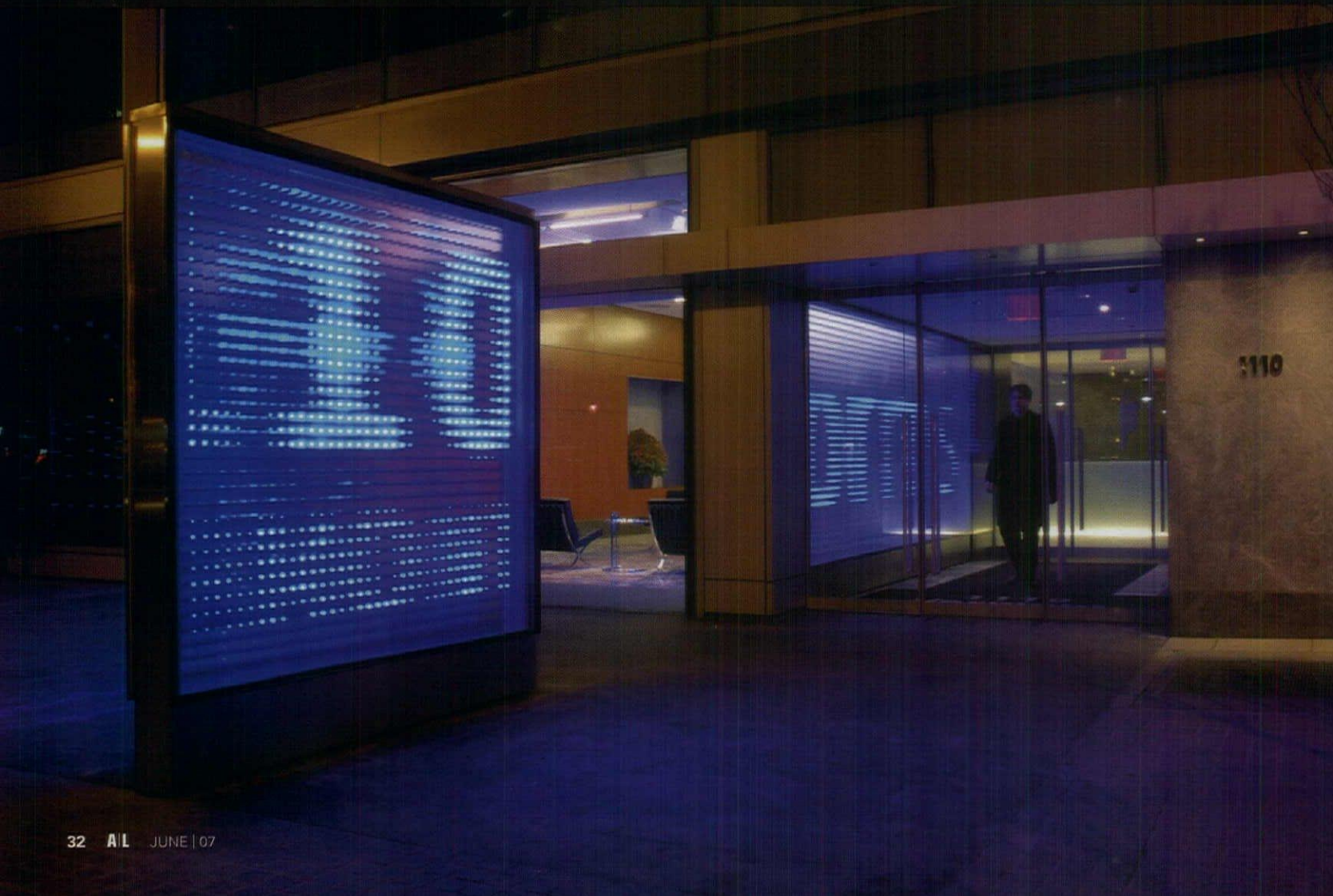
# URBAN INSTRUMENT

AN INTERACTIVE LIGHT AND SOUND PUBLIC ARTWORK  
SETS A NEW TONE FOR WASHINGTON DC'S STREETScape.

ON A FAIRLY NON-DESCRIPT STREET IN WASHINGTON D.C.'S DOWNTOWN BUSINESS DISTRICT SITS A not so undescrpt public artwork. Commissioned by the building developer as part of an overall refurbishment for the 1970's office building he purchased, *Low-Rez/Hi-Fi*, as the piece is called, adds vibrancy to the streetscape and turns a rather mundane building into something distinctive. The project consists of LED pixel nets encased in glass vitrines—one on the sidewalk and two in the building's lobby interior, and a grove of stainless steel poles, which emit sound. The collaborative work of architects Meejin Yoon and Eric Howeler, and engineer Will Pickering, *Low-Rez/Hi-Fi* takes the design-build idea to a new entrepreneurial level. Fabricated and hand-assembled by the team themselves, the construction of the individual pieces is a feat unto themselves and every bit as interesting as the finished installation.

The project explores imagery, levels of transparency, and interaction. Because the LEDs are addressable, specific patterns can be programmed, in this instance the building's address digits—1110. Added to this is a background image of scrolling ones and zeros. As Eric Howeler explains, "When a viewer approaches the vitrine, a surveillance camera captures his or her image, adjusts the contrast and send the signal to the LED net. The 'live feed' will broadcast the image on the net, forming a 'digital shadow' in real time."

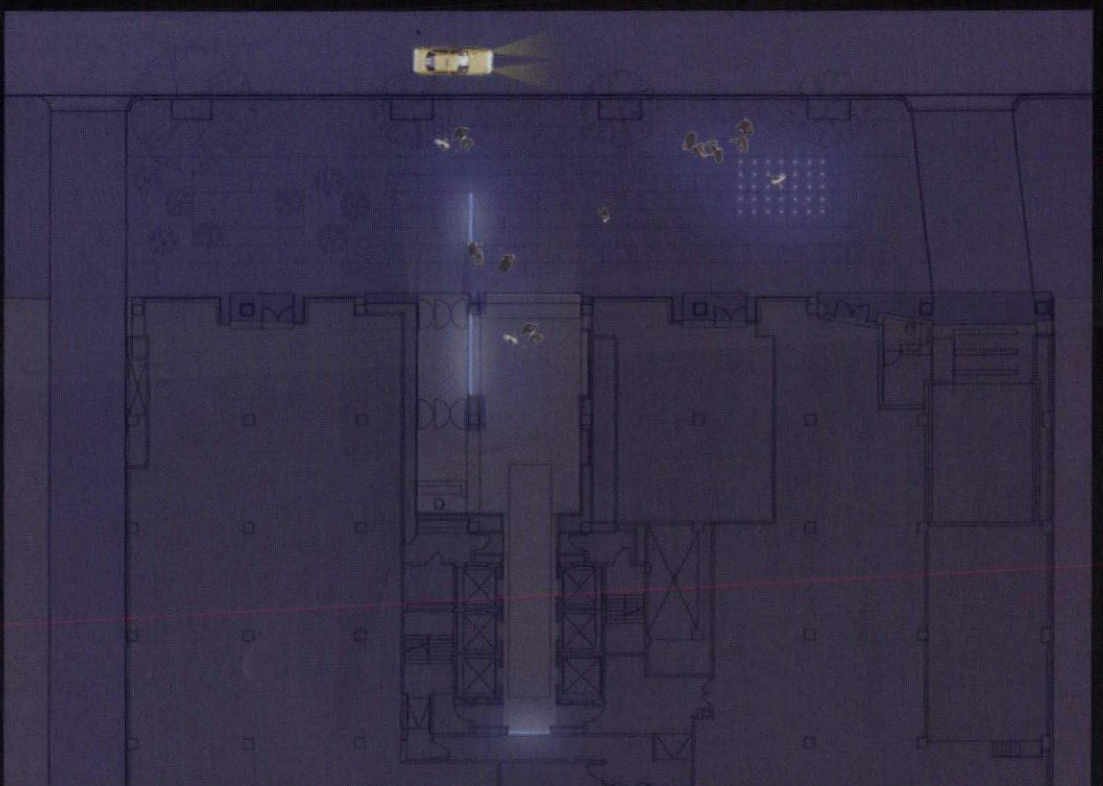
The second component of the project is the "Sound Grove," a field of 20 interactive poles that emit sound in "response to touch" and is a further evolution to the ideas originally explored in the firm's piece *White*







The project's zones of illumination are visible in the site plan, which shows the location of the three LED light vitrines—two inside the lobby and one on the street—and the Sound Grove grid cluster (left). The interactive LED net broadcasts the building address (1110 Vermont) through a series of suspended LED pixels. In turn, the content of the LED screen is overlaid with the live feed to form a "digital shadow" (below and facing page).





*Noise, White Light* commissioned for the 2004 Athens Olympics (See "Highlights: White Noise, White Light," Sept/Oct 2004). Accenting the poles are blue LED illuminated rings, which connect the piece visually to the LED vitrines of the same coloration.

Straddling the boundaries of public and private, inside and outside, individual and collective, *Low-Rez/Hi-Fi*, challenges our notion of the traditional streetscape inviting people to, as Howeler + Yoon describe—play. The result is a far more engaging urban realm in which we are confronted with sight and sound and forced to think about our interaction with the built environment—to be an active participant rather than just merely an observer. **ELIZABETH DONOFF**

