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LIGHTING

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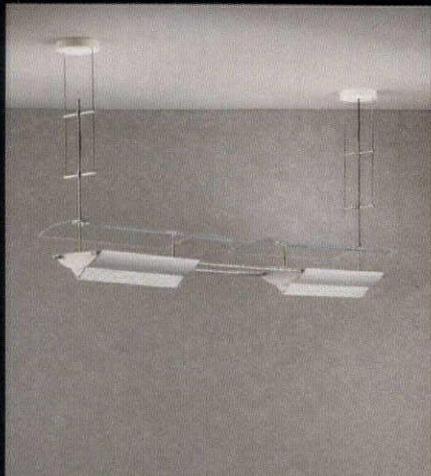
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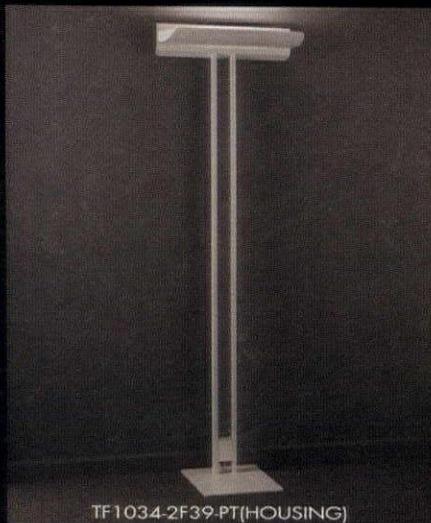
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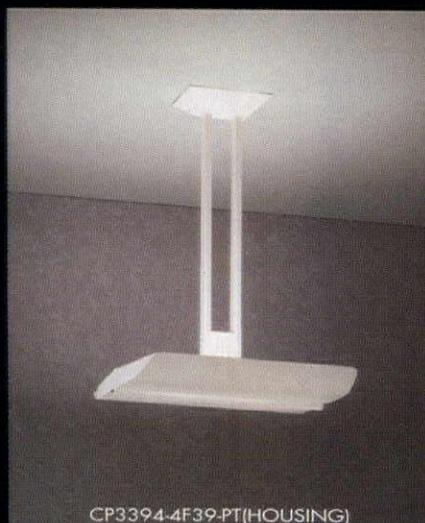
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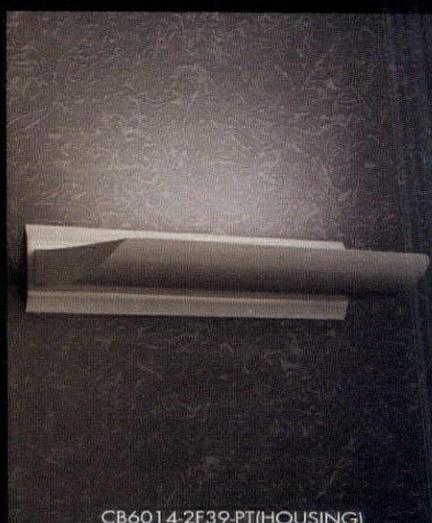
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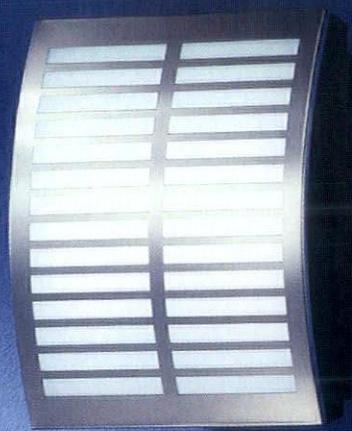
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ARCHITECTURAL LIGHTING (ISSN 0894-0436) is published quarterly by Miller Freeman Inc., a member of United Newspapers Group, 600 Harrison St., San Francisco, CA 94107. Phone (415) 905-2200. Editorial offices, One Penn Plaza, New York, NY 10119-1198. Phone (212) 714-1300. Subscriptions: U.S. and possessions—1 year (4 issues) \$24. Canadian—1 year \$30. Other foreign—1 year \$125. Single copy price: U.S.—\$6 plus postage; outside U.S.—\$8 plus postage. **Prepayment required for all single copy orders.** Address all single copy requests and customer service (subscription) questions to 1-800-255-2824, or write to ARCHITECTURAL LIGHTING, P.O. Box 1061, Skokie, IL 60076-8061. Allow 4-6 weeks for change of address: provide old mailing label and new address changes to ARCHITECTURAL LIGHTING, P.O. Box 7609, Skokie, IL 60076-8061. Second class postage paid at San Francisco, CA, and additional mailing offices. Copyright 1995 Miller Freeman Inc. All rights reserved.



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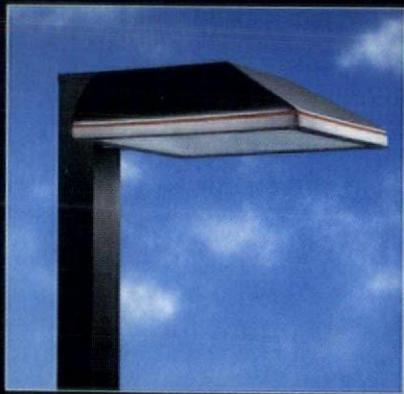
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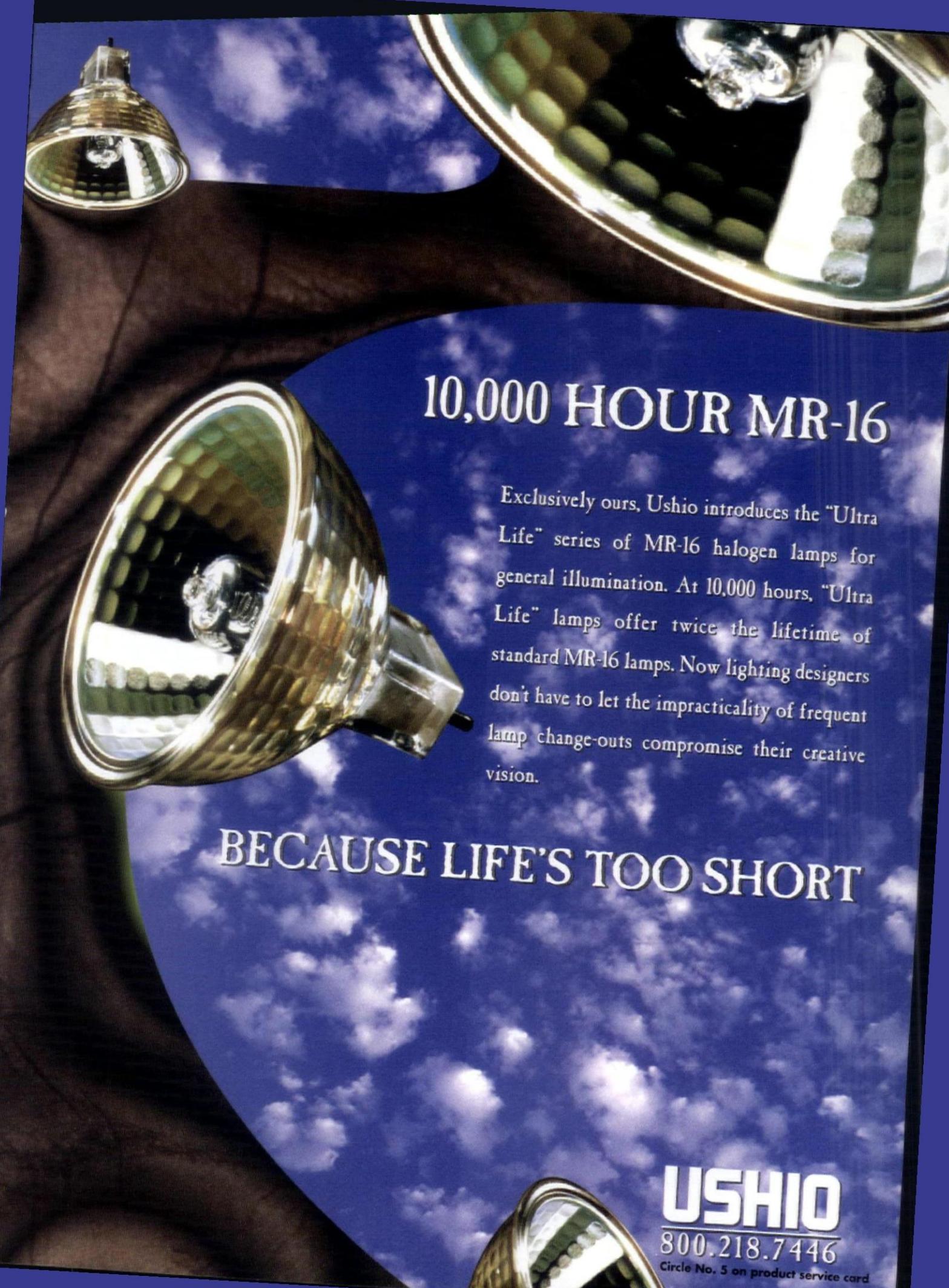
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WHEN WE LIGHT THE WAY FOR OTHERS

WE ARE TRULY ENLIGHTENED OURSELVES.

For years, Lighting Corporation of America companies have enjoyed shining success. With this privilege of success comes an equal responsibility to lighten the loads of people who are struggling around us. So, while we light the way to excellence in our industry through outstanding products, we commend the shining examples of humanity who permeate our companies. People like Mary Wong of Prescolite. As part of the California Rescue Dog Association, she and her dog Tellus have given more than one thousand volunteer hours to rescue training and actual searches for missing persons. She hopes that someday she can return a lost child, safe and sound, to the parents' waiting arms. Lighting Corporation of America. We cast a new light on life.



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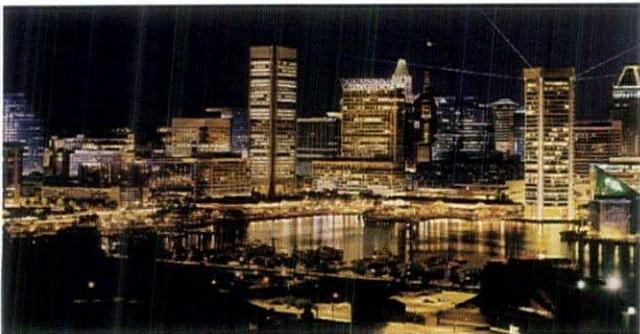
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UPDATES

CITIES OF LIGHT



Baltimore, located at the head of the Chesapeake Bay, lighted at night (top). A five-year plan currently underway expects to transform Baltimore into "the Paris of the Eastern United States," according to Mayor Kurt Schmoke. Individual building owners will decide how their buildings will best be lighted. The second illustration (bottom), prepared by Hanlon & Partners, an advertising firm, shows how Baltimore may look at the conclusion of the Brighten Baltimore plan.

Air travelers over the Northeastern Corridor may soon be saying, "On a clear night, you can see Baltimore." In preparation of the city's bicentennial in 1997, Baltimore will use lighting to transform its historically somber industrial image into a bright lightscape. The Brighten Baltimore plan—sponsored by Baltimore Gas and Electric (BGE), The Downtown Partnership of Baltimore, a civic advancement organization and the local chapter of the Building Owners and Managers Association—is comprised of a building facade lighting plan and a streetscape lighting plan produced by Grenald & Associates of Philadelphia.

In an era of shrinking civic budgets, several American cities are using lighting as a low-cost strategy to revitalize communities with enhanced safety, security, aesthetics and prominence.

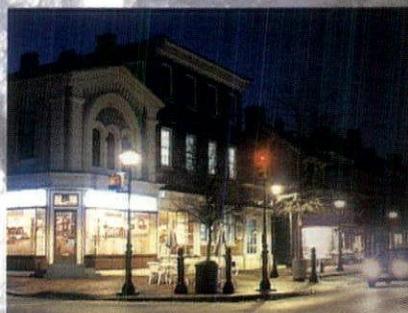
In Atlanta, for example, when business owners were asked to help make the city the "International City of Light"

Continued on page 11



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Driveway

to
Highway



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Play of Light.

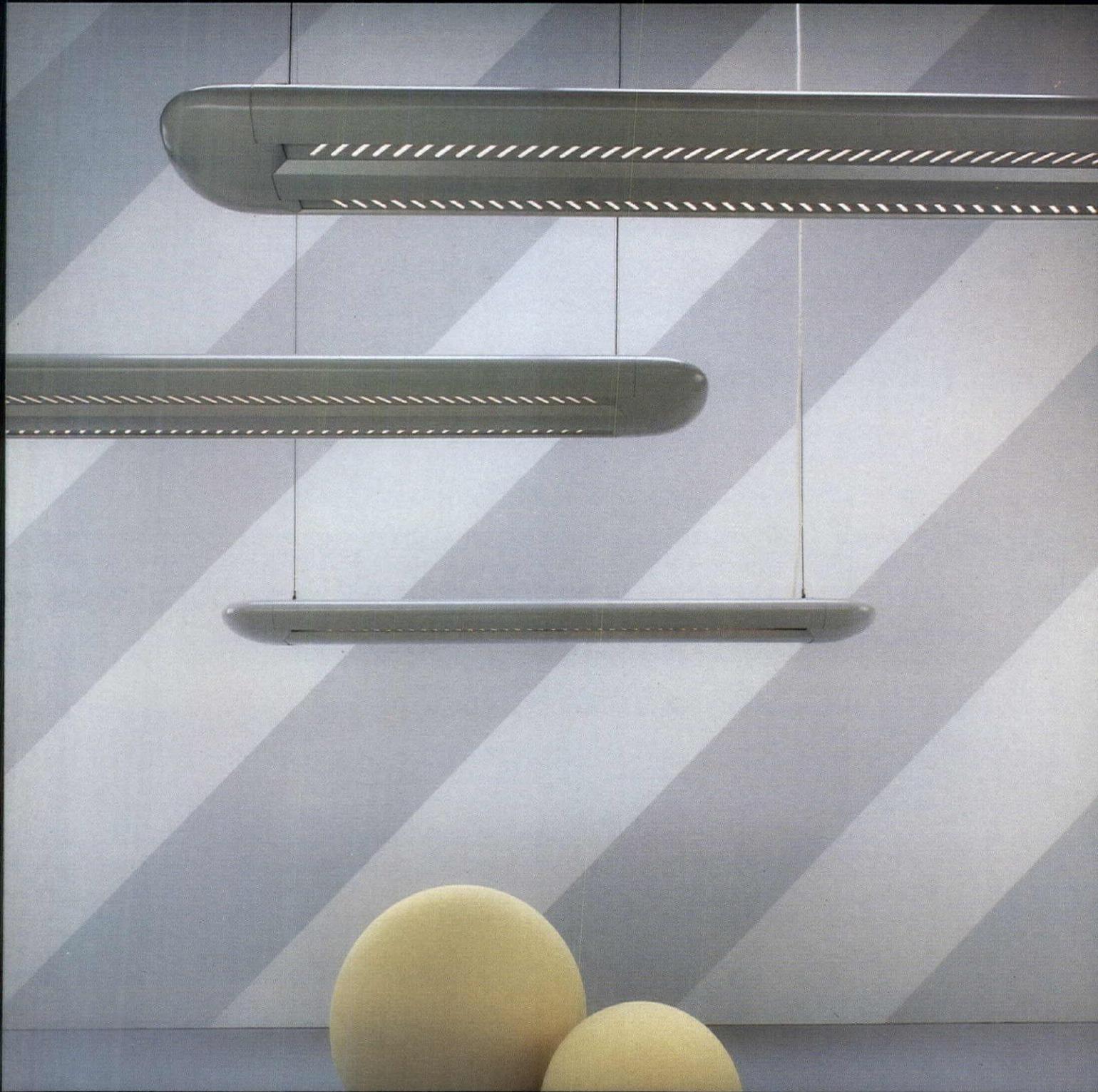
MORE THAN JUST LIGHT — ILLUMINATION.
LUCIFER LIGHTING PRESENTS ITS 1995
PRODUCT LINE-UP, COMPLETE WITH DRAMATIC
SPOTS AND SINUOUS TRACKS. THESE PROD-
UCTS CONTINUE LUCIFER'S TRADITION IN
FEATURING SMALL, HIGH INTENSITY LIGHT
SOURCES FOR ARCHITECTS AND DESIGNERS
WHERE HIGH ILLUMINATION IS REQUIRED IN
A SMALL CONFIGURATION. CLOCKWISE FROM
UPPER LEFT: ALTIMA COND SPOTLIGHT,
DL15X DOWNLIGHT WITH DEEP BAFFLE,
AND HELIX PENDANT LUMINAIRE.

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for the 1996 Centennial Olympic Games, Regent Partners, a real estate development and management firm, transformed Tower Place's 29-story glass office tower with a half-mile of emerald-green neon and its storefronts with a variety of colors. The project responded to the city's Master Lighting Plan that calls on installation of new exterior lighting at more than 80 buildings in Buckhead, Midtown and Downtown.

...In further news in Baltimore, BGE recently presented a \$1.1 million rebate check to the University of Maryland Medical System for installation of energy-efficient lighting and mechanical systems in the new 330,000-sq.-ft. Homer Gudelsky Building, an in-patient facility, and other facilities. The University of Maryland Medical System is expected to save \$460,000 each year in operating costs thanks to efficiency.

NUCKOLLS FUND GRANTS \$ 10,000 TO THE U. OF MINNESOTA

The Nuckolls Fund for Lighting Education, established in 1988 as an endowment to support college-level lighting education, has given its 1995 \$10,000 grant to the University of Minnesota to develop a multidisciplinary lighting design studio and for installation costs of equipment to support the hands-on nature of the studio experience. The course will bring together students and faculty from interior design, architecture and theater to solve lighting design problems interactively.

CSL SIGNS DEAL FOR ELECTRONIC BALLAST TECHNOLOGY

CSL Lighting Manufacturing, Inc. of Valencia, CA, a manufacturer of commercial and residential high-end light fixtures, signed an exclusive licensing agreement with C.R. Stevens and William Alling earlier this year. Under the agreement, CSL gained exclusive right to the unique patented electronic ballast technology developed by Stevens and Alling. CSL formed the Alta Illumination division to market energy-efficient lighting.

SK AMERICA LAUNCHES NEW DIVISION

SK America announced it has launched MaxLite, a new division that specializes in supply and service of energy-efficient lighting products which include electronic ballasts, T8 and T10 lamps, HID lamps, occupancy sensors, LED exit signs, compact fluorescent lamps and other products.

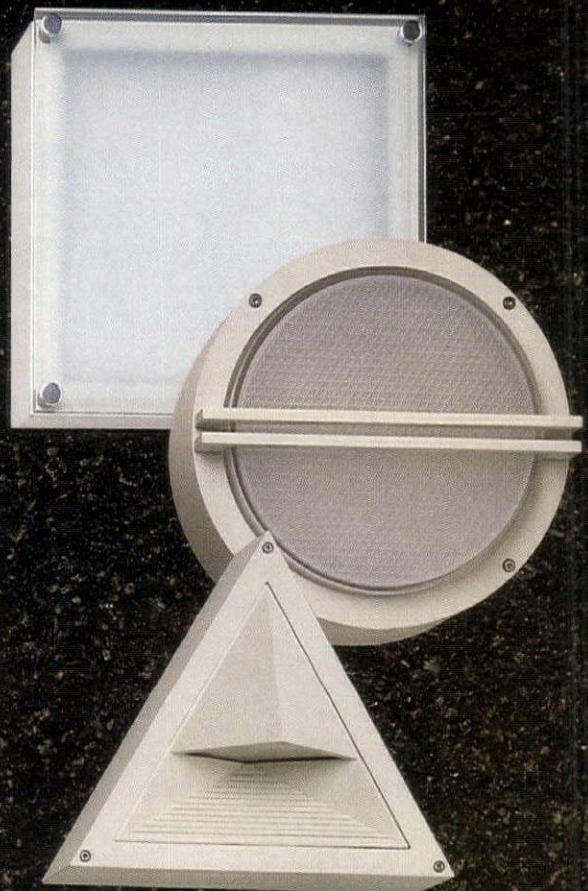
GE LIGHTING LAUNCHES NEW T8 CAPACITY

GE's Oakville, Ontario lighting plant recently launched a new \$40 million high-speed fluorescent lamp production line to manufacture GE Trimline T8 fluorescent lamps. The new capacity has been added to ensure that GE would continue to meet the growing demand for T8 lamps. Lamps produced at the 300-ft.-long production line are shipped to customers in the United States and Canada.

UL INTRODUCES ENERGY VERIFICATION

Underwriters Laboratories Inc. (UL) has introduced an Energy Verification Service (EVS) to help manufacturers of

Continued on page 13



We're now measuring our success in Metric.

Ludenscheid, Germany is a lot like Winsted, Minnesota. That's because Ludenscheid is home to Hoffmeister-Leuchten. And Winsted, to Sterner. And both companies make equally brilliant lighting solutions. So it's no wonder both companies are working together to introduce lighting like the Metric Series - stunning, contemporary fixtures with a variety of lamping options. They're what we'd call "different" here in Winsted. Which may be exactly what you're looking for, if you're looking for reliable, high-performance, UL-listed luminaires featuring true European design sensibilities. With Sterner and Hoffmeister, nothing is lost in the translation.



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STERNER LIGHTING SYSTEMS INCORPORATED

Winsted, Minnesota 55395
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HOFFMEISTER

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SENSORswitch

"PASSIVE DUAL TECHNOLOGY - NO KNOWN EQUAL"

The **Sensor Switch** occupancy sensors are superior to *ALL* other brands currently available. This advertisement and the ones to follow will provide the engineering proof to back this claim. You can either wait for our next ad or call us today for your own personalized demonstration, (203) 265-2842.

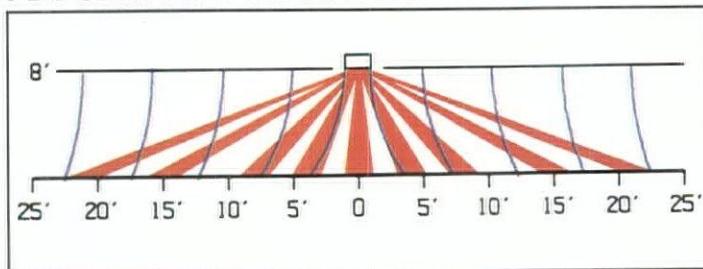
There are virtually hundreds of things that **Sensor Switch** does to make superior products; however, the following highlight the four paramount features that make the **Sensor Switch** products unparalleled:

- Factory Calibrated Sensitivity & Time Delay
- Relay Contact Circuit Protection
- **Unique Products for Specific Applications**
- Competitively Made in U.S.A.

The **Sensor Switch** Passive Dual Technology **PDT** Sensor offers the unique sensing combination of Passive Infrared (PIR) and Microphonics to literally *See & Hear* the occupants. Specifically designed for areas with obstructions, cubicle office space, large odd-shaped storage rooms, and restrooms with stalls; the **PDT** Sensor often replaces the need for multiple single technology sensors, or in some cases, the **PDT** product is the *ONLY* acceptable product to employ.

The **Sensor Switch** **PDT** Sensor mounts to the ceiling and views 20-25 feet in all directions. The PIR detector initially senses the occupants, then allows the Microphonic portion to activate. A unique back-up feature is provided for 15 seconds after the lights turn off whereby the Microphonic portion continues to listen. If needed, a simple "Hey" will reactivate the system. But, the most powerful feature in the **PDT** Sensor is the Automatic Gain Control (AGC). Unlike any other occupancy sensor, the **PDT** self adapts to its environment eliminating *tedious manual sensitivity adjustments!*

PDT SENSOR COVERAGE PATTERN



less than ultrasound. The **Sensor Switch** **PDT** Sensor is simply the only choice for areas with obstructions.

Please look for our next **Sensor Switch - No Known Equal** advertisement for more insightful details. Put us to the test and you'll join one of the fastest growing groups of satisfied users yet.



**Sensor Switch, Inc. 10 Capital Drive
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The Passive PIR/Microphonic Dual Technology Sensor replaces the need for Active Ultrasonic or Active Ultrasonic/PIR Dual Technology products. Installation is simplified by removing the sensitivity adjustments. False tripping is minimized through the reliable PIR. The AGC enhances performances when needed. *ALL* Passive Detectors means there are no emissions of Ultrasonic Sound Waves. And, the **PDT** actually costs

And the Story Continues...

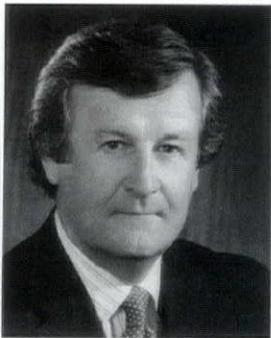
lighting products and other electrical equipment to meet the energy efficiency requirements of both U.S. and Canadian regulations, and demonstrate the energy efficiency ratings of their products to inspection authorities, utilities, distributors and other customers. Under the Energy Policy Act of 1992, a number of lighting products, including certain fluorescent and incandescent lamps, have been required to meet federal regulations for minimum energy ratings starting 1994. In February of 1995, Canada passed its Energy Efficiency Act that established efficiency standard for ballasts and other electrical equipment. According to UL, follow-up visits to verify energy efficiency can be conducted simultaneously with follow-up visits for product safety certification.

To help those parties interested in determining which products have been evaluated to U.S. and Canadian energy efficiency requirements, UL will publish a directory containing the names of manufacturers whose products meet regulations along with efficiency ratings. For more information regarding EVS, contact Lenore Berman at UL, (708) 272-8800 x42848.

EDISON PRICE RECEIVES COMMENDATION

Edison Price Lighting received a commendation for "outstanding performance" and a plaque from Port City Electric Company, the electrical contractor responsible for the new \$148 million 850,000-sq.-ft. Charlotte Convention Center in Charlotte, NC. Edison Price supplied metal halide, compact fluorescent and quartz fixtures. According to Edison Price, the company received the commendation primarily for responsive service during the project.