## DETAILS

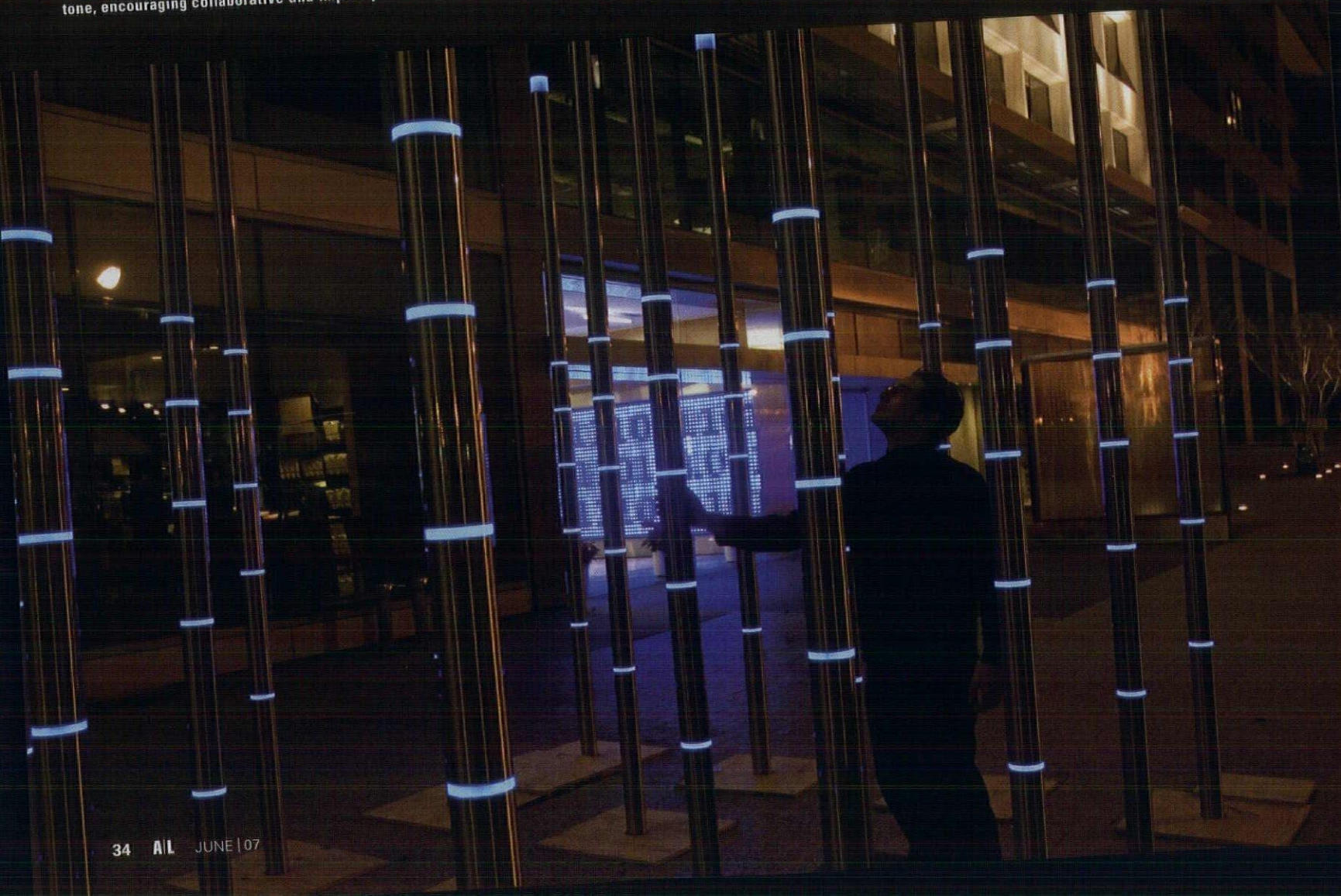
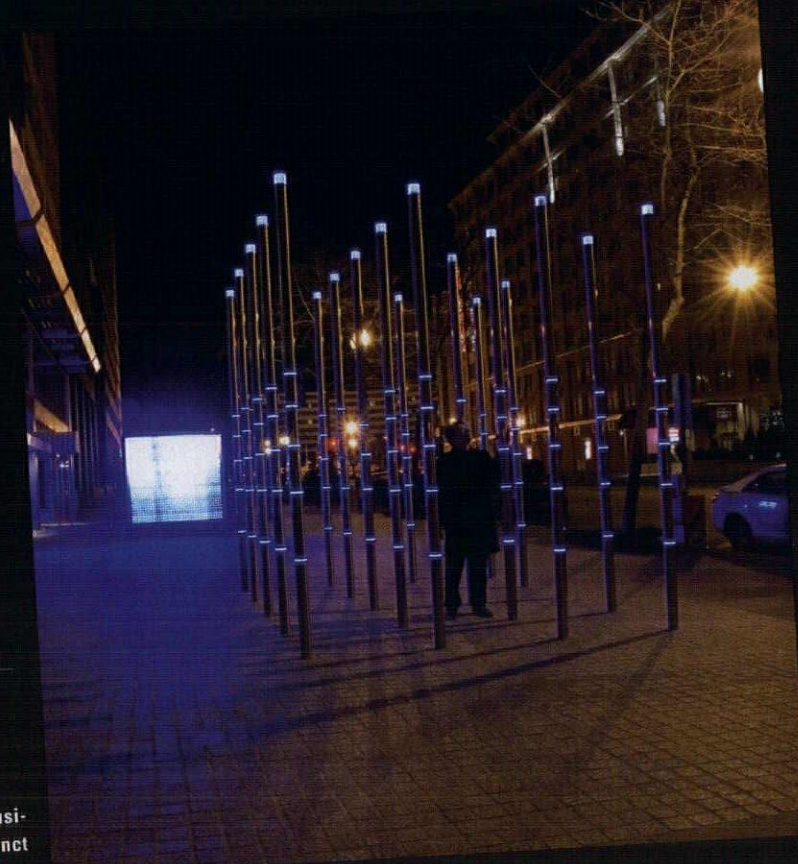
**PROJECT** *Low-Rez/Hi-Fi*, Washington D.C.

**ARCHITECT** MY Studio / Howeler + Yoon Architecture, Boston

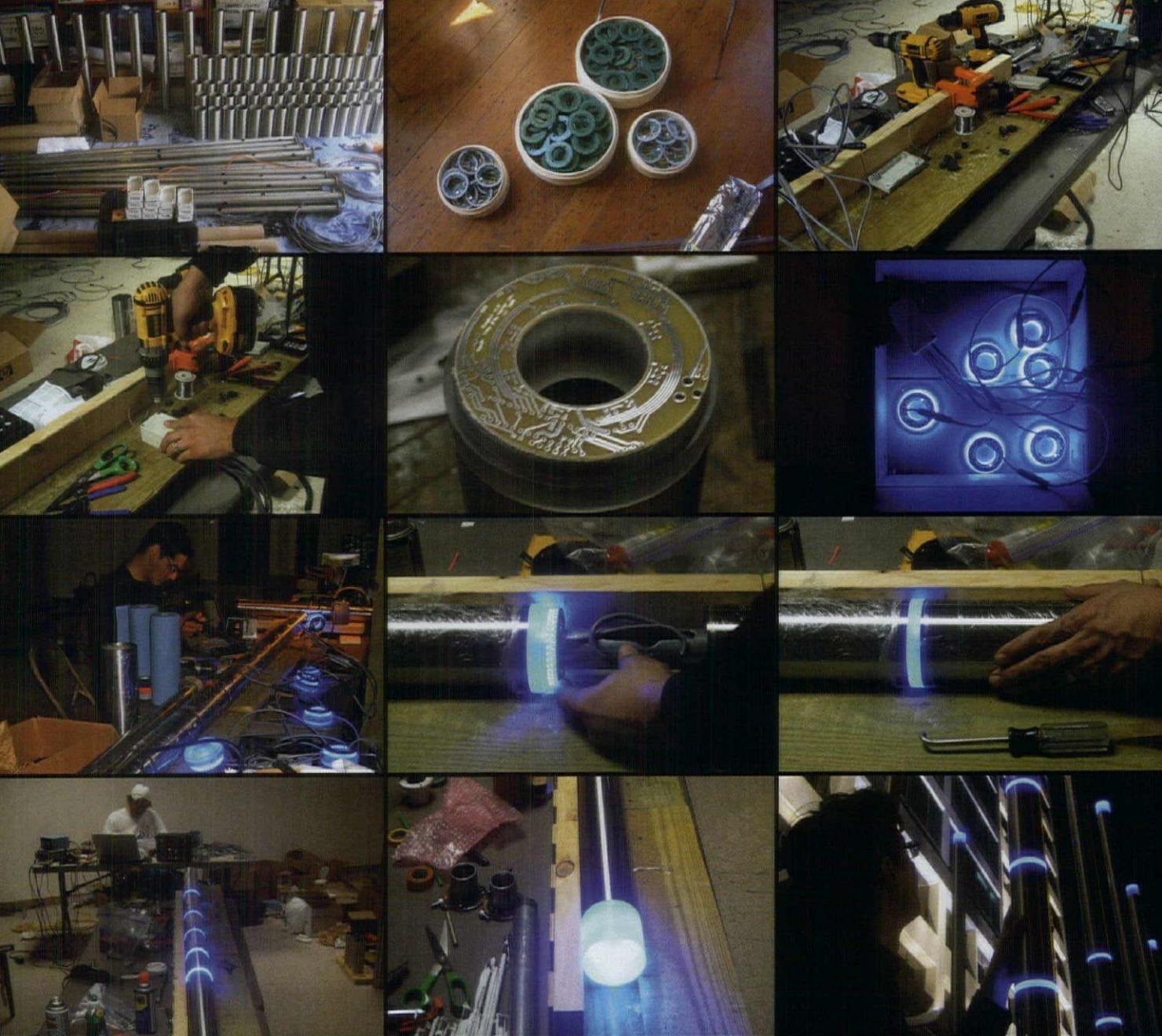
**ENGINEERING AND FABRICATOR** Will Pickering/Parallel Development, Brooklyn, New York

**IMAGES** Courtesy of Howeler + Yoon Architecture

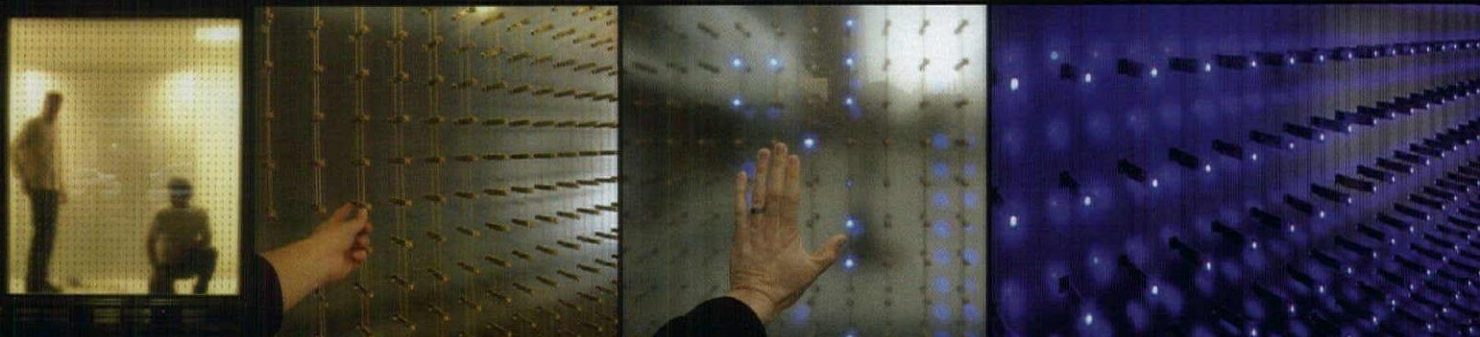
The grid of poles emit sound in response to touch, acting as a real-time urban musical instrument. Each "stalk" consists of multiple segments, each with a distinct tone, encouraging collaborative and impromptu compositions (below and right).







The actual fabrication and assembly of the light poles and LED strings for the vitrines is the result of an extraordinary collaboration between the architects and the engineer. In a painstakingly detailed process, the team built the project components from scratch, and individually tested each element (images this page).





INNOVATION: LEDs | Environments

# LIGHT TAKES FLIGHT

*The latest technological advancements afford true in-flight comfort to enhance the flying experience.*

FEW WOULD DISAGREE THAT AIR TRAVEL HAS BECOME NOTHING SHORT OF INTOLERABLE. WITH FREQUENT DELAYS, long security lines, cramped seats, and cabins that are, in a word, claustrophobic, it is no wonder that passengers just want to put on their headphones and sleep the flight away. But now, with a newly designed airplane, Boeing has taken advantage of the latest innovative technologies—of which lighting is a major component—to offer an in-flight experience worth waiting for.