CLARK PROMOTED TO PRESIDENT, COO OF TKLP



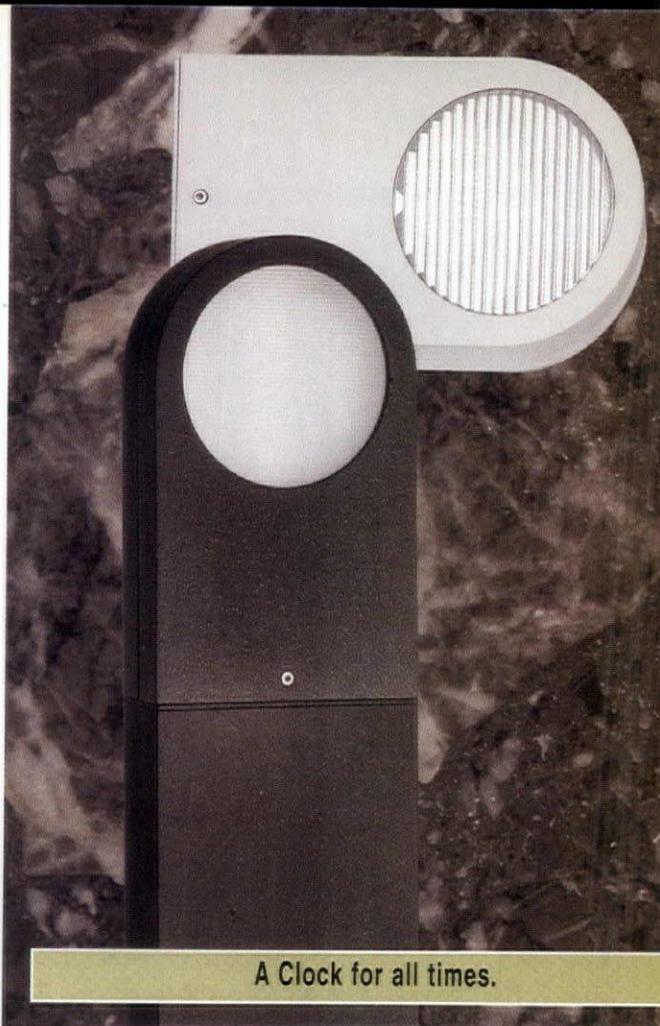
Carl T. Clark, AIA has been promoted to president and COO of The Kling-Lindquist Partnership, an architectural/engineering and interior design firm located in Philadelphia. Clark is responsible for all office operations; the architecture, engineering, design and marketing departments report to him. Clark said he will focus on design excellence and service to

differentiate TKLP in an increasingly competitive marketplace.

PLANTÉ JOINS CASELLA LIGHTING



Casella Lighting, a manufacturer of high-end commercial and residential wall lamps, table lamps, torchieres, sconces and other specialty lighting, has announced that René A. Planté has joined the company as national sales manager. His responsibilities will include sales through Casella Lighting's agents, representatives and designer showrooms, as well as contract sales nationwide.



A Clock for all times.

The speed of light is 186,000 miles per second. Which we don't doubt for a minute. Lighting, after all, can get dated in a hurry. But not our new Clock Luminaire from Hoffmeister. The Clock Series of Wall Mounts and Bollards is definitely ahead of its time - sleek, modern designs with a variety of lens options for dramatic lighting effects. There's even a 360° rotatable lens that let you direct light where it's needed without lamp glare. The Clock Series is UL-listed, too, and built to Sterner's rigid, high-performance standards. Which means you get a light fixture that easily passes the test of time.



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NEW LIGHTING INFO SERVICES DEBUT ON WORLD WIDE WEB

Iris Communications, Inc. recently unveiled inter.Light, a new Internet World Wide Web site dedicated exclusively to lighting products and lighting design, for lighting designers, architects, electrical engineers, contractors and facility managers. Services include directory listings of lighting companies, an e-mail product information request capability, searchable product databases, a "hot lighting products" photo gallery, EPACT light-

ing updates, lighting design case studies and links to other useful information on the Internet. Using the dial-up convenience of any Internet connection, inter.Light can be accessed through a World Wide Web browser at no additional charge.

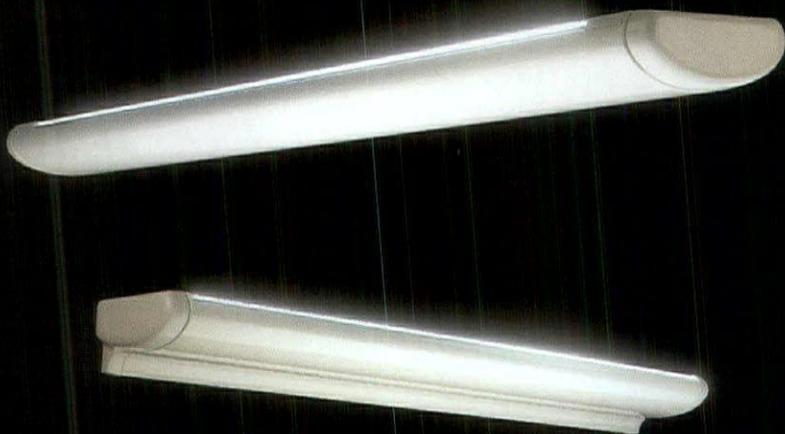
The address for inter.Light World Wide Web is <http://irisinc.com/inter.light/>.

In further Internet news, The Lighting Resource, a new weekly electronic service, has also been developed to provide information to lighting professionals and end-users on lighting technology, new products, a schedule of events, commentary and links to related sites.

The Lighting Resource's World Wide Web electronic address is <http://www.webcom.com/~lightsrc/>.

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LIGHTOLIER LAUNCHES TECHEXPRESS

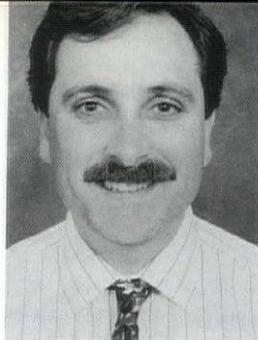
Lightolier, a Fall River, MA-based manufacturer of light fixtures for commercial and residential applications, has capitalized on the growing electronic information revolution by launching TechExpress, an around-the-clock service that provides access to technical information. TechExpress is a value-added service to lighting designers that includes a Fax-on-Demand system, an Electronic Bulletin Board service and a CD-ROM catalog prototype. A Windows version of GENESYS, a lighting calculation program, is expected to be released next year.

The Fax-on-Demand system provides access to specification and instruction sheets. Users dial (800) DIAL-LOL and identify correct document numbers, then wait for the requested materials to be faxed to them almost immediately.

The Electronic Bulletin Board system allows access to Lightolier's fixture calculation files (commonly known as IES files) via modem. Users can download recently released product test files to their computers.

The complete CD-ROM catalog, which will be available in December of this year, features Lightolier's color catalogs as well as dimensional diagrams of the company's product line. Users will be able to pull up items by identifying the type of product they require or the actual product number. Several different viewing methods will be available, including thumbnail sketches.

For more information, call Lightolier at (800) 223-0726 or (800) 217-7722.

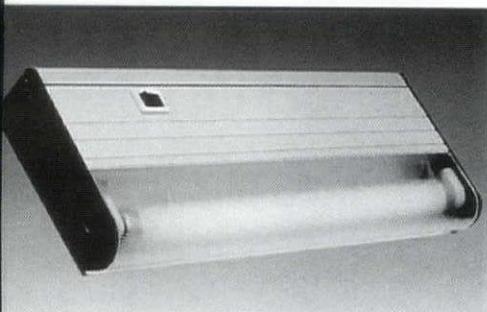


**IBBITSON
APPOINTED VP,
GENERAL MANAGER
OF ALL**

Architectural Landscape Lighting, Inc. (ALL), a manufacturer of outdoor architectural and landscape light fixtures for commercial and residential applications, has announced that Ian Robert Ibbitson has been named VP, general manager for this JJI Lighting Group, Inc. division. Ibbitson's goals include emphasis on engineering to solve landscape lighting problems and capitalizing on outdoor lighting's growing importance for decorative and security uses.

LEDALITE GAINS ISO 9001-94

Ledalite Architectural Products, Inc., a manufacturer of linear lighting based in Vancouver, British Columbia, Canada, has been officially registered by Inchcape Testing Services to the ISO 9001-94 quality assurance standard. The ISO 9000 series, developed by the International Organization for Standardization (ISO), provide international quality standards which have become increasingly important as the global market expands. An estimated 75,000 companies worldwide—8,700 in North America—are now registered to ISO 9000 quality assurance standards. Some 20,000 companies are certified to ISO 9001, with just over 3,000 registrations in North America.



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AWARD**

The Industrial Design Society of America and *Business Week Magazine*, co-sponsors of the 16th annual Industrial Design Excellence Awards (IDEA), recognized the Little Inch Connecting System (LINCS) under-cabinet lighting system for outstanding new lighting design among 766 total entries. Entries were judged on innovation, benefits, visual appeal and ecologically responsible use of materials and manufacturing processes. LINCS, a modular, plug-together energy-efficient under-cabinet/undercounter lighting system, is manufactured by Alkco, Ben Franklin Park, IL, a subsidiary of JJI Lighting Group, Inc.

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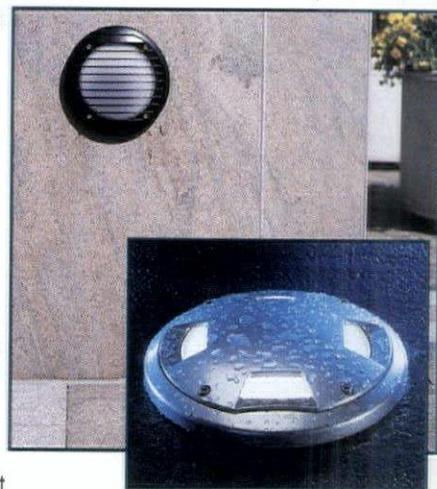
**BEST POWER SUPPLIES DUAL-LITE
WITH INVERTERS**

Dual-Lite announced that Best Power Technology, manufacturer of the Best-Lites line of AC inverter systems, will supply inverter systems to Dual-Lite, Emergency Lighting Division of Newtown, CT. According to James R. Carson, president of Dual-Lite, the new relationship is the result of the recent acquisition of Best Power Technology by General Signal Corporation, which also owns Dual-Lite under its GS Building Systems unit. The Best-Lites brand of emergency lighting AC inverter systems will now be marketed by Dual-Lite and sold under the Dual-Lite name.



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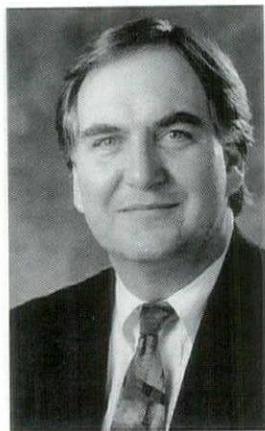
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USI LIGHTING, INC. ANNOUNCES NAME CHANGE

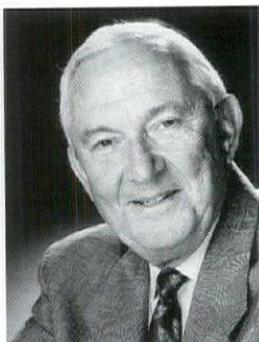
Columbia•Prescolite•Moldcast companies, commercial light fixture manufacturers, announced a name change from USI Lighting, Inc. to C•P•M Lighting, Inc. According to CEO J. Kiernan White, the name change was made to help focus on the three brand names. C•P•M Lighting, Inc. is owned by Lighting Corporation of America.



DUAL-LITE NAMES DIACHENKO PRODUCT DEVELOPMENT MANAGER

Dual-Lite, a manufacturer of emergency lighting systems and wiring products for the electrical construction industry, has named Richard L. Diachenko to the position of product development manager. He will be involved in the evaluation and expansion of markets through the introduction of new and enhanced emergency lighting equipment and wiring

products, as well as the development of new marketing opportunities for the existing line.



GERBER NAMED CEO/ COB OF CSL

Sy Gerber, formerly president of CSL Lighting Mfg., Inc., has been appointed CEO and chairman of the board, succeeding Jack Zukerman. A veteran of more than 39 years in the lighting industry, Gerber is known as a co-founder of Capri Lighting and a pioneer in the development and introduction of halogen low-voltage recessed and

track lighting applications. Gerber will focus on improvement and expansion of CSL's product line, research and development, customer service and delivery.



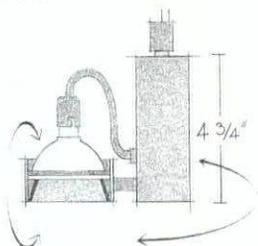
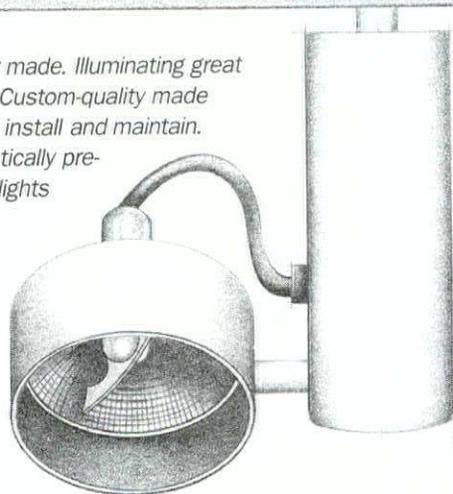
MELTZER APPOINTED VP, GENERAL MANAGER OF LAM

Warren G. Meltzer has been named VP, general manager for LAM Lighting Systems of Santa Ana, CA, a subsidiary of the JJI Lighting Group, Inc. that manufactures indirect light fixtures for commercial, industrial and institutional

applications. Meltzer, who brings 40 years of lighting industry experience, has been with LAM for eight years. Some of Meltzer's goals include combining aesthetics and energy efficiency in LAM's fixture lines.

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ENERGY-EFFICIENT LIGHTING: BOON OR BANE?