Announced in December 2002, the 787 Dreamliner is an opportunity for Boeing to focus on a new, super-efficient twinjet airplane. Launched with an order for 50 aircraft, major assembly of the plane did not begin until June 2006, with final assembly beginning in May 2007. Perhaps the most important part of the design process, the company looked to travelers for input and conducted a survey to poll their in-flight feelings and frustrations. As Blake Emery, director of differentiation strategy for Boeing Commercial Airplanes, says, "We have spent over a decade learning what makes the flying public feel good." Through focus groups, scientific studies, and research in Europe, Asia, and North America, Boeing discovered that "people want space, they like windows, and they want to arrive at their destination feeling relaxed."

With this criteria in mind, the company, along with Seattle-based industrial design firm Teague, which has worked with Boeing for over 60 years, set out to design an airplane interior with passenger experience as its No. 1 priority—an aircraft that would not only redefine air travel, but provide an opportunity to change the way Boeing does business, specifically through a new, highly collaborative business model. Used throughout the design, development, and build phases, the new method ensures that the best ideas and abilities from the industry are used to create a product like no other, faster and more efficiently than ever. Touted to be the most advanced and efficient airplane in its class (meaning a midsize aircraft with long-haul ranges), the 787 Dreamliner represents a dramatic departure from the air-travel experience that passengers have grown to accept simply by default.

The first sensation passengers will encounter upon entering the newly designed aircraft is spaciousness. Resulting from a combination of the airplane's new architecture, its dynamic lighting scheme, and large windows

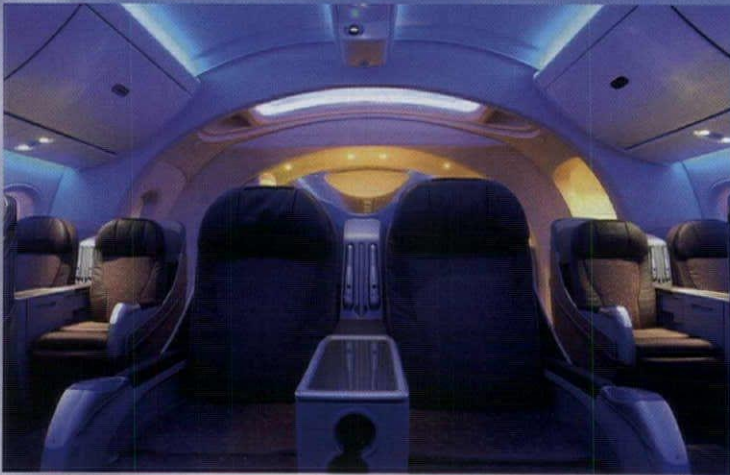


Regardless of seat assignment, passengers aboard the Boeing 787 Dreamliner will enjoy an increased sense of spaciousness due to the airplane's higher ceilings, wider aisles, and larger windows (above).

that provide substantial natural light and views, the open and simplified layout is the foundation for comfort. As Kenneth Dowd, vice president of Teague Aviation Studio, explains, "The lighting and ceiling construction combines in a way that make it very difficult for passengers to judge the distance to the ceiling," therefore visually expanding the space. The entryway ceiling is, in fact, significantly higher than that of a comparable aircraft, at 9 feet high versus 6 feet, 8 inches. As for the overall effect of the cabin, Emery says, "The integrated whole of the 787's interior is much more than the sum of its parts—passengers will notice they are much more comfortable without necessarily noticing each design element."

From the tall entryway, vaulted arches appear repeatedly along the





**A "simulated sky" ceiling treatment created by arrays of LEDs (programmed to change from a daylight scene to a nighttime presence) connects travelers to the experience of flight (above).**

cabin, dividing the plane's interior into sections and emphasizing the soaring ceiling, while serving an important architectural function. "They give the passengers the sense that they are in a well-proportioned room," says Dowd. By integrating light into these architectural curves, significant improvements to passenger experience could be made, in addition to an interior that would invoke the sense of flying. "People are fascinated with the flying experience," explains Emery. "They want to feel connected to the experience of flight as it happens."

Perhaps most central to this theme is the airplane's main lighting feature, a "simulated sky" created by arrays of RGB LEDs and designed to provide a more restful environment. This sky-like ceiling treatment contin-

ues throughout the entire cabin and imparts "a subtle yet persuasive sense of having the sky overhead," says Emery. Throughout the duration of any flight, the ceiling can be set to a bright daylight scene or a peaceful nighttime presence, with the flight attendants in control of any number of pre-programmed scenarios.

The airplane's windows also play a significant role in the open, spacious feel of the cabin. Again consulting with travelers to gauge their reactions to various window options, Boeing found that passengers prefer larger windows. At 65 percent larger than those in competing airplanes, the windows on the Boeing aircraft, which measure 11 inches wide by 18 1/2 inches tall, enhance the cabin's airy atmosphere, allow natural light to flood the space, and offer passengers a view to the horizon from any seat on board, thus "reinforcing their connection to the flying experience," explains Dowd. But that's not all. Electrochromic technology eliminates the need for traditional pull-down shades. Using electricity to darken an electrically conductive medium between two layers of glass, the technology allows passengers to "dim" the window while maintaining high vision clarity at all transmittance levels, sustaining views to the passing terrain and reducing glare—all at the touch of a button located on the cabin wall and centered under the window itself.

From a vaulted ceiling moonlighting as sky to tunable windows, passengers' other cabin frustrations have also been addressed through a suite of new technologies. These include the cabin's air circulation system, pressurized to a lower altitude (down to 6,000 feet from 8,000 feet) to provide more moisture in the air; sensors on the aircraft's nose that enable the control surfaces (such as the rudder and spoiler) of the airplane to respond to turbulence and adjust for a smoother ride; and a new gaseous filtration technology that offers increased humidity and cleaner air.

For Boeing, which has sold 567 planes to 44 customers—the majority of which are airlines, though some are other entities such as leasing customers—to date, the 787 Dreamliner may be the answer to travelers' woes. And with an aircraft that offers substantial improvement in cabin comfort, perhaps travelers will now want to remain awake, gazing at the sky above or taking in the expansive view outside. **SALLIE MOFFAT**









Starting at the entryway (facing page), vaulted arches appear repeatedly throughout the airplane cabin, emphasizing the soaring ceiling while creating well-defined architectural boundaries. The new interior configuration also features strategic cabin breaks, including a galley (left), providing passengers with defined areas in more room-like proportions. The dynamic lighting scheme continues throughout the cabin, from business class to coach (above).

#### DETAILS

**PROJECT** Boeing Commercial Airplanes' 787 Dreamliner

**INTERIOR/LIGHTING DESIGN** Boeing Commercial Airplanes, Seattle; Teague, Seattle

**PHOTOGRAPHS** Jim Coley, the Boeing Company except where noted

#### MANUFACTURER

Diehl Luftfahrt Elektronik  
PPG Aerospace  
Securaplane

#### APPLICATION

Main cabin lighting  
Electrochromic windows  
Wireless emergency lighting system





Photography by Hedrich Blessing, Ltd.



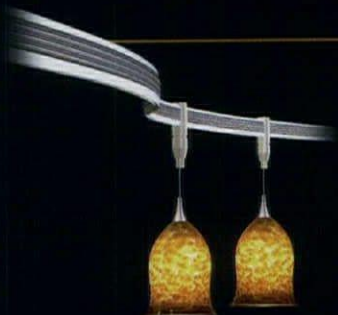
Shaper 693 sconces and 494 pendants illuminate the Oakland City Government Administration Building.

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**Shaper™ 329 Silk Pendant**

Part of the Farallon collection, the 329 Indirect Pendant features a Curved Triangular Glass Plate with Gold, Silver or Copper Leaf. Available in a variety of sizes and finishes.



**Shaper™ Umbra Wall**

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## FAÇADE LIGHTING: A FORK IN THE ROAD?

TODAY, FAÇADE LIGHTING DESIGN STRATEGIES SEEM TO FOLLOW two diverging paths: One emulates the work of nature—the moon and the sun—while the other embraces the possibilities of latter-day technology. For any given project, a lighting designer tends to operate with either a “naturalist” or a “technologist” mindset, though the approaches can overlap considerably. In the best cases, each hopes to imbue the building with not merely skilled illumination, but a higher level of meaning.

Witness the proliferation of media façades—the often pixilated, animated billboards glowing brightly in many cities around the world. They range from the exuberant, as at Skidmore, Owings & Merrill’s supergraphic Jianianhua Center in Chongqing, China, to the ethereal, such as Herzog & de Meuron’s soft rhomboid checkerboard on Allianz Arena. These examples, and more like them, use façade lighting not merely to illuminate or to advertise, but to convey information of interest to the entire community—and to describe goings-on within the buildings.

For Herzog and de Meuron, the stadium’s puffy exterior required “a certain differentiation” that would reflect the interior of the stadium on the outside.” That’s why the fabric enclosure glows blue for one soccer team and red for another. At Jianianhua Center, the billboards promote not a product, but state holidays.

Many lighting designers have become wary of using dynamic light just for aesthetics, like a sort of electronic wallpaper. “You have to have a reason for it. It needs to convey a message,” argues Mark Hensman, the British lighting designer whose London-based firm Equation Lighting Design created the scheme for Spinnaker Tower in Portsmouth, England, on which color-changing projectors tell the port town’s residents the level of the tide or, on foul-

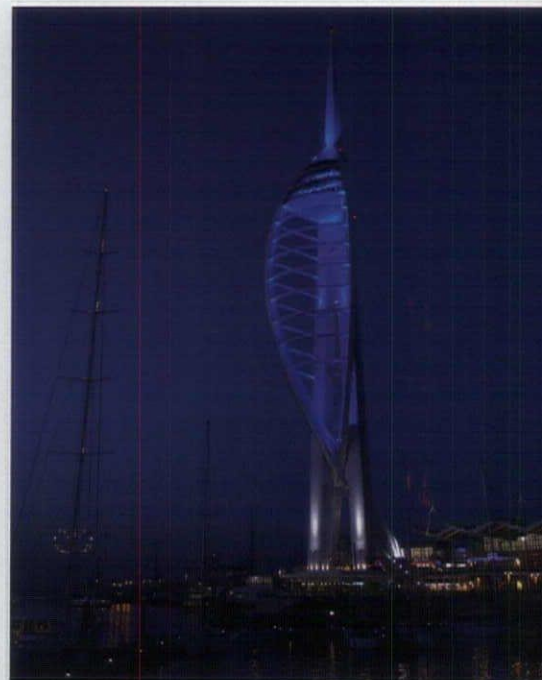
weather days, wind speed.

The permanent art installation *Weather Patterns* at the York Art Gallery in England takes the notion a step further, examining “the effects humans have on the environment”—namely, global climate change. Ornate, spiral-shaped low-resolution displays are framed within the windows of the museum’s 1879 Italian Renaissance-style building. Otherwise, the façade lighting is unremarkable; surface-mounted floodlights cast long shadows upward from the capitals and arches, exaggerating the building’s proportions.