In many ways, energy-efficient lighting has changed the world designers work in. It may not have been very noticeable year to year, but over time the changes were dramatic—sort of like when a lighting professional friend of mine says, “Nothing new at Lightfair this year,” then marvels at the number of new technologies, products, applications, etc. in general, and says it’s hard to keep up . . . In the early ‘80s, there were fewer than 10 electronic ballast manufacturers, now there are more than 50 . . . The boom hit lamps too, energy management systems, controls—an industry responding to rising electric bills, Green Lights, new legislation, DSM and tougher energy codes with new products, improvements, approaches. Even the language we use is different. When

Jimmy Carter put on a sweater and turned down the White House thermostat on national TV, the buzzword was energy conservation. It sounded desperate, even demeaning. Today, energy-efficiency is the word—it implies you get more for less. It sounds empowering.

What about lighting designers? Demeaned or empowered?

For years, energy-efficient lighting projects were the domain of the “after-market” and ready distributors, contractors and ESCOs. But owners became more educated, codes and laws were put in place—and now lighting designers are up to their necks in it. Some designers saw energy efficiency as a problem to be solved, a restriction on expression, one more challenge to achieving the right aesthetic goals. After all, 80 percent of our impressions are visual, so the lighting can be as efficient as you’d like, but if it doesn’t produce the right environment or otherwise meet the client’s aesthetic goals, it’s a failure . . . Other designers saw the wave as a way to grow their business in a market slow in construction but booming in renovation. The fact is, today’s lighting designer is in the best position, and is the best professional available, to achieve the most appropriate lighted environment that operates at the lowest energy cost.

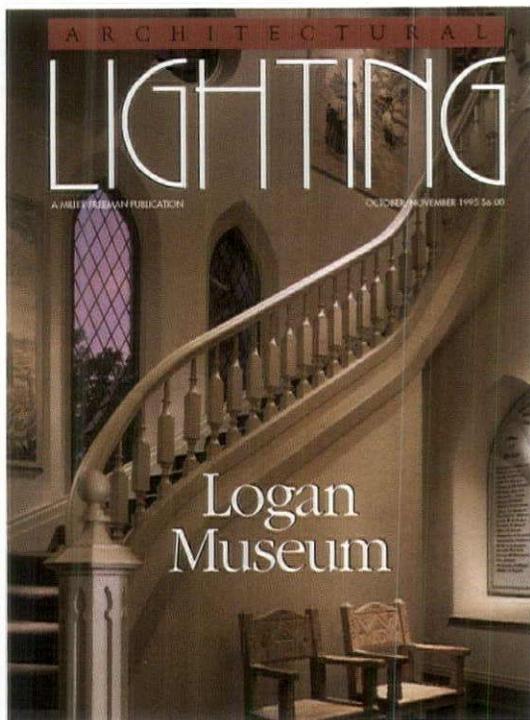
In either case, of course, education is the key to capitalizing on change.

That’s why in this *Architectural Lighting* we

deal with the central issue—“How can I, as a lighting design professional, maximize dual, sometimes conflicting, goals of aesthetics and efficiency?”

We hope you enjoy our survey of the state of energy-efficient lighting and the rest of our last issue of 1995—packed with projects, news, products, landscape lighting technique and a discourse on fiber optics.

Then get ready for 1996, and join us for our 10th anniversary, when we unveil an exciting future for *Architectural Lighting*.



CRAIG DILOUIE
EDITOR-IN-CHIEF

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STELLAR PERFORMANCE

BY CHRISTINA TRAUTHWEIN, MANAGING/DESIGN FEATURES EDITOR

CHALLENGE They say everything in Texas is big. Well, the American Multi Cinema (AMC) Grand movie theater is certainly no exception. In fact, this first-of-a-kind complex is the largest in the states, second in the world. And attention-grabbing, often colorful lighting plays a huge role in creating the dynamic and entertaining environment the client envisioned.

"AMC requested that the interior and exterior of the facility be exceptionally exciting—a visual experience that builds anticipation for patrons," said Glynn Brown, president of architectural and design firm, GB Design, Inc., Kansas City. So Brown chose an overall galactic theme for the theater. Now, people can come to see their favorite stars—and comets and planets—all under one roof.

The 15-acre complex is clearly visible from a high-traffic freeway; exterior lighting and signage must catch the focus of passersby and invite them into the mega structure. Once there, movie-goers begin their fantastic voyage right in the parking lot, and are then transported to the various theaters through an atmosphere of excitement. Added Brown, "We never let the people forget that they've come here to be entertained."

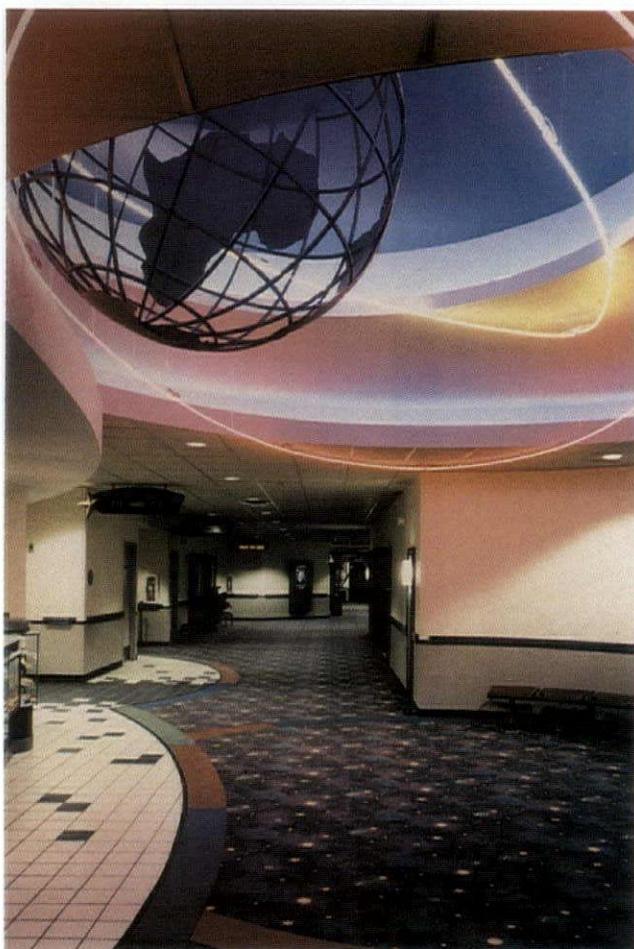
DESIGN/TECHNICAL CONSIDERATIONS While the surroundings had to be visually engaging, the design called for "controlled excitement"—that is, it was necessary that the whole space be clearly identified and integrated in order to channel such a large group of audiences comfortably and easily... a spectacular vision with focus.

"For instance," said Brown, "there are a lot of elements in a movie theater that should attract one's interest—concession stands, ticket counters, marquees, theater entrances." Therefore, while dramatic lighting is necessary to draw the crowds' focus to each area, each area must be distinct, and not be overwhelmed with too many conflicting images. "In other words, the goal is variety and excitement without competition," explained Brown.

METHOD "We used dramatic, specialty-type lighting, such as fiber optics and neon, to give the design some zip, and to convey an on-the-edge feeling and look," said Brown. Furthermore, the design team employed different levels of lighting to avoid a constant, static atmosphere. General illumination (recessed incandescent) is kept fairly dim so that the "fun" lighting elements, as well as the LED-lighted marquees, take center stage. "Crowds constantly move through different types, levels and colors of light, which heightens their excitement as they head towards concession stands and the auditoriums," said Brown.

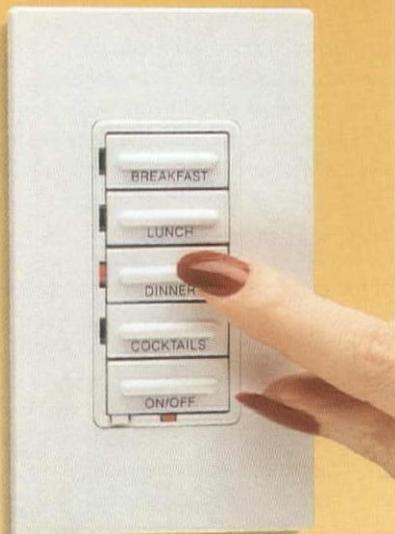
Upon arrival at the theater complex, people are led to a median strip, which directs them to the front entrance of the theater. There, 250W incandescent lamps in burial fixtures wash the exterior facade, giving character and shape to two architectural tow-

Continued on page 22



When movie-goers enter the parking lot for the AMC Grand, they are immediately drawn in by eye-popping neon lights (top). The attraction and excitement continues upon entering the lobby areas where twinkling fiber optics resemble a starlit sky (middle) and colorful neon rings encircle the globe (bottom).

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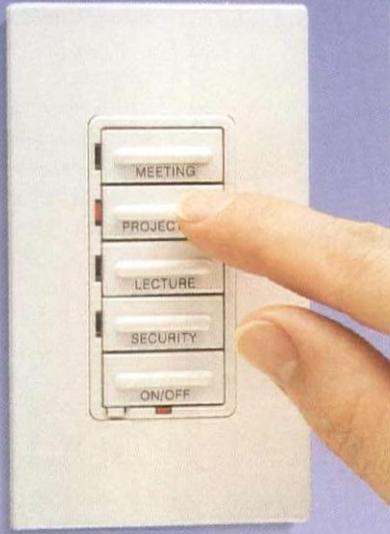
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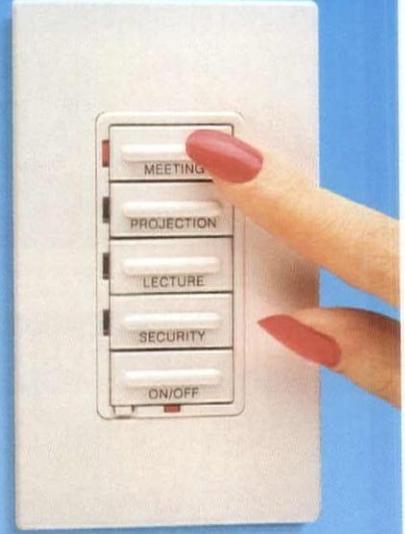
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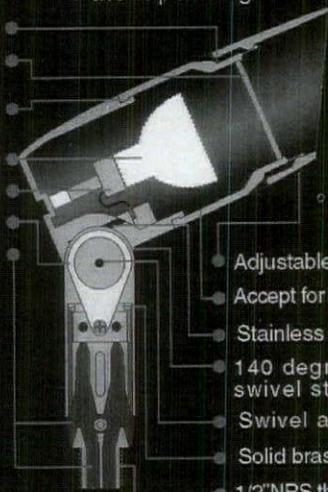
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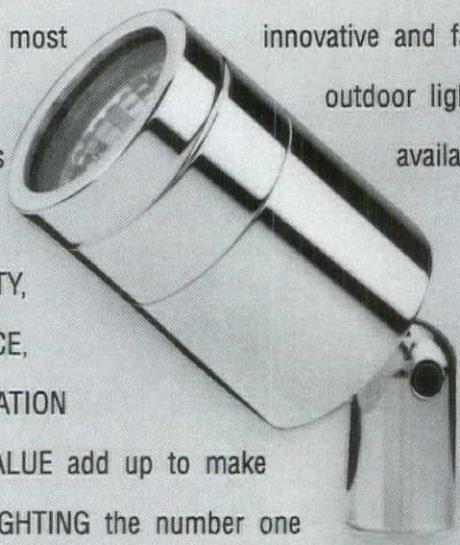
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Continued from page 20

ers that mark the front of the building. Placed across the front walk are 32-in.-high bollards with 70W metal halide lamps. These light the pathway to the entry and provide human scale to an otherwise massive structure.

The huge exterior marquee that signals the entrance has an art deco effect, evocative of Hollywood premiere nights. Fuchsia and yellow neon line the face of the building, and a large red AMC logo and the front canopy signage proclaiming "The Grand" are backlit by white neon. "By backlighting the letters with neon, we enabled the words to pop out in a multidimensional effect," explained Brown.

Carefully positioned windows allow people to see into the lobby where lighted holographic, cosmic-like sculptures, illuminated by 75W incandescent lamps in 2-ft. track fixtures, entice them to enter. Once inside, timed, pulsing fiber-optic strands penetrate the convex ceiling, leading theater-goers to the all-important concession area. The fiber optics rotate on a color wheel, changing from white to blue to fuchsia to create a sparkling surface, which resembles a starlit sky. "With the wide-open spaces of Texas, we were trying to mimic the feeling of being outside on the inside," said Brown.

Fiber-optic strands are also used above the main concession stand on the bulkhead, patterned in fanciful loops on either side of a 10-ft.-diameter wire-frame globe encircled by the AMC logo. Again, the colors slowly change, adding more magic to the space.

Bright fuchsia neon, placed between each of three layers of plexiglass adorns the tops of two floor-to-ceiling columns in the main lobby area, transforming them into beacons of light that beckon people to continue toward the food/beverage counter and theaters. Small uplight/downlight fixtures mounted on each side of the columns illuminate the columns themselves, revealing their splayed design.

"In the secondary or satellite concession area near the individual theaters we created a Saturn-like effect," noted Brown. The ceiling here is at different heights, created by circular "voids" at varying depths. A large, 6-ft.-diameter sphere shoots out from one of the round recesses in the ceiling and is encircled by neon rings, or "asteroid belts," suspended at various lengths from the ceiling. Glowing pink, yellow and lavender light blends on the ceiling's surface to create a sunset-like mix of hues.

CONCLUSION The cosmic, visually appealing and often diverse lighting design successfully directs groups of people to their destination, while heightening their sense of excitement and gearing them up for a night of fantasy.