Master lighting designer Howard Brandston set the standard with his highly regarded naturalistic approach to façade lighting, which first recreates the cool glow of a full moon on important civic structures. Then architectural features are carefully highlighted to coax warm interior illumination out of windows and archways. Such treatments for the University of Pennsylvania in the 1970s and the Statue of Liberty in 1986 influenced a generation of lighting designers.

One such acolyte, New York-based lighting designer Randy Sabedra, invoked Brandston’s mantra at the May 2007 relighting ceremony for New York City’s Custom House, which Sabedra conceived. Just as with the “technologist” approach, current design standards and cutting-edge fixtures and lamps are critical for successful “naturalist” lighting, Sabedra notes—as is depth of meaning for every design decision made. But the overriding message is far simpler and subtler than what most electronic billboards aim to say. “Incorporate the play of light as seen in nature,” says Sabedra. “Buildings have activity inside. The façade lighting should let that come outward.”

*C.C. Sullivan is an author and communications consultant specializing in architectural technology.*



From top to bottom and left: Spinnaker Tower, Portsmouth, England; *Weather Patterns*, York Art Gallery, England; Allianz Arena, Munich, Germany; Jianianhua Center, Chongqing, China.





## CUSTOM HOUSE, NEW YORK CITY

### DETAILS

**PROJECT** | Alexander Hamilton U.S. Custom House Relighting, New York City

**CLIENTS** | Smithsonian National Museum of the American Indian, U.S. General Services Administration

**DESIGN TEAM** | RS Lighting Design, Brooklyn, New York (lighting design); Patricia DiMaggio, Osram Sylvania (project facilitator)

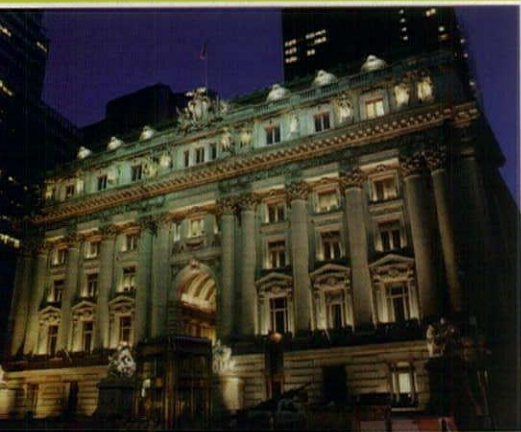
**PROJECT SIZE** | 2,000 square feet

**WATTS** | 4 watts per square foot

**PHOTOGRAPHER** | Tom LaBarbera

**RENDERINGS** | Randy Sabedra, RS Lighting Design, Brooklyn, New York

**MANUFACTURERS** | Hydrel, io Lighting, Osram Sylvania, Selux



**CHALLENGE** The Alexander Hamilton U.S. Custom House, a 1907 Cass Gilbert masterpiece at the southernmost tip of Manhattan, contains many treasures. Portraits of explorers and carved wooden screens in the old collector's office vie to capture the visitor's eye, often losing out to the colorful fresco cycle of ocean liners adorning a Gustavino vault in the huge oval rotunda. But visitors need not enter what is now the Smithsonian's National Museum of the American Indian to appreciate its Beaux-Arts grandeur. Flanking the north-facing grand entry stair stand regal female figures of Daniel Chester French's *The Four Continents*; surrounding them are Greco and Roman columns, pilasters, cartouches, more figures, and intricate arches.

During the day, that is. For years, this jubilant, layered composition fell relatively silent at night, a casualty of weak façade illumination. Excessive shadows and hot spots from metal halides confused the piano nobile. Incandescent and fluorescent fixtures at the sixth floor contrasted in a yellowish light, while mercury lamps turned the mansard roof a sickly green. *The Four Continents* turned dark each night in an alarming silhouette.

Yet rectifying the lighting scheme seemed straightforward to Randy Sabedra, principal of RS Lighting Design in Brooklyn, New York, who had trained with Howard Brandston, known for his seminal projects—relighting the Statue of Liberty (1986) and the New York Public Library (1995), work that has earned international renown and has come to set the standard in façade and monument illumination.

activity inside, and we can let that come outward—the warm glow of the interior,” he explains. “The illumination of interior surfaces would extend outward to highlight façade openings, overhangs, and details.”

Sabedra's scheme also adds definition to the building's architectural features at night, highlighting important elements. The mansard's window frames, for example, each have a dedicated surface-mounted 39W PAR metal halide spotlight. The rest of the windows have hidden in their ledges 45W angled grazer strip fixtures with high-output LEDs.

One hundred years ago, this lighting scheme might have been accomplished entirely with incandescent lamps, but Sabedra's palette is thoroughly modern. The mansard roof takes 39W PAR metal halides. The “moon glow” effect radiates from 1000W ceramic metal halide floodlights, some mounted on surrounding buildings, providing a CRI of 85. Yoke-mounted surface floodlights train 39W and 70W PAR lamps through colored glass spread lenses at wall areas. Another series with 20W lamps accent pink granite figures standing on the sixth-floor cornice line. The high-output LED fixtures tucked inside ledges appear integral to the building, tuned to 3000K and aimed at 30 degrees or 60 degrees with a grazer distribution.

The entry welcomes with a generous yet very efficient luminosity: Tiny LED “puck” fixtures are concealed below glass panels at the Corinthian columns' bases, while two rows of LEDs upright



**ARCHITECTURAL AND LIGHTING SOLUTION** The first inspiration for Sabedra, in solving the lighting design, was the light condition expected to occur naturally on a picture-postcard evening. “Heavy moon glow is a common way of lighting cultural buildings in a city,” Sabedra explains. “The structures are usually low, with the urbanscape behind them, so there's a lot to compete with.” Both conditions affected the Custom House, so Sabedra considered several schemes for casting a cool, lunar light across the heavily ornamented walls. In fact, nodding to the depth of the neoclassical façades and the cultural trove they contain, he planned to highlight the window openings with “inside light” as well. “The building itself had

the vault from their capitals. Behind the noble figures of *The Four Continents* on the sidewalk level are 67.5W upright grazers, with matching fixtures in the pits to each side.

“Cass Gilbert's sculptures can now be seen at night as if they were lit from the building itself,” Sabedra comments. “For views from afar, the entire building and streetscape are bathed in a cool glow of heavy moonlight.” The result reinforces the former prominence of the Custom House—the biggest local source of revenue—and its northward-facing stance, turning its back on the harbor. It faces instead Bowling Green, the city's first parade grounds and park, and its admiring public. **c.c. SULLIVAN**



## CHANEL GINZA, TOKYO

**CHALLENGE** The idea for Chanel's ritziest location in Tokyo was by no means simple. The façade would at once serve as communications media, daylighting source, and fashion icon—plus it would need to allow views between interior and exterior at all times. The design team, led by Peter Marino + Associates Architects, envisaged a 10-story-high media wall, flashing messages and patterns by means of an LED system.

Working with Matthew Tanteri, principal of New York City's Tanteri + Associates, Marino had created boutiques for Chanel around the world, incorporating innovative lighting schemes such as pixilated LED walls. For the Ginza location, Marino hoped to wrap the building in a high-tech version of the fashion house's signature tweed.

Yet this active, communicating curtain wall would be unusual both in scale and in the required level of functionality. The 215-foot-tall, 10-story façade, which encloses (from top to bottom) a restaurant, offices, exhibition and concert venues, and three floors of high-end retail—all capped by a rooftop garden. Views and daylight were priorities, but not at the expense of solar heat gain.

On top of it all, the architectural concept was to treat the building as a means of expression, says Tanteri. "The important thing it had to achieve was becoming media, rather than a fixed graphic," he explains. "So while the façade also acts as lighting for the building, it's a communication tool with imagery, logos, and branding."

**ARCHITECTURAL AND LIGHTING SOLUTION** Resolving this ambitious concept led to a mix of solar-control glazings and optical materials in a three-layer wall system with integrated white LEDs. Electrochromic glass—which changes in opacity depending on a current applied through the material—became a means to achieve the many competing functions of the illuminated walls. During the day, the glass turns transparent; at night it changes to translucent, making the

building surfaces essentially a large backlit screen. A double layer of gray-tinted Low-E laminated glass provides solar control.

The textile quality of skin comes from a kind of stainless-steel mesh set within the triple-glazed wall units. The diamond-cell louvers of the metal layer provide the tweed association sought by the architect and Chanel executives. But they also offer another layer of solar shading and, even more important, serve to control light spill from each pixel of the white LED array, which lies interior to the triple glazing, just outside a motorized canvas roller shade.

Arriving at this elegant, highly integrated curtain-wall assembly was by no means easy. "We played around with numerous light effects and narrowed it down to a few materials that gave you the most functionality and depth of light effect," Tanteri recalls. The result was a highly distilled version of several mock-ups and design solutions.

While the façades and the effects they produce are sophisticated, the LED array itself is elegant and simple. Tubes spanning small vertical supports contain four rows of LEDs with a mix of narrow and wide beam spreads; two are aimed up and two point down, and the combined light of 72 LEDs constitutes a single 8-inch-wide pixel. The main façade is 188 pixels tall by 98 pixels wide.

With privacy glass switched on and the shades drawn, at night the Chanel building becomes one of the largest black-and-white video walls in the world. The fashion merchant takes full advantage of the opportunity, too, mixing commissioned artistic imagery with not-so-subtle promotions of the Chanel brand.