DETAILS

PROJECT: AMC THE GRAND

LOCATION: DALLAS

OWNER: AMERICAN MULTI CINEMA, INC. (AMC)

INTERIOR DESIGN: GB DESIGN, INC.

EXTERIOR ARCHITECTURAL DESIGN: GB DESIGN, INC. & GOULD EVANS ASSOCIATES

ARCHITECT OF RECORD: GOULD EVANS ASSOCIATES

MECHANICAL/ELECTRICAL ENGINEERS: WEST DAVIDSON REYNOLDS INC.

STRUCTURAL ENGINEER: NORTON SCHMIDT

CIVIL ENGINEERS: KIMLEY HORN & ASSOCIATES INC.

PHOTOGRAPHER: ARCHITECTURAL FOTO GRAPHICS—PAUL S. KIVETT

LIGHTING MANUFACTURERS: CABLE LITE CORP.; FLOS; SHAPER LIGHTING; HALO; KIM LIGHTING; LUMASCAPE; SIGNS MFG.

Damage Control

FIBER-OPTIC LIGHTING ENHANCES AND PRESERVES ARTIFACTS AT A WISCONSIN COLLEGE MUSEUM

BY CHRISTINA TRAUTHWEIN, MANAGING/DESIGN FEATURES EDITOR

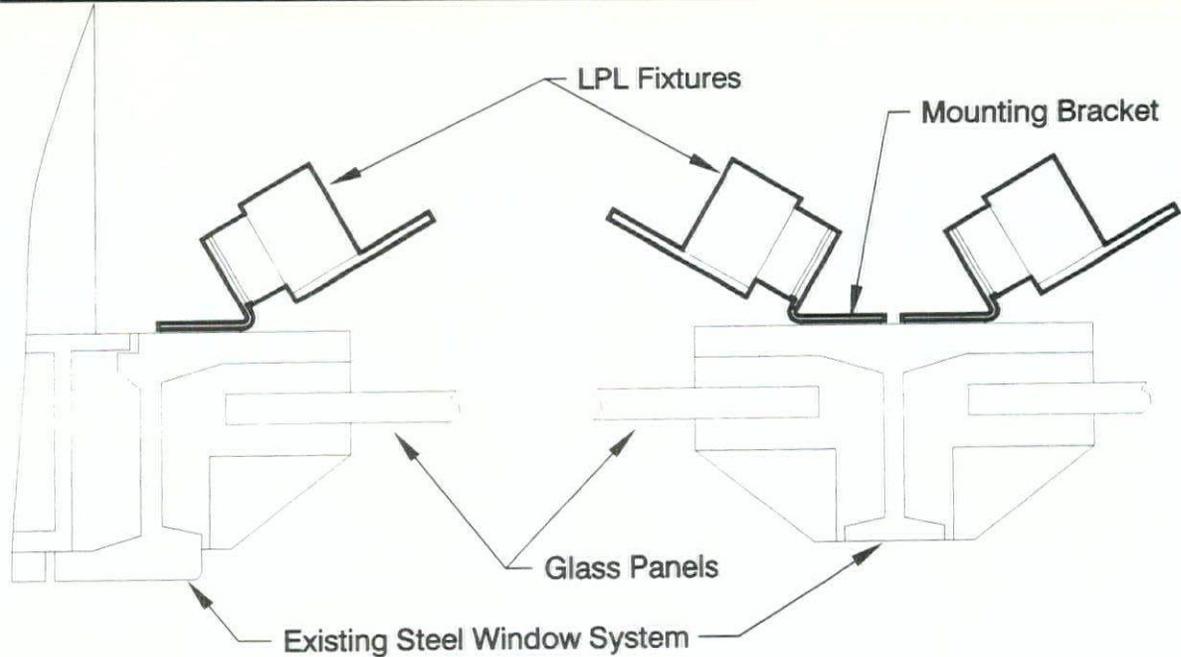
When designing the lighting for rare artifacts exhibits at the Logan Museum of Anthropology, Dagit•Saylor Architects left no stone unturned to develop a system that would showcase the vast array of priceless pieces, yet handle them with care. The firm created a plan that uses fiber optics, dual-track lighting and multi-zone controls as its core elements to achieve flexibility, versatility and dimmability.

Logan Museum, part of Beloit College's 126-year-old Memorial Hall, opened again this spring after undergoing a two-year, \$4 million renovation as part of the institution's Sesquicentennial Campaign. Founded in 1892, this academic and public museum houses a research and curatorial center for students, as well as internationally acclaimed anthropological collection of more than 225,000 pieces, including North American Indian and French Paleolithic artifacts and pre-Columbian ceramics.

For architect Peter M. Saylor, FAIA, the goal of the renovation was not only to display the museum's spectacular permanent collection, as requested by the College, but to create and maintain an environment that would preserve and protect it as well. Saylor designed a glass-enclosed, multi-tiered open storage system that enables visitors to view much of the impressive ethnographic and archaeological collection, as well as to observe professors and students performing hands-on work examining the collections. In addition to this central storage and

Lighting for the Logan Museum of Anthropology is designed to preserve and protect the museum's vast collection of artifacts. A sophisticated "floating" track system with UV filtering and dimming capabilities (left) accents individual objects outside the gallery's display cases.





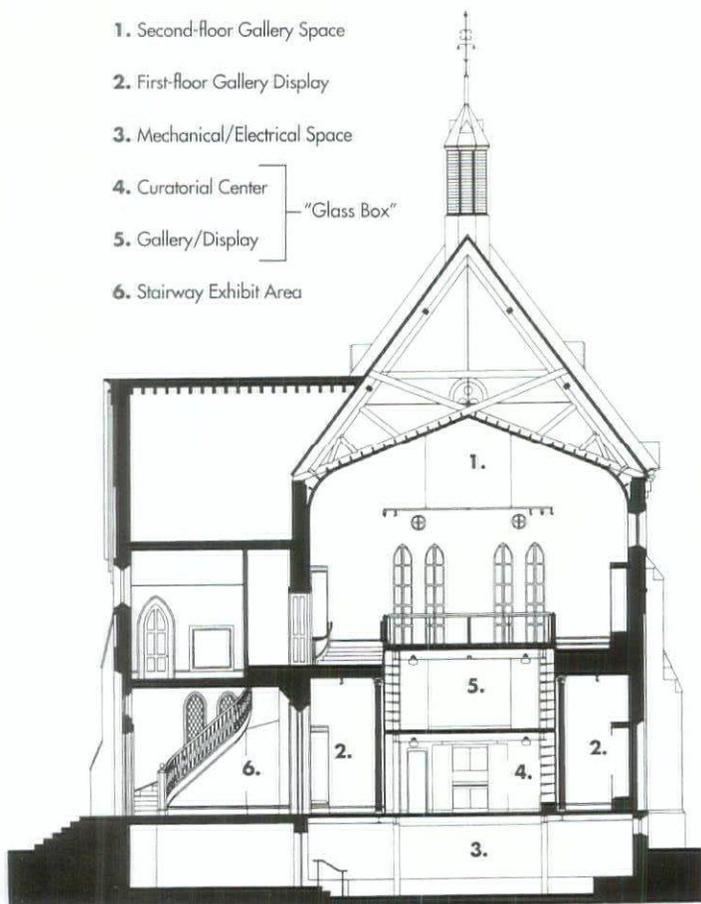
Cross Section Through Window Mullions, Logan Anthropology Museum - Beloit WI

research area, there is a main gallery on the second floor and several smaller gallery and display areas in the spaces surrounding the “glass box.”

The creation of an appropriate lighting design—one that would light research areas sufficiently but

minimally, illuminate display cases and most of all, not harm or disturb the fragile artifacts—presented a real challenge. Light levels at the displays must be low (5-10 fc) with even less illumination (1-2 fc) outside the display areas, and should be reasonably uniform to enable visitors to view the depth and enormity of the collection.

- 1. Second-floor Gallery Space
 - 2. First-floor Gallery Display
 - 3. Mechanical/Electrical Space
 - 4. Curatorial Center
 - 5. Gallery/Display
 - 6. Stairway Exhibit Area
- “Glass Box”

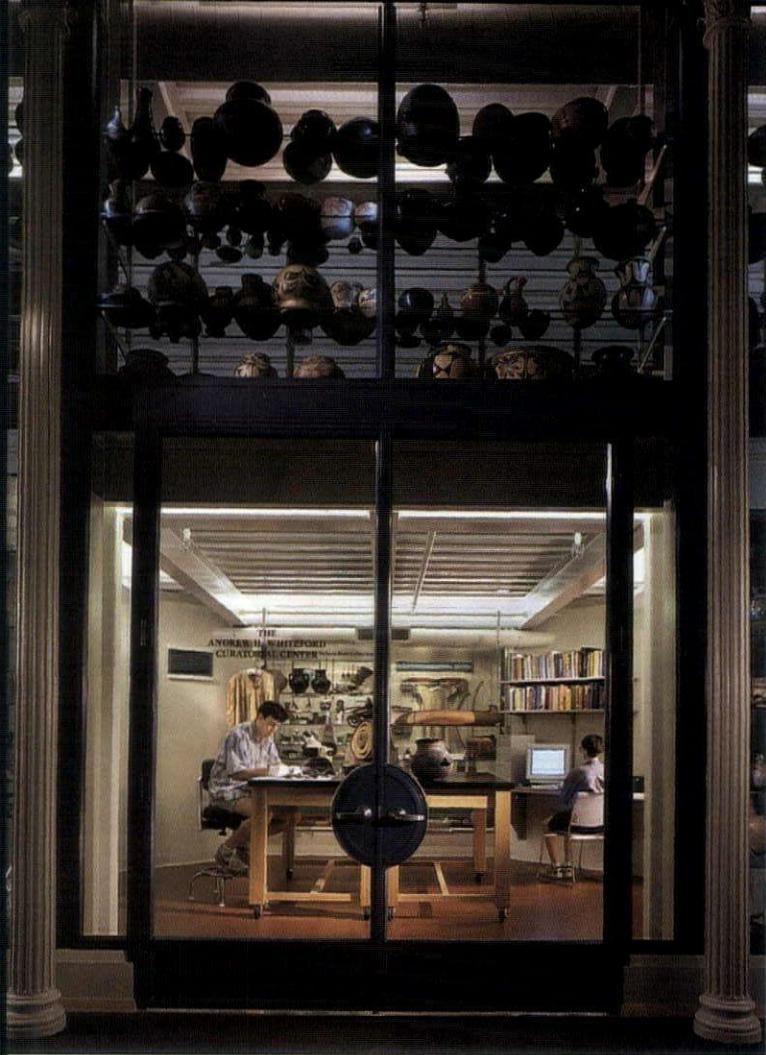


LOW-PROFILE DESIGN

For the centrally located, bi-level glass-enclosed storage area, Saylor chose fiber-optic lighting for its sensitivity to heat-sensitive objects and ease of maintenance. William Leaman and Jon West of Lightly Expressed Ltd. stepped in to create the system, which “gently” illuminates all of the pieces on view and seamlessly integrates with the architectural design.

The fiber optics team installed low-profile lighting (LPL) inside the display cases behind cast-iron mullions. Fibers are spaced 1 in. apart in the LPL channel. “With the limitation of illuminance to 5 fc, elimination of glare is critical,” said Leaman, president. “It was imperative that the fiber-optic light fixtures be located *inside* the box in order to prevent reflection on the glass front.”

As for the fiber-optic illuminators, they’re located at basement level in a maintenance space with the rest of the mechanicals, such as air handling and climate control systems, so that the lamps can be accessed and changed without going into the collection and having to disturb any of the objects on the shelves. “The whole purpose of a remote light source is to minimize any opportunity for damage to the collection that may occur during daily maintenance,” said Saylor. “The remote lamp location allows placement of the fixtures without imposing upon the architectural design the necessity to



The centrally located "glass box" storage and research area (above) is illuminated by fiber optics. Low-profile lighting (LPL) is installed inside the display cases behind cast-iron mullions (see diagram, opposite). This provides an even wash of light across the display shelves while eliminating glare on the glass front. The illuminators, which house metal halide lamps, are in a remote location. More than 25 miles of optical fiber make it the largest installation of LPL fiber-optic lighting in the country.

include access for relamping and maintenance."

A total of 30 illuminators are located on the ceiling of the basement, each one below a vertical mullion. From there, the fibers run up into the glass box and into tiny holes in the LPL fixtures, which are mounted on the back of the cabinet mullions in 13-ft. runs. According to Leaman, more than 25 miles of optical fiber was used on this project. "This is the largest installation of low-profile fiber-optic lighting in the country," he noted.