For Tanteri, the project suggests the use of integral façade lighting in more practical and elegant assemblies. "As times goes on, skins will diminish in size yet perform multiple functions," he explains. "Further miniaturization is possible with the tools we have, and light is a scaleless thing, so we will still get the same performance." **C.C. SULLIVAN**

### DETAILS

**PROJECT** | Chanel Ginza Façade

**DESIGN TEAM** | Peter Marino Architect, New York City (architect); Tanteri + Associates, New York City (façade/curtain wall lighting design); R.A. Heintges & Associates, New York City (curtain wall consultant); SGF Associates in partnership with LED Effects, Rancho Cordova, California (custom LEDs and controls); Eckelt Glass GmbH, Steyr, Austria (curtain wall glass panel supplier); Josef Gartner GmbH, Gundelfingen, Germany (curtain wall fabricator)

**PROJECT SIZE** | 1,701 square meters (LED portion only)

**WATTS** | 76.8 watts per square meter (LED full on/bright white)

**PHOTOGRAPHERS** | Takashi Orii (left and right); Vincent Kapp (center), courtesy Peter Marino Architect

**MANUFACTURER** | Nichia





## EXTERIOR HIGHLIGHTS

**LUCEPLAN | SKY | LUCEPLAN.COM**

This range of solar luminaires with IP65 ratings is available in four versions: with LED photovoltaic cells and rechargeable batteries, with high-efficiency LEDs with an electronic power supply, or with fluorescent or metal halide sources. The housing is fabricated from die cast aluminum, the diffuser is a polycarbonate material, and the lid is methacrylate. Available in three finishes: painted white, alu, or chestnut, the luminaire is also available in two heights—9- and 27-inches tall (approximately). **CIRCLE 125**

**MARTIN ARCHITECTURAL | EXTERIOR 1200 WASH | MARTIN-ARCHITECTURAL.COM**

This powerful 1200W projector, with its full range color mixing system is appropriate for illumination of tall structures, high-rises, or high-visibility architecture. For use with a metal halide lamp, the luminaire's optical performance allows uniform distribution of light and color. The fixture has an IP65 weatherproof rating, intensity control from 0-100%, and varying beam angles. **CIRCLE 128**

**GARDCO | 95 LINE | GARDCOLIGHTING.COM**

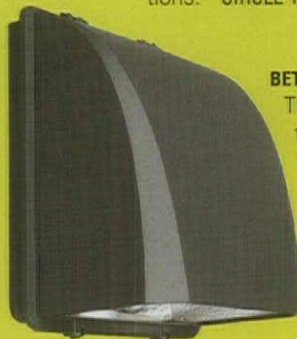
This series of steplights is designed specifically for use with LEDs. Available in either round- or square-housing styles, the fixture measures 5 inches square/diameter. A permanent power pack includes a single, 1W or 3W LED attached to a dual-voltage power supply. Five finishes including custom paint selections are available. **CIRCLE 126**

**U.S. ARCHITECTURAL LIGHTING | TRILUX | USALTG.COM**

The Trilux line is based on a modular design that allows a wide variety of fixtures to be configured from three basic body styles (Trilux arm shown). With field-adjustable aiming, the luminaire family is applicable for both commercial and residential installations. The fixtures can accommodate MR16 to 175W PAR38 metal halide lamps. Silicone O-rings provide waterproofing for outdoor applications. **CIRCLE 129**

**FC LIGHTING | LUNAR SERIES | FCLIGHTING.COM**

This new line of die-cast architectural floodlights uses LED lamping—Luxeon K2s to be exact. According to the manufacturer, the Lunar floodlight has an operating life of up to 50,000 hours. The fixture is also available in RGB configurations incorporating Color Kinetics' Chromacore technology, when color changing capabilities are needed. **CIRCLE 127**

**BETA LIGHTING | AVIATOR WALL PACK | BETA-LIGHTING.COM**

This large full cutoff wall pack is the latest addition to the Aviator Series. It meets IES full cutoff classification and meets anti-glare ordinances. The 16-inch housing accommodates metal halide, pulse start metal halide, or high pressure sodium lamp options through 400W. The fixture also has an IP65 rating. **CIRCLE 130**



# Toward a Sustainable Lighting Profession

BY MARK LOEFFLER

## LIGHT IS A STRATEGIC ENVIRONMENTAL RESOURCE

**LIGHT IS ENERGY. THAT MAKES LIGHT A STRATEGIC ENVIRONMENTAL RESOURCE.** While lighting professionals see themselves as primarily visual environment advisers, they are increasingly acting as energy investment advisers who help architects and owners understand the energy, environmental, and cost implications of their lighting decisions. The expectation for lighting to just make buildings “look good” is giving way to a new expectation for lighting to make buildings work better. And the new definition of “good” buildings encompasses sustainability.

Good and sustainable design is simply thoughtful, collaborative, and environmentally responsible design. The objective is a delightful and durable structure that will be productively utilized for decades, if not centuries. Good buildings need good lighting, which naturally means energy and resource efficiency as well as visual appeal. The green building approach values resource conservation, but it is really about optimizing performance. It also signifies an owner’s commitment to environmental responsibility, an attitude that is rapidly becoming mainstream and the construction norm.

It is cliché to note that the building design and construction industry is greening irreflexibly. However, some industries are leading, while others are only now reacting to the explosive interest and investment in green building. The real challenge for the lighting design and manufacturing industry is to become market drivers and not market followers. It is not surprising that the success of both the green building industry and the lighting design profession have followed a similar and steady upward trajectory in terms of market influence and successful practitioners. Lighting professionals thrive as collaborative advisers and problem-solvers, and the profession can leverage that influence as advocates for sustainability, opening new markets for our goods and services.

Lighting is a complicated—perhaps over complicated—industry in which lighting insiders define “quality” as the interplay of aesthetics, architectural integrity, visual acuity, and technology. But environmental advocates and consumers outside the lighting profession are actually driving the hot-button lighting issues of the day, such as: converting screw-based



The Yale Chemistry Research Building integrated daylighting and electric lighting systems to optimize lighting quality and energy efficiency (above). The second level lounge is indirectly lighted to supplement the available daylight (below).







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The conference room uses dimmable fluorescent ambient and halogen accent lighting on programmable controls (above).

lamps from incandescent to compact fluorescent to save energy and indirectly reduce power plant emissions; eliminating mercury in lamps; preventing light pollution and light trespass by restricting skyward outdoor lighting; meeting increasingly stringent energy codes; and achieving Leadership in Energy and Environmental Design (LEED) credits.

Lighting can seem like an arcane and frustratingly complicated industry. The delicate procurement chain of designer-to-agent-to-manufacturer-to-distributor-to-contractor-to-owner makes it difficult to ensure that a lighting system that is finely integrated and optimized with the architectural and mechanical systems will survive intact from design to installation. But the growing market for energy and environmental design creates an opportunity to reframe the appreciation of light as an essential component of good and responsible buildings.

So the lighting profession and industry is at an interesting junction. Either we run the risk of marginalizing ourselves from the real concerns of our constituents, or we can become energy and environmental advisers, expert in the benefits of good lighting. Our own sustainability as a profession will lie in our ability to define, articulate, and deliver quality design that meets the needs of the visual environment, while at the same time preserving the natural environment.

### REDEFINING THE VALUE OF LIGHT

Light is an essential element of the built environment. So the question is, how can we as a pro-

fession extend the perception of green design and technology to include our goods and services? How can we reframe the perception of quality lighting design and equipment so that we are the real market drivers for low-energy, environmentally preferable visual environments? How does the lighting portion of a project become "value-added" not "value-engineered"?

A sustainable lighting future is not all that far out of reach. Here is a vision of what it could entail: → Lighting designers understand and embrace the architectural, engineering, and construction realities of project cost, schedule, and codes. Although these realities may sometimes constrain our design options, we cooperatively work within these limitations or we provide expert leadership to improve these codes.

→ Architects and lighting designers understand and integrate daylighting into their basic design approach. Daylight may be "free" energy, but only if it is properly controlled. This includes evaluating its illuminance potential, glare control, and thermal impact, since the first obligation of a sustainable building is to have a well-performing envelope.

→ Architects understand the basics of lighting design, so they understand how to value and use our professional lighting services and products. They appreciate lighting specification integrity as much as architectural design and finish material integrity.

→ Engineers actively promote integrated mechanical and electrical system design and modeling techniques to ensure that all systems are properly sized and applied.





The north-facing laboratories have generous daylight supplemented by T5HO fluorescent pendants to meet Yale's requirement for an average of 75 footcandles on the lab benches (above).

→ Lighting manufacturers compete for our business with streamlined procurement, production, and delivery methods to take the mystery out of lighting system acquisition.

→ Owners happily invest in adequate design, engineering, and modeling time to support integrated "right-sized" buildings and systems.

→ Construction managers are part of the collaborative design process and resist their "value engineering" impulses. When costs exceed budgets, then they provide line-item estimates for luminaires, controls, and installation costs so that the design team can make informed decisions about how to edit the design while maintaining its integrity.

Utopian as this list may seem, the green building movement is overhauling how we all go about the business of design and construction. As the lighting industry becomes stronger and more coherent with regard to sustainable design, it will create opportunities for research, product development, and new practice methods. This will increase the urgency for our professional associations and organizations to correspond with energy and environmental organizations that drive the building codes and standards process.

Gratifyingly, this is already happening through various committees, task forces, and individuals working diligently with state, national, and international energy code organizations, the International Dark-Sky Association, and the United States Green Building Council (USGBC) to improve the understanding of lighting quality and value. We may not always agree with the

rules (lighting designers are rule-averse by nature), but we can influence them.

In the same way lighting manufacturers go through waves of business consolidations and partnerships, we will see emerging, green-minded lighting designers follow new career paths working directly with architectural, engineering, and environmental consulting firms. We will also have to acknowledge the situation common outside the U.S.—very good designers working for manufacturers and sales agencies. If quality lighting design and technology become recognized as a green attribute, our entire industry will become even more economically viable and perceived as "value-added" not just a commodity or decoration.

#### PRACTICING LIGHTING FOR THE GREEN MARKET

The sustainable, collaborative approach to lighting design can succeed for all players in the lighting profession and industry. The best way to explain this success is with a project study.

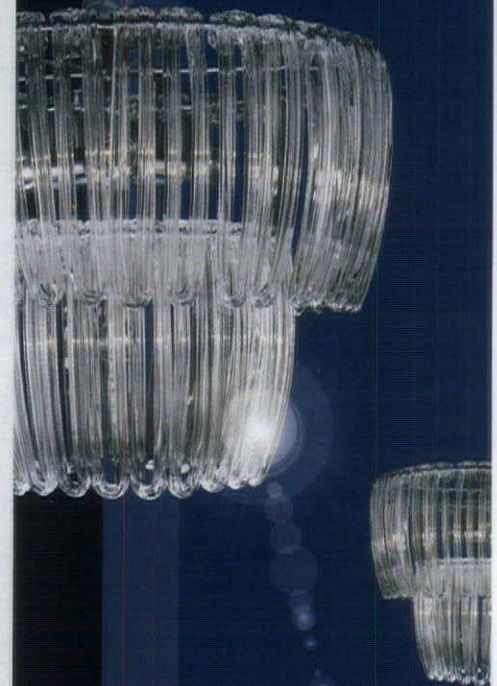
In 2003, I started a project with Cannon Design's Boston office and design architect Bohlin Cywinski Jackson's Pittsburgh office to design the lighting for Yale University's new Class of 1954 Chemistry Research Building. Simultaneously, my team and I worked directly with Yale University Planning to guide this project through the LEED for New Construction process as Yale's first LEED-certified building. Yale and the design team had already determined that this needed to be a well-lighted and energy-efficient building not only to attract world-class faculty and

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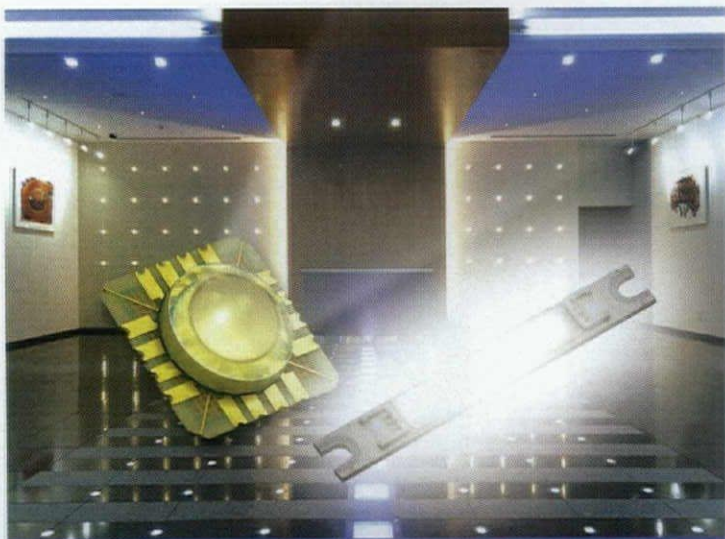
Dominici is a Brazilian brand with more than 50 years of tradition. Great for ambient lighting, the products are hand made in different sizes and heights. Pendants range from 17 to 43" diameter.