The fiber-optic system is illuminated by metal halide light sources with color temperature-reducing filters. "We selected metal halide for the life of the lamp, then modified its output to approximate the light output and coloration of the surrounding lighting, which is primarily quartz halogen," said Leaman. A variable aperture dimming system was designed for

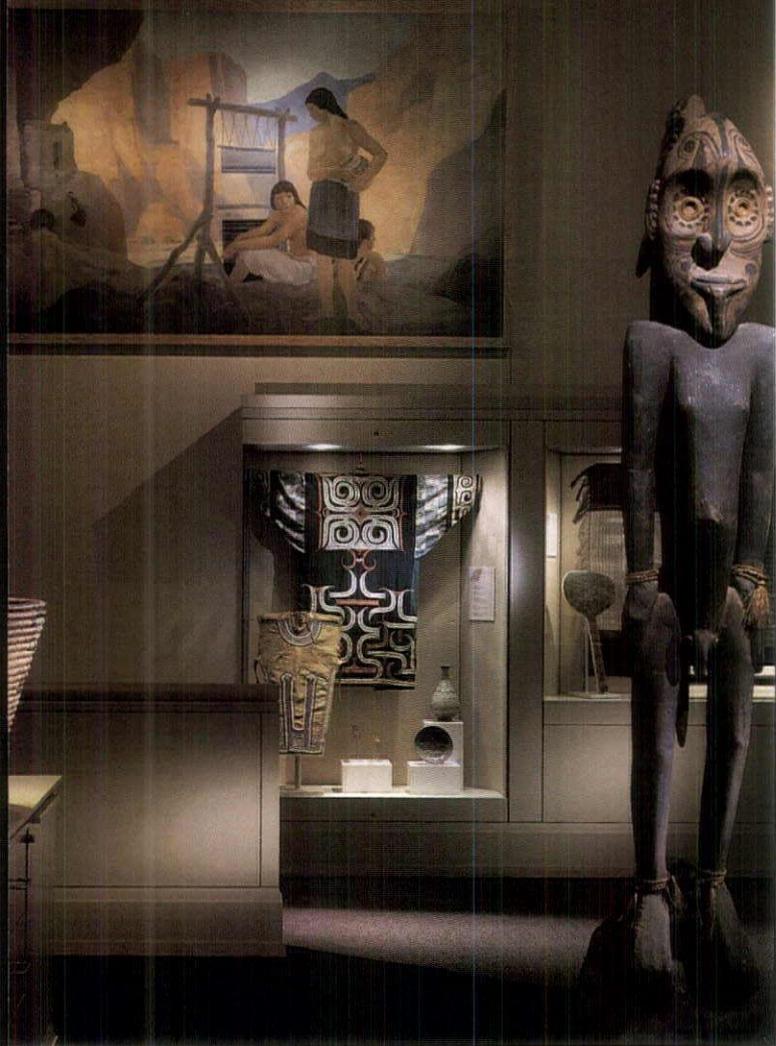


the illuminators so that the museum curator has control over each display area independently, while maintaining constant color temperature.

"Fiber optics successfully delivers uniform light on the displayed objects and minimizes the effects of light degradation from UV and IR energy," said Saylor. "Furthermore, it produces no heat gain, which is also helps preserve the objects."

In addition, fiber optics offers enhanced flexibility without creating design problems to conceal light sources. The fiber optics are small enough to illuminate from behind display supports out of view of museum patrons, and collectively form vertical lighting elements, which provide an even and continual—yet unobtrusive—wash of light along the shelf bays that line the exterior perimeter of the glass box. Another plus: the fiber-optic fixtures require no periodic service, thus the risk of incidental damage is eliminated.

While the many objects on the shelves are lighted by fiber optics, the work space in the center of the glass box is not. This area is supplemented with higher levels of lighting using indirect fluorescent fixtures, located on top of the duct work on both the first floor and mezzanine level, and cord-hung task lights. "When students or curators want to go in and do work on conservation and restoration, they have a higher level of fluorescent lighting in zones which



The track fixtures that light the display cases (above) are concealed above a diffuser at the top of the case, below a lift-up lid. This provides access to the fixtures and eliminates the risk of any unnecessary contact with the precious artifacts.

they can turn on,” explained Saylor. “But on a day-to-day basis, when the collection is not being worked upon, light levels are very low and the space is illuminated only by the fiber optics that line the perimeter of the glass box.”

RIGHT ON TRACK

The main second-floor gallery, in which many objects are displayed in an open area, employs a sophisticated low-voltage track lighting system with UV filtering and dimming capabilities. The suspended track lighting grid houses MR16 lamps mounted high at the ceiling, which provide special lighting effects by accenting individual freestanding objects and illuminating restored wall murals, while eliminating any veiling glare at the perimeter display cases. The lighting buss “floats” within the peaked, two-story space—allowing the architecture to be clearly articulated—and affords complete flexibility to illuminate objects in an ever-changing floor exhibit.

The system is anything but standard: it’s a dual

track which is controlled by seven dimming circuits. This setup allows the track fixtures with integral transformers to operate on multiple control zones or settings, illuminating different areas with varying intensity. “Dimmable preset scene selections let the track use one circuit level to light the wall mural, another to light specific floor objects and more intensity to light the gallery table and storage drawer units in the center of the room where students do research on pieces contained within,” explained Saylor. “Then, another level can be set up for housekeeping when there’s a need for more light. In essence, the controls provide versatility—a series of options can be preprogrammed to suit various functions, but it all comes from one overhead system.”

Unlike the second-floor track system, overhead tracks with incandescent lamps are used in the first floor gallery display that runs around the glass box to spot individual objects that need to be highlighted, as well as in public areas of the museum. All overhead track fixtures are mounted at a high angle to eliminate any possible reflection on display glass.

Emergency lighting is provided by wall-mounted fixtures, which are switched on only upon a loss of power from the emergency generator.

PUT A LID ON IT

Display case lighting is the primary source of illumination around the perimeter of the first- and second-floor galleries. These are illuminated with incandescent adjustable track fixtures with dimmer controls.

The display lighting was designed to be integral with the cases and accessible from above without having to enter the casework for service, thereby eliminating any disturbance to objects. The fixtures are concealed above an egg-crate diffuser at the top of the case, underneath a lift-up lid.

“The lid creates access to the light fixtures so that they can be changed, moved and repositioned without ever actually going inside the display case,” said Saylor. “Not only does this prevent interference with the artifacts, it keeps dirt and dust from being introduced into the environment and eliminates the risk of dropping something on the museum objects.” Moreover, the case lighting is vented to let the heat out through the top.

DETAILS

PROJECT: LOGAN MUSEUM OF ANTHROPOLOGY

LOCATION: BELOIT, WI

OWNER: BELOIT COLLEGE

ARCHITECT: DAGIT•SAYLOR ARCHITECTS—PETER M. SAYLOR, FAIA, PARTNER-IN-CHARGE; ROBERT E. NALLS ASSOC., ANTHONY MIKSITZ, KURT A. RAYMOND

ELECTRICAL ENGINEER: MIKE HEIN, HK ENGINEERS

PHOTOGRAPHER: STEVE HALL@HEDRICH BLESSING

LIGHTING MANUFACTURERS: LIGHTLY EXPRESSED LTD.; FIBERSTARS (ILLUMINATORS); LITELAB; HALO; LUTRON

Order of Protection

LIGHTING THE LOUISIANA PURCHASE DOCUMENTS WITH FIBER OPTICS

The priceless original Louisiana Purchase documents, on loan from the National Archives, are currently displayed at Louisiana's Old State Capitol in Baton Rouge. The entire exhibit, which centers around the large, custom archival display case in which the historic papers are located, tells the story of the Purchase through the presentation of relevant documents and supporting graphics.

While display lighting is obviously necessary to illuminate the contents of the exhibit case, the mere age of the almost 200-year-old Louisiana Purchase documents required that the lighting in no way damage this precious piece of history.

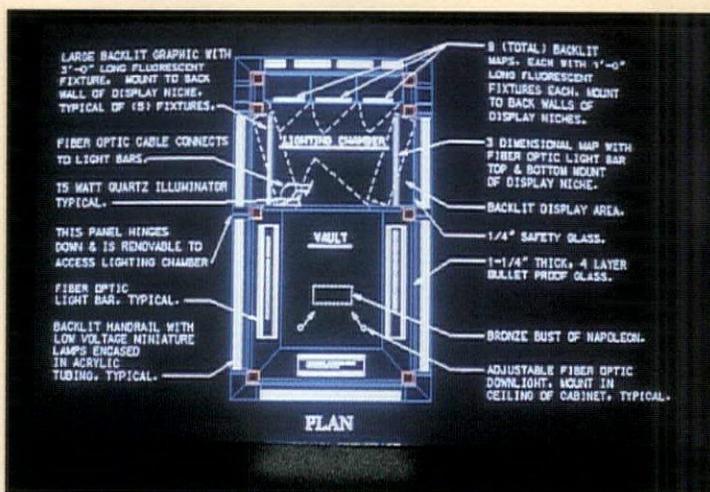
Lighting designer Paulette Hebert, principal in the firm Paulette Hebert Lighting Consultant and assistant professor at the University of Southwestern Louisiana School of Architecture, in conjunction with architect Kevin Harris, AIA, designed a lighting plan that successfully illuminates the exhibit while protecting and preserving the documents from the harmful effects of ultraviolet and heat. As mandated by the National Archives, no more than 5 fc illuminates the fragile documents, and exposure of the documents to light is restricted only to when the documents are viewed. Furthermore, color and textural rendering quality of the lighting is very important. The documents are written in a French "Old World" script, contain their original red wax seals and are marked with creases from age. The lighting must be dimmable and render these characteristics with accuracy and warmth.

Hebert and Harris designed two distinct areas in the exhibit case—the vault, which houses and provides access to the documents and the lighting chamber, which stores the electrical components—in order to separate the light source from the exhibit, thereby eliminating potential destruction. "Fiber optics enabled us to mount the illuminator, cable and controls in a remote location, which removes the heat, yet sufficiently illuminates the display case with 'safe' lighting," said Hebert.

The documents, positioned around the sides of the mahogany exhibit case, are protected by mandatory 1 1/4-in.-thick, four-layer-sandwiched, bullet-resistant glass viewing panels, and are lit by bands of low-level fiber-optic lighting located at the top and bottom of each angled glass panel. The end-lit ferrules, housed in bar-like fixtures, are placed 2 in. on center. All fiber-optic bands are carefully aimed to minimize reflection, and light levels were measured to show compliance with the National Archives footcandle request. The fiber-optic illumination is controlled by a motion detector with a time delay so that the lights turn off when no one is present.

The illuminators—housing 75W MR16 quartz halogen lamps—are located in the lighting compartment of the case, keeping heat and UV physically separate from the Louisiana Purchase Documents. Furthermore, a dimming component on the illuminator enabled the level of light to be adjusted in accordance with criteria set by the National Archives.

An original bronze bust of Napoleon, placed in the horizontal platform above the documents, is illuminated by adjustable recessed fiber-optic downlights mounted in the ceiling. Low-voltage, 10 000-hour-life miniature lamps, 2 in. on center, are encased in acrylic tubing and backlight the "handrails" below the documents, which display



pertinent graphic information about the historic event. These "handrails" are attached to a swing-down door through which one gains access to the lighting compartment of the exhibit case. Flexible conduit with enough slack to open the door to the display case is used. Transformers and all electrical devices are mounted in the exhibit case itself in the lighting compartment, as access to the ceiling space is not possible due to the age of the building. In addition, multiple pieces of monitoring equipment, needed to continuously read heat and light levels, are located within the cabinet. —Christina Trauthwein

DETAILS

PROJECT: LOUISIANA PURCHASE DOCUMENTS EXHIBIT

LOCATION: LOUISIANA'S OLD STATE CAPITOL, BATON ROUGE

EXHIBIT OWNER: STATE OF LOUISIANA—CENTER FOR POLITICAL & GOVERNMENTAL HISTORY—FOX McKEITHEN, SECRETARY OF STATE

EXHIBIT ARCHITECT: KEVIN HARRIS, AIA, KEVIN HARRIS ARCHITECTS

LIGHTING DESIGNER: PAULETTE HEBERT, PAULETTE HEBERT LIGHTING CONSULTANT

LIGHTING MANUFACTURERS: OPTICAL DISPLAY LIGHTING INC.; CRYSTALLITE; ALCKO; SIMPLEX; SYLVANIA





Outside-In

A LUMINOUS "CLOUD" AND WINDOW-LIKE WALL CREATE A NATURAL SETTING FOR WAITING-ROOM PATIENTS

BY CHRISTINA TRAUTHWEIN, MANAGING/DESIGN FEATURES EDITOR

It's a well-known fact that comfort and familiarity can soothe stress and anxiety. This is especially true in the health care field, where many times the right environment can take on healing powers beyond standard medical treatment. Several prominent heart surgeons at St. Luke's Hospital realized this and requested that the Milwaukee Heart and Vascular Clinic be given an airy, open feeling sympathetic to the emotional well-being of patients in need of specialized surgery.

"The clients wanted the waiting room to be restful, non-threatening, pleasant and comforting," said Steven Klein, lighting consultant for the project. "A light, garden-type environment that is seemingly open to the outdoors enables individuals coming in for heart surgery evaluation to feel at ease."

Klein and architect, The Cerreta Group, used elements and images of nature to produce a tranquil environment. Key elements of the design include gentle, bowed cloud-like structures that soften a hard, rectangular-shaped room, as well as an elegant, scenic glass wall. In addition, clean lines, an open floorplan and curvaceous, streamlined furniture all help to unify the space.

Leucos' Formelle architectural glass is used as a dividing wall between the waiting area and an inside office corridor. The intention here had been to create a transparent-looking wall that would give the illusion of being an exterior wall, open to the outside, to set patients at ease. To further the effect of nature, the glass wall is patterned to evoke the theme of earth, water and sky.

Although the glass dividing wall had been a seemingly simple concept, lighting it proved to be the biggest challenge. "As both a thematic instrument and translucent element, we realized the success of the design would be directly affected by whether the wall could be made to appear naturally fenestrated," said Klein. "Making the glass appear to be an actual win-

dow not only enhances the beauty of the material, but would hopefully reduce the stress level of visiting patients by placing them closer to what they believed to be the outside."

To create the illusion of daylighting, Klein decided to mimic two defining components: sunlight and overcast. However, a structural obstacle dealt the lighting designer a bit of a challenge. The ceiling height in the lobby is 10 ft., slightly higher than the 8 1/2-ft. ceiling in the adjacent corridor. In order for the glass wall to extend from floor to ceiling, at least 1 1/2 ft. of the upper portion of the glass wall would be "cut-off" by the ceiling in the corridor beyond. As a result, that portion of the glass wall would always look dark regardless of what was done to light the rest of the glass.

To overcome this problem, the architect suggested the construction of a transitional drywall soffit in the corridor to reconcile the difference between the two ceiling heights. Not only did the addition of the angled soffit prove to be architecturally advantageous, it also benefited the lighting design: the soffit becomes an ancillary reflector from which the light of wedge-like sconces reflects and backlights the green portion of the glass, which occurs at a higher ceiling plane than the rest of the corridor.

BEHIND THE SCENE

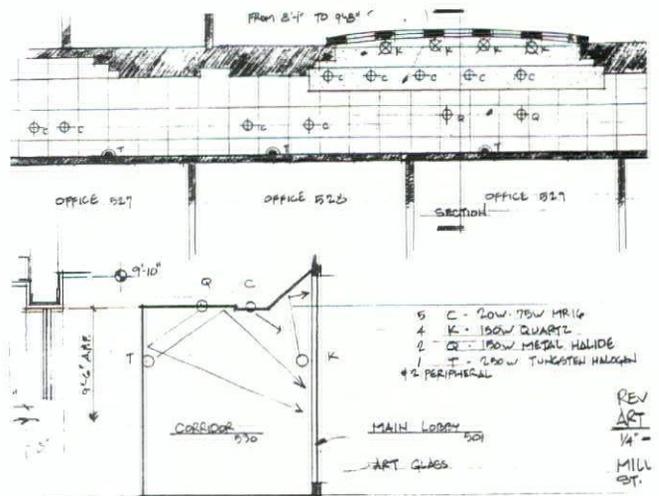
The glass wall is illuminated in three distinctly separate ways. "In order to successfully light a glass partition, you can't directly through-light it from the back without revealing light source images," said Klein. "Rather, the best way to light a glass mural is to have it appear against a uniformly luminous background like the sky, or in this case, an uninterrupted span of wall located directly behind the glass." Consequently, the architect repositioned the door openings in the corridor beyond in order to achieve the desired effect. Next, the trick was to get as even a wash on the wall as possible, and have it be white and bright enough for the glass to appear against a sufficiently lighted background.

To create a uniformly luminous backdrop—or overcast look—two 4100K 150W HQI metal halide lamps in asymmetric flood fixtures wash the corridor wall behind the window to 80 fc, brightly illuminating

The waiting room of the Milwaukee Heart and Vascular Clinic (opposite) features fabric-covered diffusers that "float" within drywall enclosures to create soft, glowing clouds. Blue and green architectural glass, lighted to mimic an exterior wall, soothes and relaxes anxious patients awaiting surgery evaluation.



A decorative glass dividing wall, left, separates the lobby from an inner corridor. The architectural glass is lit in three ways to simulate daylight (drawing, below): metal halide lamps in asymmetric flood fixtures create a uniform wash on the corridor wall behind the window; MR16 narrow spots in adjustable slot-hole aperture fixtures are angled to create shadows on the mullions; and quartz lamps in wedge-shaped wall sconces bounce light off a specially constructed angled soffit to indirectly light the glass.



its surface. These semi-recessed fixtures, which are located in the corridor, create the window's self-luminous appearance and specifically enhance the saturated blue-colored glass.

"However, that is only one element of lighting used," noted Klein. "Backlighting does not create a three-dimensional appearance, nor does it bring life to the window. It merely creates a matte luminous background against which the colors are viewed."

The more important and subtle element of light, the one that brings a sense of reality to the window and carries the illusion a little further, is the point-source lighting placed at a skewed angle in the specially designed soffit. This "sunlight" component, visible both as a reflection in the polished black floor below the glass wall, and upon the window mullions separating each glass panel, is created by direct through-lighting with Q75 MR16 narrow spots in adjustable slot-hole aperture accent fixtures equipped with a beam elongator accessory. The placement of the housings is severely off-set from each glass panel not only to avoid transmitting lamp brightness images through the glass, but to spill light, textured by the hand-made glass, onto some portion of the window casing. "The shadows on the mullions mirror sunlight," said Klein. "And the effect is enough to create a sparkling, refracted image that also reads in the granite, like a reflecting pond."

The third element used to light the glass is indirect lighting. The green glass is illuminated by bounce light from the angled soffit, provided by four wedge-

like wall sconces mounted on the window mullions. Each fixture houses a 150W incandescent quartz lamp, which indirectly lights the uppermost portion of the glass, making it appear to glow. "The angled soffit is more effective than a flat ceiling because its inherent geometric characteristics enable light to be redirected back through the window," said Klein.

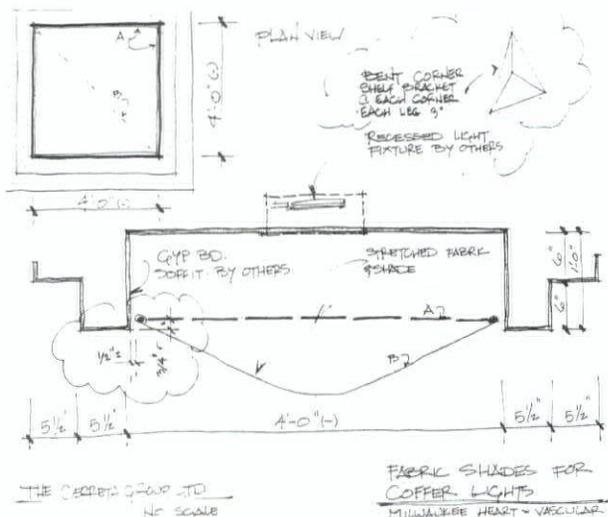
Decorative sconces on the opposite wall of the corridor also use 150W quartz lamps.

CLOUD-LIKE ATMOSPHERE

To carry through on the theme of a calming outdoor environment, the lobby is ambiently illuminated by a billowing cloud-like light structure: a configuration of five 4-ft.-square custom-designed, fabric-covered diffusers that float within dry wall enclosures.

"The ceiling in the waiting area was mostly 2-ft. x 2-ft. acoustical tile, which is typically commercial looking—contrary to the non-institutional design we had in mind," said Klein. "By adding the traditional detail in the form of a luminous ceiling, we were able to fully integrate the lighting concept into the architectural plan."

Klein was influenced by Japanese architect Kazuhide Takahama in designing the "cloud" fixture. "After reading an article about a house he did in Japan, I was inspired by the softness of his forms and by the fact that he designed fixtures that employed fabric wrapped around a wire construction," said Klein. "I immediately knew to use this approach in designing the central fixture for the waiting room."



Ambient illumination is achieved with light from a configuration of five custom-designed fixtures (above). Each "cloud" (drawing, left) houses clear metal halide lamps in canopy fixtures above diffuser panels, which are covered with flame-retardant fabric. Unfinished conduit, joined at the corners to a steel frame, gives the cloud three-dimensional form.

clear metal halide lamps (4200K, 75 CRI). The canopy fixtures measure 20 in. square, and are located 2 ft. away from the diffuser panel to light the whole panel evenly. "There's still a sense of point-source illumination, but the diffuser panel itself reads more or less uniformly," Klein added.

Clear Alzak compact fluorescent downlights with cross-blade baffles and two F26DBXT4/SPX41 (82 CRI) lamps provide fill lighting in the space on the periphery of the seating area.

The components of a cloud are opacity, kineticism and form, Klein explained. The opacity was afforded by a white cloth. The form, a piece of conduit. "It was too difficult to create a circular shape, and too expensive to radius the drywall, so I decided to take fabric and bow it down to give the fixture three-dimensional form, based on Takahama's design," he said. "We used an unfinished piece of 1/2-in.-thick conduit, had it bent, and then welded it to the diagonal corner supports of a steel frame." Flame-retardant rayon fabric is stretched over and secured to the frame, the softly curving shape of the conduit appearing as a silhouette against recessed canopy fixtures, which house 175W

DETAILS

- PROJECT:** MILWAUKEE HEART & VASCULAR CLINIC
- LOCATION:** MILWAUKEE
- OWNER:** ST. LUKE'S HOSPITAL
- ARCHITECT:** THE CERRETA GROUP—TOM WITTE
- LIGHTING DESIGNER:** STEVEN L. KLEIN
- INTERIOR DECORATOR:** MARLENE KING
- ELECTRICAL ENGINEER:** ROMAN ELECTRIC—BRUCE JANICZK
- GLASS INSTALLER:** CONRAD SCHMITT STUDIOS
- PHOTOGRAPHER:** MARK F. HEFFRON
- LIGHTING MANUFACTURERS:** EDISON PRICE; BAROVIER AND TOSA; NORBERT BELFER; ELLIPTIPAR; EMERGI-LITE; PRESCOLITE
- FORMELLE GLASS:** LEUCOS

Bridge Work

LIGHTING DESIGNERS TIM STROBEL AND BEVERLY GADBERRY BRIDGE THE GAP BETWEEN AESTHETICS AND FUNCTION TO HIGHLIGHT A UNIQUE FORM

BY CHRISTINA TRAUTHWEIN, MANAGING/DESIGN FEATURES EDITOR

There's no place more fitting than Missouri to display new and innovative ideas. After all, it is the "Show Me" state. The nickname almost begs one to put their best and brightest plans into action. Well, Tim Strobel of Strobel Energy Consultants and Beverly Gadberry of Kansas City Power & Light did just that when lighting the Parkville footbridge—and they certainly "showed" how a design can be visually appealing yet vandal resistant.

The footbridge was originally one of only two A-truss railroad bridges in the state. After the old bridge was rescued from the wrecking ball, it was moved to Parkville, MO, where town officials set out to preserve the historic structure in a local park located along the banks of the Missouri River. The park, designed like a river walk where residents stroll, jog and bicycle along the water's edge, now boasts the footbridge as its focal point, literally. The monumental "triangle" stands 50 ft. tall, and is about 12 ft. wide and 100 ft. long.

While the bold, geometric shape of the structure is markedly visible by day, at night it could easily fall victim to shadow and darkness. In an attempt to illuminate it, strings of lights were placed up the sides of the bridge, outlining its distinct A-frame in a Christmas-tree-style effect. Well, not only did that prove to be a rather lackluster lighting "design," but the easily accessible—and easily breakable—lights attracted vandal-

ism. "Kids took sticks and rocks and knocked out the lamps over several months' time," said Strobel. The bridge called for a deterrent—durable light fixtures virtually inaccessible to the public, but ones that would illuminate the bridge with flair.

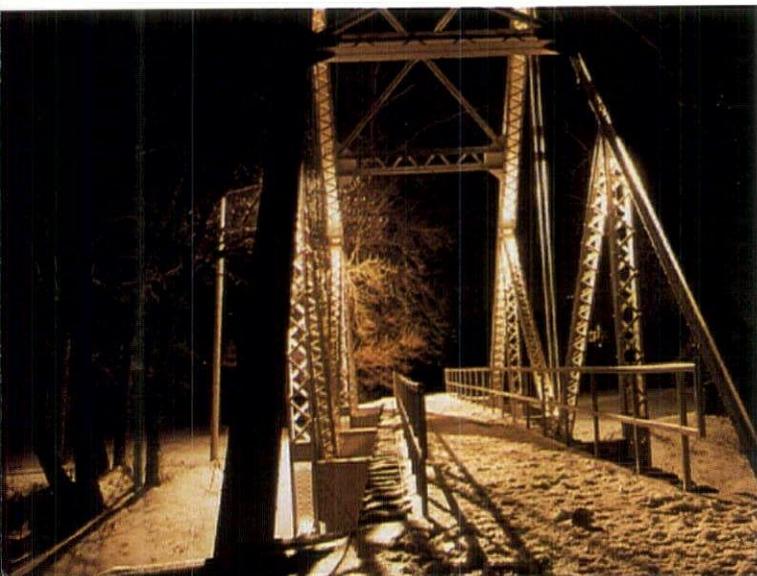
A festive holiday parade organized by Christmas on the River was the impetus for the initial lighting of the bridge, funded by donations from local residents. The design team opted to discard the conventional method for lighting a bridge—metal halide or high-pressure sodium (HPS) lamps uniformly floodlighting the outer portion of the structure—and instead developed a more dynamic design that uses low-voltage MR16 lamps with compact aluminum fixtures as its key elements.

"In this particular case, because of the vandalism, fixtures mounted at ground level would not be appropriate," said Strobel. "Their accessibility would ask for—and get—a lot of unwanted abuse." Furthermore, Strobel wanted to add character and dimension to the architecturally intriguing structure, something floodlighting couldn't accurately achieve. "It's an open webbed truss of beams with scissor-joint angles," he explained. So Strobel took an MR16 out—he always carries one around with him attached to a piece of track for demonstration purposes—and was immediately struck by the glowing effect it created on the structural beams.

CAUGHT IN A WEB

A total of 18 42W MR16 very-narrow spot (VNSP) 9-degree lamps housed in compact anodized aluminum fixtures are mounted inside the junction points of the open web trusses. There are four points like this, with three lamps per group. The MR16s are pointed up and down the trusses, and their high center-beam candlepower creates a glow along the length of the supports to visually define the structure. Lighting the trusses from inside the construction, rather than outside, provides a dramatic contrast between light and shadow.