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## details | method

student researchers, but to help Yale manage its own co-generated energy costs and infrastructure.

Yale's commitment to sustainable design enabled the design and construction team to actively collaborate on integrated strategies while staying within budgetary constraints. The project began with a charrette in the schematic design phase in which we identified natural light and fresh air as design priorities. Virtually all design decisions could ultimately be traced back to those attributes, resulting in an energy-intensive high-tech building that achieved LEED-NC Silver and 20 percent energy savings better than code (along with 40 percent water savings, but that's another story).

The lighting design portion of the project started with analyzing the daylighting. Our studies established that north-facing laboratories would have to have a generous and stable amount of available daylight, even with semi-transparent shades pulled down. The analysis also helped us optimize the window size and height to preserve thermal performance while improving daylighting performance. We were able to design a system that minimally lighted the circulation zone near the windows and to concentrate our direct-indirect lighting system over the lab benches, adding task lighting in labs needing an extra boost for specific visual needs. South-facing offices with abundant sunlight received the same luminaire, located near the interior wall. Glass lights in doors and sidelights allow daylight from labs and offices to visually connect corridors to the outdoors, but the electric lighting is a carefully organized system of linear wallwashers aligned with bulletin board panels. We advocated daylight dimming, but that was declined due to concerns for added complexity, especially since every space was occupancy sensed. The entire system came in at a fairly low connected load of about 1.1 watts per square foot and at a cost of about \$6.00 per square foot (plus wiring and installation).

We selected luminaires based on performance and appearance, as well as our research into the manufacturers' commitment to supporting professional lighting design and to their environmental management. That meant starting with Lighting Industry Resource Council (LIRC) member companies with environmental policies. We also considered where the luminaires were made, even seeking products from within 500 miles of the building, even though LEED does not currently include electrical equipment in its credit that encourages procurement from nearby vendors to reduce transportation energy use.

By testing the proposed lighting system in a full-scale mockup of an entire laboratory, corridor, and office bay, Yale enabled us to issue a well-defined lighting specification, modeled on the *IALD Guidelines for Specification Integrity*. We worked closely with several different sales agencies and the construction manager to ensure that everyone understood our design requirements and the need to work cooperatively. This avoided time-consuming and needless value-engineering and substitution requests. So Yale got what it wanted: a high-performance lighting system for a high-performance building. And the design team got the satisfaction of a system completed to specification and industry recognition in the form of a 2007 northeast regional IESNA International Illumination Design Award for energy and environmental design.

Many designers practice this way. Their relationships with clients, architects, engineers, manufacturers, and construction managers help them leverage good design into quality lighting systems. At the risk of seeming naïve, this cooperative and collaborative approach may be the specific key to a sustainable future and the lighting profession's necessary evolution in response to the changing dynamics of design practice.

*Mark Loeffler, IALD, LC, LEED is the associate director of Atelier Ten's lighting design practice. He has more than 20 years' experience with integrated daylighting and electric lighting design for high-performance buildings. A visiting lecturer in daylighting and sustainable design for Parsons The New School for Design, he also holds an MFA in architectural lighting design from Parsons. He is a current member of the A|L Editorial Advisory Board.*





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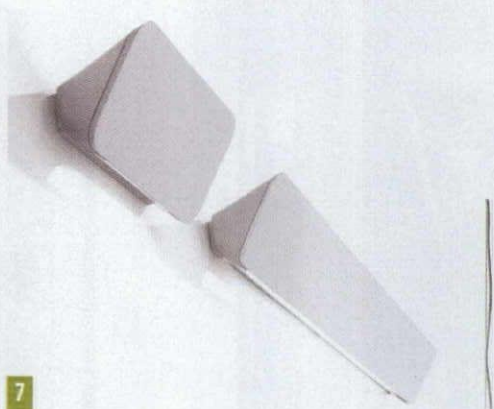
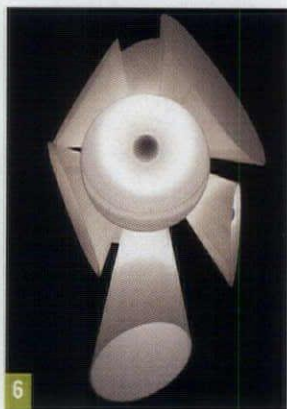
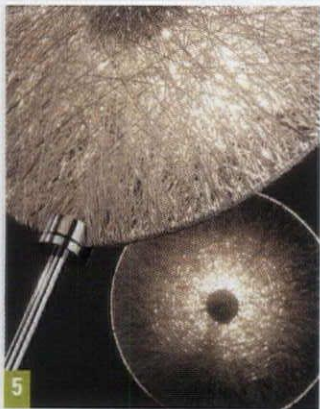
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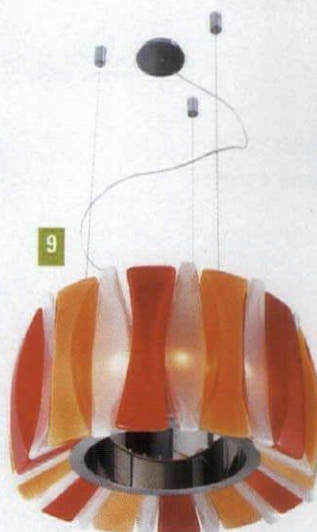
A SEASON OF NEW PRODUCT OFFERINGS IS AS DIVERSE AS THE TRADESHOW VENUES THEMSELVES.



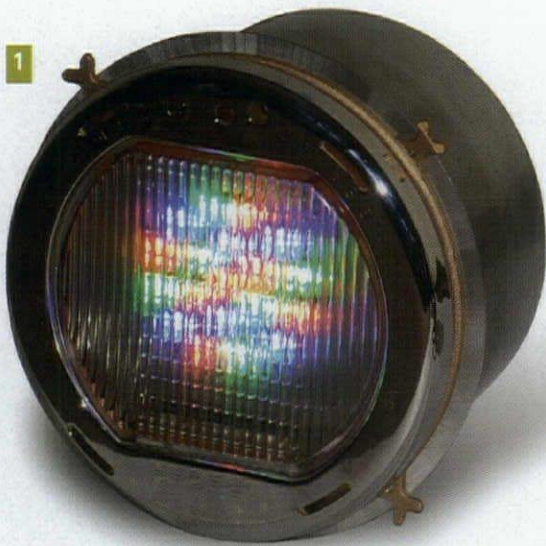
## EUROLUCE 2007

TEXTURE, COLOR, PATTERNS, AND BOLD FORMS WERE THE THEMES THAT FOUND THEIR WAY INTO THE LUMINAIRE OFFERINGS IN MILAN THIS SPRING.

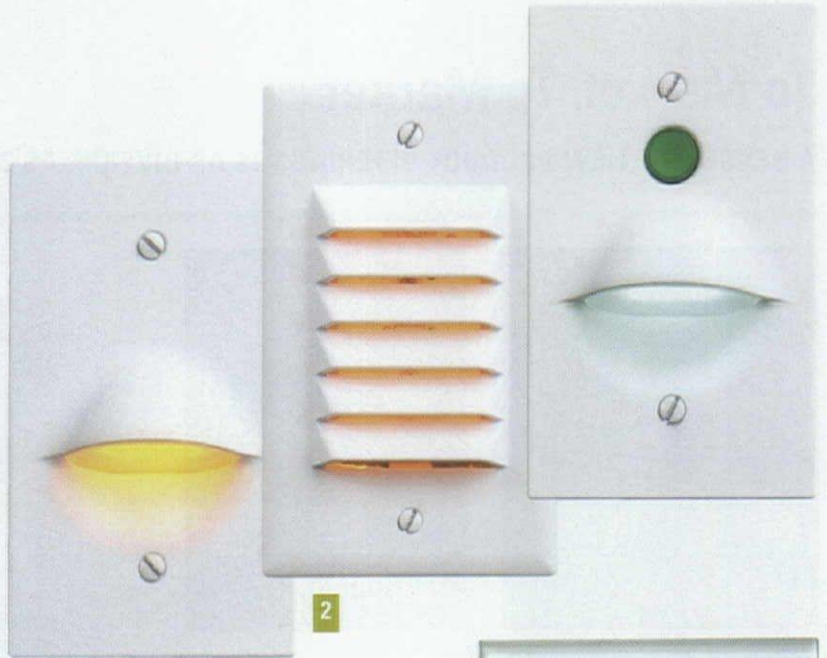
- 1 Barovier & Toso | MARYLAND CHANDELIER | barovier.com
- 2 Foscarini | SEE YOU | foscarini.com
- 3 Kartell | TOOBE | kartell.it
- 4 FontanaArte | TERRA | fontanaarte.it
- 5 &Costa | COCO | info@ecosta.it
- 6 Flos | NEBULA | flos.net
- 7 LucePlan | LANE | luceplan.com
- 8 Elementi | E02 | elementi.luceplan.com
- 9 Studio Italia Design | BELLISSIMA | studioitaliadesign.com
- 10 Flos | SKYGARDEN | flos.net
- 11 FontanaArte | POLARIS | fontanaarte.it



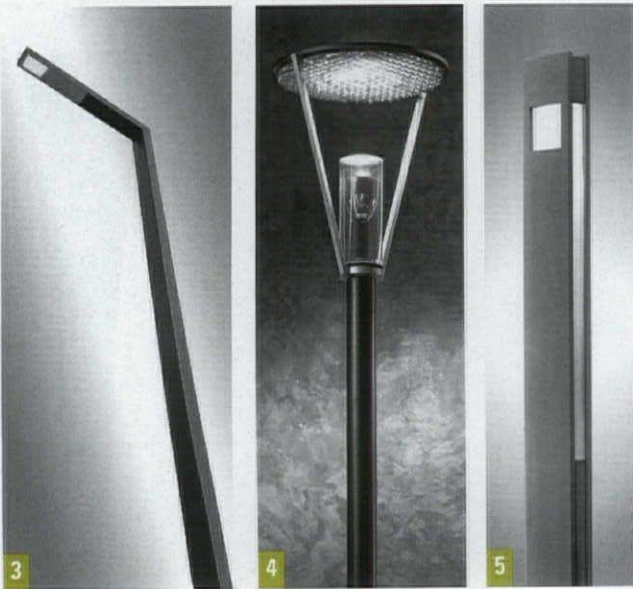




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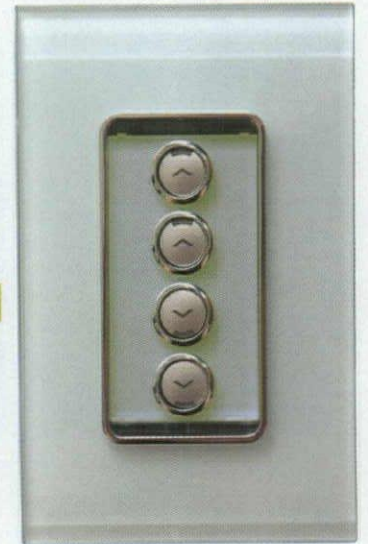
4

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6

7



## LIGHTFAIR 2007

LAMPS, BALLASTS AND CONTROLS, AND A HEALTHY DOSE OF SOPHISTICATED OUTDOOR LUMINAIRES DOMINATED THE PRODUCT OFFERINGS IN NEW YORK.

- 1 Hydrel | LED SWIMMING POOL AND FOUNTAIN FIXTURE | hydrel.com
- 2 Cooper | CIRCADIAN LED SERIES | cooperlighting.com
- 3 Hess | LINEA | hess.eu
- 4 Hess | MILANO | hess.eu
- 5 Hess | RENO | hess.eu
- 6 WattStopper | RT SERIES TIME SWITCHES | wattstopper.com
- 7 Square D | SATURN KEYPAD | squarelightingcontrol.com
- 8 Philips | MASTER COLOR ELITE | philips.com
- 9 Philips | ALTO II T8 LAMPS | philips.com
- 10 Osram Sylvania | ELOGIC | sylvania.com
- 11 Universal | BALLASTAR T8 | universalballast.com



8



9

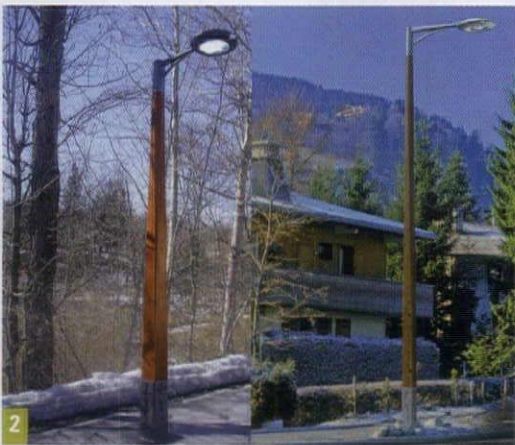
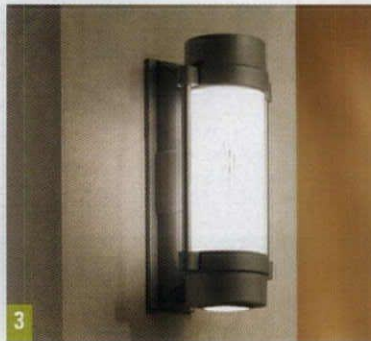
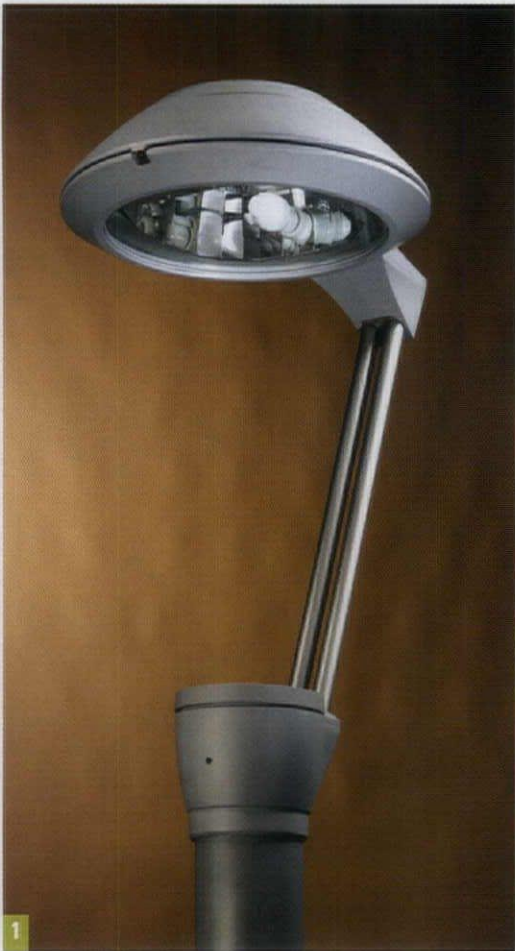


10



11





## AIA 2007

OUTDOOR LUMINAIRES ALSO HAD A STRONG SHOWING IN THE LIMITED LIGHTING PRESENTATION IN SAN ANTONIO.

- 1 Architectural Area Lighting | DIRETTO | aal.net
- 2 Selux | EVOLIS AND SONNE WOOD POLES | selux.com/usa
- 3 Architectural Area Lighting | VENERE SERIES | aal.net
- 4 Selux | DISCERA LED | selux.com/usa

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[www.epl.com](http://www.epl.com),  
<http://www.epl.com/>  
 keyword SPREDLITE, for spec sheets.

CIRCLE 300

hanley ▲ wood

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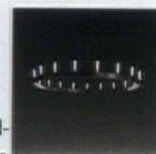


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CIRCLE 309

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# Vote For The Top 10 Companies!

Go to [www.ALaceawards.com](http://www.ALaceawards.com) or fax your ballot pages to 202.736.3470



## How The Program Works

1. Take a few minutes to review the list of manufacturers.
2. Circle the 10 manufacturers that meet or exceed the standards indicated in the voting criteria.
3. Of the companies you've selected, indicate your choices for Most Innovative, Most Respected, and Most Specified.
4. Go to [www.ALaceawards.com](http://www.ALaceawards.com) or fax your ballot pages to 202.736.3470.

## Voting Criteria

Select the manufacturers who have provided you and your projects with:

- Exceptional Durability
- Exceptional Customer Service
- Superior Product Value
- Advanced Designs

## Methodology

The ACE ballot manufacturers' list appears in the April/May and June issues of ARCHITECTURAL LIGHTING, each reaching the 25,000 nationwide circulation. In addition, e-mail campaigns are conducted to ensure the broadest base of response. Ballots are provided at the AIA, Lightfair and other industry conferences. A|L also conducts random sampling, consults with industry experts, and the list of nominated manufacturers is subject to review by an in-house publishing team.

## Results Will Be Announced In The November/December 2007 Issue.

**Your votes must be received by July 6, 2007.**

**>> Deadline: July 6, 2007**

3G Lighting	Bartco Lighting	Crestron	Eureka	Hemera, Inc.
3M Light Fiber	Beacon Products, Inc.	Custom Lighting Concepts	Eurofase, Inc.	Hessamerica
Aamsco Lighting	Bega Lighting	Cyclone Lighting, Inc.	ExceLine	High End
Acrilex	Beta-Calco	D'ac	Fabbian USA	Highlights
Advance	Beta Lighting	Daslight	FAD lighting	Holophane
Alanod Aluminum	Birchwood Lighting	Davis/Muller Lighting	FC Lighting	Hubbell
Alera Lighting	B-K Lighting	Day-Brite Lighting	Fiberstars	Hubbell Building Autom.
Alkco Lighting	Blauet	Delray Lighting	Fine Art Lamps	HUNT Dimming
A.L.P. Lighting	Boca Flasher	Delta Light USA	Finelite	Hunter Douglas Contract, Solar Control by Nysan
ALS-Architectural Lighting Systems	Bodine	Derek Marshall Lighting	FLOS	Hydrel
Altman Lighting	Boyd Lighting	Dernier & Hamlyn	Focal Point	Icon International
Ambiance Lighting Systems	Brass Light Gallery	Designplan Lighting, Inc.	Forecast	IEPC Corp.
American Fluorescent	Bruck Lighting Systems	Dialite	Forms & Surfaces	IL America Inc.
American Glass Light	C.W. Cole & Co.	Domenici	Foscarini	ILEX
Amerlux	Capri Omega Lighting	Donovan Lighting	Gamma 3 Luce	iLight Technologies
AnafoI International	CECOL	Dreamscape Lighting	Gardco Lighting	Illuminating Experiences
ANP Lighting	Charleston Gas Light	e:cur	GE Consumer & Industrial Lighting	Illumination Lighting
Architectural Area Lighting	Chloride Systems	Eclipse Lighting Inc.	Ginger	Induction Lighting
Architectural Landscape Lighting	Cole Lighting	Edison Price	GKP	Industry + Design Light
Ardee	Color Kinetics	Eiko Ltd.	Gotham Architectural Downlights	Indy Lighting
Arroyo Craftsman	Columbia Lighting	Electrix	Guth Lighting	Insight Lighting
Aurora Lighting	Conant Custom Brass, Inc.	Elec. Theatre Controls (ETC)	H.E. Williams	Intense Lighting
Artemide	Con.Daz Lighting	Eleek	HADCO	IO Lighting
AVR USA	Con-Tech Lighting	Elite Bohemia/Bar Del Int'l.	Halo	IP44
Axo Lighting	Contrast Lighting	Elliptipar	Hampstead Lighting	IRIS
B-Light	Cooper Lighting	Encelium Technologies	Hatch Transformers	Ivalo Lighting
Baldinger	Corelite	Engineered Lighting Products	Heatron	Jesco Lighting Group
	COTCO	ERCO Lighting USA, Inc.		JJI Lighting Group
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- |                             |                                  |                                  |                                |
|-----------------------------|----------------------------------|----------------------------------|--------------------------------|
| Juno Lighting               | Lumec                            | Peerless                         | Serralunga                     |
| Kenall                      | Lumiere                          | Pennsylvania Globe               | Sharper Lighting               |
| Kichler                     | Luminis                          | Phillips Lighting                | Sill                           |
| KIM Lighting                | Luraline Products Co.            | Phillips Advance Transf.         | Sirius Lighting                |
| Kingbright                  | Lutrex                           | Phoenix Products Co.             | Sistemalux                     |
| Kramer Lighting             | Lutron                           | Phoster Lighting                 | Sirmos                         |
| Kurt Versen                 | Luxo Corporation                 | Planlicht                        | Solara Lighting                |
| Lam Lighting                | Luxo Italiana                    | Precision Architectural Lighting | Solatube International, Inc.   |
| Lamina Ceramics             | Lyric Lighting (Seagull)         | Prescolite                       | Space Lighting                 |
| LBL                         | Manning Lighting                 | Primelite                        | Spark Lighting                 |
| Ledalite                    | Mark Architectural Lighting      | Prisma Architectural Lighting    | Special FX Lighting, Inc.      |
| LEDtronics Inc.             | Martin Architectural             | Progress Lighting                | Specialty Lighting Ind.        |
| Legion Lighting             | McGraw Edison                    | Prudential lighting              | Spero Lighting                 |
| Leola                       | MechoShade Systems, Inc.         | Pure Lighting                    | SPI Lighting                   |
| Leucos USA                  | Mercury                          | Q-Tran Inc.                      | Spring City Elec. Manuf. Co.   |
| Leviton                     | Metalumen                        | Quality Lighting                 | Square D Clipsal               |
| LexaLite International      | Metalux                          | Reggiani Lighting USA            | Starfield                      |
| Light Craft Manufacturing   | Meyda Lighting                   | Renaissance Lighting             | Starfire Lighting              |
| Lightech                    | Mills Architectural Lighting     | Renova Lighting Systems, Inc.    | Steng Light                    |
| Lighting by Bushfeld        | Morlite Systems                  | Rockscapes                       | Sternberg                      |
| Lighting Services Inc.      | Mule Lighting                    | Rosco Laboratories, Inc.         | Stingray Lighting              |
| LightLight                  | Neoray                           | Rotaliani                        | Studio Due s.r.l               |
| Lightolier                  | Nessen                           | RSA                              | Studio Italia Design USA       |
| Lightolier Controls         | New Metal Crafts                 | Schmitz                          | Supervision (NEXXUS Lighting)  |
| Light-Project International | Nicolaudie                       | Schneider Electric               | Sure-lites                     |
| Linear Lighting             | Nora Lighting                    | Schonbek Worldwide Light         | Tambient                       |
| Litecontrol                 | NouVIR Research                  | Schnott-Fostec LLC               | Targetti North America, inc.   |
| Itemakers                   | Nutech Lighting                  | Schott North America             | Tech Lighting, LLC             |
| Lithonia Lighting           | Oggetti Luce                     | Schreder                         | Teka Illumination, Inc.        |
| Lithonia Controls           | O Luce                           | Se'lux U.S.                      | Terzani                        |
| Liton                       | Orbit North America              | Sea Gull Lighting                | THHC Lighting                  |
| Louis Poulsen Lighting      | OCL - The Original Cast Lighting | Selecon                          | Times Square Lighting          |
| Luceplan USA, Inc.          | Osram Sylvania                   | Semper Fi Power Supply           | Tivoli, LLC                    |
| Lucien Gau                  | Pathway Lighting                 | Sentry Electric Corporation      | Translite Sonoma               |
| Lucifer Lighting            | PCI                              | Serien                           | Traxon USA                     |
| Lumca                       |                                  |                                  | Trend Lighting Co., Inc.       |
|                             |                                  |                                  | Tridonic, Inc.                 |
|                             |                                  |                                  | Trilux Lighting Limited        |
|                             |                                  |                                  | Troy-CSL Lighting              |
|                             |                                  |                                  | Unilight Ltd.                  |
|                             |                                  |                                  | Universal Lighting Tech.       |
|                             |                                  |                                  | Ushio America                  |
|                             |                                  |                                  | Valmont Industries, Inc.       |
|                             |                                  |                                  | Vantage                        |
|                             |                                  |                                  | Varon Lighting                 |
|                             |                                  |                                  | Venture Lighting               |
|                             |                                  |                                  | Viabizzuno                     |
|                             |                                  |                                  | Visa Lighting                  |
|                             |                                  |                                  | Visio Lighting                 |
|                             |                                  |                                  | Vistawall                      |
|                             |                                  |                                  | Vossloh Schwabe                |
|                             |                                  |                                  | W.A.C Lighting                 |
|                             |                                  |                                  | W2                             |
|                             |                                  |                                  | Wagner                         |
|                             |                                  |                                  | Waldmann                       |
|                             |                                  |                                  | The Watt Stopper               |
|                             |                                  |                                  | Weaver & Ducre                 |
|                             |                                  |                                  | WE-EF Lighting USA             |
|                             |                                  |                                  | Wilshire Manufacturing Company |
|                             |                                  |                                  | Winona                         |
|                             |                                  |                                  | Xilver BV                      |
|                             |                                  |                                  | Zaneen Lighting                |
|                             |                                  |                                  | Zoltan                         |
|                             |                                  |                                  | Zumtobel                       |

Of the companies you have selected, which in your opinion is the:

Most INNOVATIVE

Most RESPECTED

Most SPECIFIED

I would also like to nominate these manufacturers (not listed) for the ACE.

Your Name

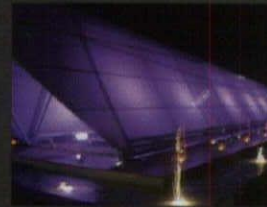
Title

Company

City/State



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## What will be the fate of the incandescent lamp? - Part Two

The April/May Industry Exchange question addressed one of the more interesting and contentious debates to face the lighting industry in recent memory—What will be the fate of the incandescent lamp? Lighting designer and IALD president-elect Jeff Miller offered his thoughts on the subject in the April/May issue. The discussion continues this month with three additional perspectives. Architectural Lighting magazine welcomes all comments on current and past Industry Exchange questions. Responses can be submitted directly to [exchange@archlighting.com](mailto:exchange@archlighting.com) or [edonoff@hanleywood.com](mailto:edonoff@hanleywood.com).

**MICHAEL GEHRING, PRINCIPAL |**

**KAPLAN, GEHRING, MCCARROLL ARCHITECTURAL LIGHTING**

Much has been written about the potential ban of incandescent lamps, and their replacement with compact fluorescents. Very important points have been discussed about fluorescent dimming costs, low-end range, and cooler color. Also, if compact fluorescent lamps are made in third world countries and shipped to the U.S., how much has the carbon footprint really been reduced? Once they burn out, will users really take them to hazardous waste facilities for disposal, or simply toss them in the garbage?

I'm going to take the political angle. Is Big Brother trying to micro-manage our lives? I can't think of such a minor item in peoples lives that the government has decided to ban. Evidently, A-lamps are worse for us than legal things such as cigarettes, cheeseburgers, alcohol, gambling, or handguns.

Compact fluorescent lamps are more prudent than incandescent lamps in many scenarios, but their use should be encouraged, not mandated. As more fluorescent lamps are made and sold, their cost of purchase and dimming will decrease. And as the cost of energy continues to rise, the payback period will shorten. Market forces will do to the A-lamp what they did to the VCR, 8-track tape, and the typewriter.

Government currently uses taxation to prompt their desired behavior. Mortgage deductions, low-income housing tax credits, and charitable deductions are examples of this concept. What if incandescent lamps were taxed like cigarettes or gasoline, with the proceeds used to develop solar, wind, and geothermal power? Are A-lamps really worse for us than handguns?

**SCOTT YU, PRINCIPAL, CHIEF CREATIVE OFFICER | VODE LIGHTING**

Recognition of the choices we make and its impact in the reduction of our carbon footprint is both refreshing and hopeful. Recent proposed legislation to reduce energy consumption in California and at local levels are laudable actions taken by a ground swell of concerned citizens and politicians to make a difference. This is the right direction to take.

To make an impact, we need to look at both the energy generation side and the consumption side. It is sensible to look for things that can make a difference in a relatively painless fashion. However, banning a specific type of lamp in the name of reducing energy consumption can be problematic and create unintended consequences. Banning incandescent lamps will create a huge opportunity for illicit importation of this type of lamp from neighboring states, or countries if the law is not universally applied to all states.

The right approach should be a performance-based benchmark, essentially a technological neutral approach by setting a minimum standard lumen per watt requirement for all light sources. This will set a target for manufacturers to improve the energy efficiency of existing technology, such as incandescent and quartz halogen lamps, and compete on equal footing. While the energy consumption of compact fluorescent lamps is significantly lower, however, nobody is addressing seriously the issue of recycling, and the mercury contamination problem in landfills. Again, not targeting a specific light source, but set a standard for low toxicity in waste stream. Government should not pick winners or losers in lamp technologies, but set standards for minimum efficiency requirements and maximum toxicity allowances, and heavily tax those that do not meet the requirements.

**What will be the fate of the incandescent lamp?**

*With so many recent proclamations to "Ban the Bulb," politicians and manufacturers seem to have made a cut and dry case against incandescent sources. But is there a legitimate complaint? Are compact fluorescent lamps the solution, as this "Ban" would advocate? Or is it a far more complex issue with numerous factors that go well beyond the simple incandescent lamp itself, which has served us for the last 125 years?*

**LARRY FRENCH, PRINCIPAL | AUERBACH GLASOW**

The incandescent lamp has been with us and served us well for so many years that we have perhaps forgotten just how useful and low cost a source it really is. Although compact fluorescent retrofit lamps are a good substitute in many cases (I use them extensively in my own home) they are not the universal panacea that some individuals would make them out to be. For example, disposal of these retrofit lamps poses a real problem, and if you break one in your home the State of California suggests rather draconian methods of clean up. I, for one, would welcome some legitimate studies that look at "cradle-to-grave" costs, energy use and environmental impact of compact fluorescent lamps starting with the mining/refining of rare earth phosphors and mercury through the manufacturing process and all the way through their life to the disposal of these sources in hazardous waste facilities. Will the compact fluorescent lamp still prove to be more "green" than the incandescent lamp? We really don't know.

California Bill AB 722, was introduced in the California State Legislature on February 22, 2007. The bill states: "On and after January 1, 2012, a general service incandescent lamp shall not be sold in the state." The law defines this lamp as a "standard incandescent or halogen type lamp that is intended for general service applications and has all of the following: (a) a medium screw base, (b) a wattage rating no less than 25W and no greater than 150W, (c), a A-15, A-19, A-21, A-23, A-25, PS-25, PS-30, BT-14.5, BT-15, CP-19, TB-19, CA-22 or equivalent shape as defined in the American National Standard Institute C78.20-2003, (d) a bulb finish of frosted, clear or soft white type.

I offer that trying to implement such a ban will most likely promote a thriving black market as homeowners reject the ban flat out. We have already experienced the phenomenon of new home builders in the State installing the Title 24 mandated "high efficiency" luminaries—until the inspector has visited—then ripping them out to install the incandescent fixtures they actually want. The education of the consumer has not caught up to the fact that lighting done well can make these "high efficiency" systems very pleasant to be around. Regardless, there is still a place in responsible, well-executed design for the sources proposed to be banned.

I don't agree that pushing connected load allowances ever downward or banning the incandescent lamp are the answers to energy efficiency. One of the elements often not taken into account is energy use over time. An important consideration related to energy use is if the lighting is off or reduced when it isn't needed. Right now, there has been a general removal of encouragement/incentives to include sophisticated lighting controls in projects. Looking at alternate models for energy efficiency that consider kilowatt hours rather than connected load would seem to make a whole lot of sense.

In general, I think most people would agree that we live a large part of our lives in built environments illuminated by electric light. As such, the well-designed (or badly designed) illuminated environment affects every aspect of our lives, both physically and psychologically. What we don't want is to impose unhealthy, unpleasant or poorly productive illuminated spaces on the human environment. Forcing designed spaces into formulaic approaches with extremely limited solutions is not the answer. Beauty and joy can still be maintained while remaining responsible environmental citizens of the world. It is a balance and must be considered holistically.