Furthermore, the discreet location of these fixtures affords security from most acts of vandalism. "The fixtures are not too inaccessible because they're only about 10 ft. off the ground, but they're unobtrusive, which is enough to discourage destruction," said Strobel. "And, the webbing protects them from being broken by thrown objects."



A combination of MR16 and PAR56 very-narrow spot lamps define the triangular shape of the Parkville footbridge with dramatic contrasts of light and shadow. The fixtures are concealed in the bridge's truss system to protect them from vandals.



The remainder of the 18 MR16s used in this project are located at each peak point at the apex of the bridge. These fixtures are faced down, throwing light towards the midpoint spans.

The compact fixtures that house the MR16s are about 5 in. long and 2 in. in diameter. They are mounted to outdoor receptacle boxes and then firmly secured to the trusses by "caddy" clips. In fact, they are so firmly attached that during a flood, when the bridge was two-thirds underwater, the fixtures were still there and the lamps still worked!

In addition to the MR16s, two low-voltage 20W PAR56 VNSP lamps were used at the apex of the bridge. The tight beam pattern of the PAR lamps was required to shine light 40 ft. down to highlight the center vertical chain-link support straps, which extend from the peak to the middle of the bridge. Furthermore, the pool of light created by these lamps hits the center of the bridge and boosts the light level on the walkway for pedestrians.

In order to prolong lamp life, a central time clock/photocell system located on one of the main horizontal support beams under the bridge turns the lights on at dusk and off at about 1 am. City-owned HPS pole-mounted security area lighting remains on all night.

Lamps can be changed without moving fixtures. Extra wire was provided to allow the fixtures to be removed from the truss webbing to make periodic maintenance easier. Three 500 VA transformers located under the bridge, one located at each end and one near the middle, reduce the

length of 10 GA wire required to reach all the lamps.

Now, the footbridge remains lighted each night throughout the year not only as a symbol of the park, but also a symbol of Parkville. It has become a glowing beacon to excursion boats and gambling riverboats that cruise the Missouri.

DETAILS

PROJECT: PARKVILLE FOOTBRIDGE

LOCATION: PARKVILLE, MO

OWNER: CHRISTMAS ON THE RIVER

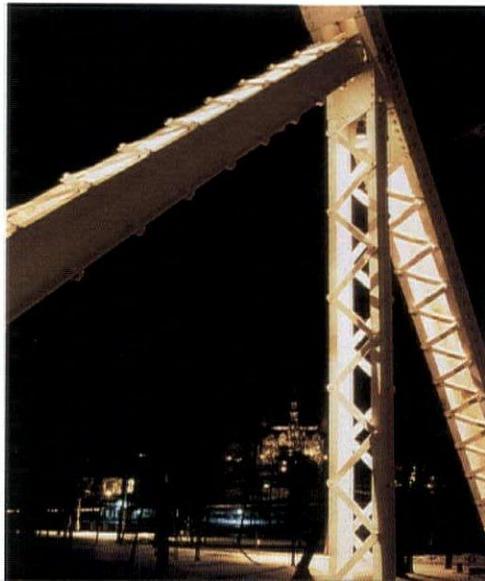
LIGHTING DESIGN/CONSTRUCTION MANAGEMENT: TIM

STROBEL, STROBEL ENERGY CONSULTANTS; CO-DESIGNER:

BEVERLY GADBERRY, KANSAS CITY POWER & LIGHT

PHOTOGRAPHER: CHRIS VLEISIDES PHOTO STUDIO

LIGHTING MANUFACTURERS: GE; LUMIERE



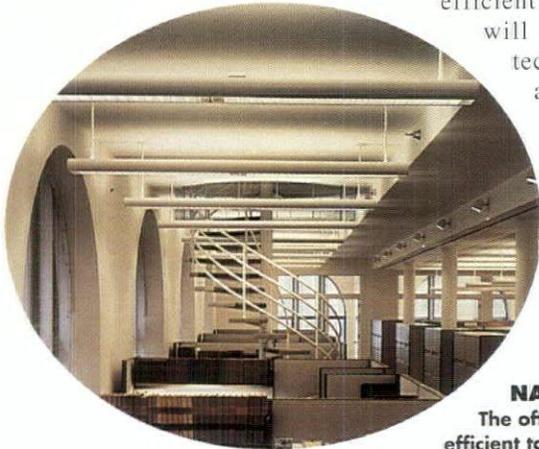
THE ART OF SAVING ENERGY

BY CRAIG DILOUIE, EDITOR-IN-CHIEF

Energy efficiency has been a growing trend in the lighting industry since the 1970s, a time of gas lines, skyrocketing energy prices and Jimmy Carter telling the nation to "sacrifice and save energy." Even after the "Energy Crisis" was officially declared over, the average cost of energy continued to climb 30-50 percent between 1982 and 1992, eating into budgets and profit margins while Ronald Reagan was saying that energy conservation meant "being too hot in the summer, too cold in the winter." By 1989, the U.S. was spending 10 percent of GNP on energy, twice that of Japan and West Germany, reducing the competitiveness of American companies in the emerging global marketplace.

While corporations followed the thinking of our presidents, the lighting industry was listening to the market. New technologies and products boomed, which later made possible industry growth, new legislation, tougher energy codes, EPA Green Lights, utility DSM programs and new client goals for new construction and renovation projects. As energy efficiency shows up more frequently as a client aspiration for a lighting project in the '90s, designers must be knowledgeable of product choices, then creatively capitalize on their advantages and compensate for the down-

sides. In this revisit to energy-efficient lighting, we will review the techniques and approaches employed by some of today's top designers.



NATIONAL AUDUBON SOCIETY/NEW YORK CITY

The offices of the National Audubon Society utilize extensive daylighting and an efficient task-ambient lighting system to minimize electrical load to 0.55-0.70 watts per square foot, much less than New York State's energy code that considers 2.4 watts per square foot to be an efficient space. Open plan offices and interior windows increase penetration of daylight into interior areas, increasing the quality of the lighted environment while reducing load.

ARCHITECT: THE CROXTON COLLABORATIVE

LIGHTING DESIGNER: FLACK+KURTZ CONSULTING ENGINEERS

GENERAL CONTRACTOR: A.J. CONTRACTING

LIGHTING MANUFACTURERS: IPI; LINEAR; LIGHTOLIER; BALDINGER; ZUMTOBEL; TIR SYSTEMS

MARKET CONDITIONS

According to the National Lighting Bureau, some two out of three U.S. nonresidential buildings are at least 25 years old, structurally sound but equipped with older building systems, together representing nearly 60 billion sq. ft. of industrial/commercial building space. The lighting in these facilities was likely designed based on older, much higher, recommended light levels.

Meanwhile, few cities saw "No Vacancy" signs on their commercial buildings in the early '90s. A survey by Cushman & Wakefield, an international real estate firm, posted the national vacancy rate for office space at 16.9 percent in early 1995, despite a modest comeback in major downtown areas.

Given these conditions, owning organizations and commercial property owners alike began embarking on retrofit and renovation of older building systems to reduce operating costs and attract and keep tenants.

ENERGY FIRST?

According to *Buildings Magazine's* 1994 Modernization Survey, for example, more respondents (building owners and managers) were involved in renovation projects than in new construction, with the average respondent's firm spending \$15.9 million on renovations over the year. Most projects involved lighting and most set reducing energy use as a goal. Among the respondents, 55 percent said they were specifying lighting controls; 76 percent indoor fixtures; and 44 percent outdoor fixtures.

Spokesmen for the EPA Green Lights program claim that if energy-efficient lighting were used wherever possible, nearly \$20 billion in energy costs would be put back into the nation's bottom line each year.

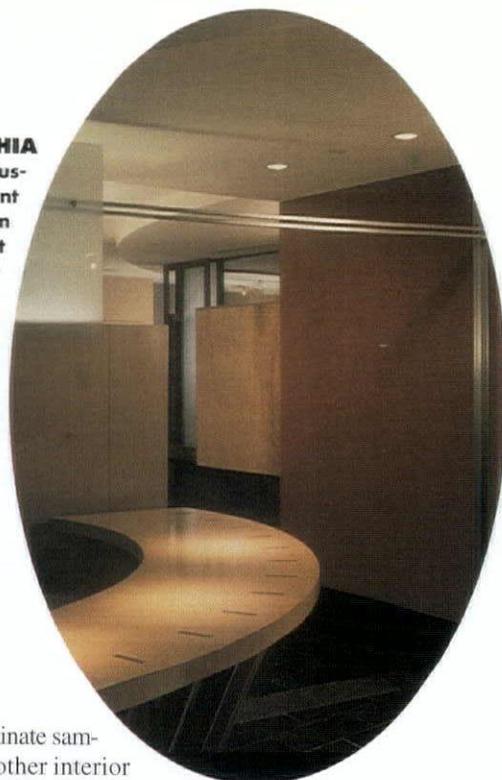
BALLINGER OFFICES/PHILADELPHIA

This reception area with a view toward the conference room and principals' offices illustrates the use of saturated colors and lighted surfaces to create a pleasing environment that is low in energy consumption. Low-voltage halogen spots accent the reception desk. Fluorescent backlighting frosted glass panels provide a backdrop. Fluorescent coves notched into circulation area walls beyond uplight the ceiling plane. Power density for this reception area is 1.8 watts per square foot, with overall power density for the project being less than 1.5 watts per square foot.

ARCHITECT: BALLINGER, PHILADELPHIA

LIGHTING DESIGNER: THE LIGHTING PRACTICE, PHILADELPHIA

LIGHTING MANUFACTURERS: C.J. LIGHTING (T8 FLUORESCENT CHANNELS WITH ELECTRONIC BALLASTS), ARTELUCE "LUCY" (LOW-VOLTAGE ACCENT LIGHTS), EDISON PRICE (COMPACT FLUORESCENT DOWNLIGHTS)



THE ROLE OF AESTHETICS

Some lighting professionals may respond, "What about lighting's purpose? Why not just turn the lights off all the time and save 100 percent on energy?" Certainly, light is for people, and quality lighting is vital to the productive workplace, the dynamic retail atmosphere, the welcoming lobby and so on. An increasingly educated client is aware of this, as well as other dangers of overemphasizing energy, making worker productivity and aesthetics a strong priority. Additionally, with a surplus of building space, commercial property owners view lighting projects as a way to make their buildings compelling and attractive to tenants, not just make the electric bill look good. In many of today's projects driven by efficiency, therefore, we've seen aesthetics enter the picture, and in aesthetics-driven projects the client (or local code) is often telling the designer to minimize energy use. This "coming together" puts today's designer—who can deliver the right blend of professionalism, creativity and product knowledge—in a highly desirable market position.

"More clients are putting efficiency in their list of goals for the space, while desiring greater productivity and the right aesthetics," said Michael Ostaffe, electronic product manager for Advance Transformer Company of Rosemont, IL. "Lighting designers are excellently positioned to handle these projects, especially those they did 10 or 15 years ago with clients where they have an in-road."

A principal challenge facing today's designers is that while the client wants to reduce energy costs, he may be reluctant to accept fluorescent and HID light sources and a higher installation cost. "We're seeing a lot of PL lamps in decorative fixtures, advancements in HID color characteristics and other technologies," said Michael John Smith, AIA, IES, IALD of Michael John Smith Lighting in Houston. "But when fixture costs are higher, the client will expect an answer, especially when the fixture will produce fluorescent rather than incandescent light, a perceived drawback. Designers should invite the client to see a sample installation, or bring fixture samples into the space to build confidence and comfort." He added that for new spaces, he teams up with the interior designer to show the client how

sample fixtures illuminate samples of carpets and other interior materials being specified.

COMBINING CREATIVITY WITH TECHNOLOGY

"By combining creativity with technology, the potential conflict between the virtues of efficiency and the pleasures of good lighting design can be avoided," said Karen Goldstick, director of lighting design services and a senior associate with Flack+Kurtz Consulting Engineers of New York City. "The designer who knows how to use efficient design in the context of a team approach now has the chance to offer clients lighting that not only illuminates well, but has a positive bottom-line effect in reduced operating costs." She pointed to a number of options available to today's designer: new lamps, electronic ballasts, new fixture designs, greater use of daylight, higher reflectances of interior surfaces, sophisticated lighting controls and task lighting combined with lower ambient light levels.

Compact fluorescent downlights, for example, consume 40 watts per lamp compared to an incandescent's 100 watts, Goldstick said. To match the incandescent's warm color appearance, the fluorescent lamp can be specified at 2700K color temperature. Although the fluorescent light will be more diffuse, Goldstick pointed out that this characteristic, combined with other choices of colors, may provide creative opportunities for the designer. In large spaces such as lobbies, where higher lumen output is needed for higher ceiling heights, metal halide lamps, like compact fluorescents, can be substituted for incandescents.

"By combining metal halide lamps with the appropriate reflectors and fixtures, the designer can obtain a great variety of effects," Goldstick said. "And even the new halogen PAR lamps are much more efficient than older PAR lamps. Like many areas of energy-efficient lighting, what might be thought of as a drawback can be turned into a virtue." Goldstick also took special note of sophisticated lighting controls, as the right controls for the space can produce significant energy reductions without affecting aesthetics.

Task lighting provides additional opportunities for



CONCORD MALL/WILMINGTON, DE

The renovation updates the mall's appearance while slashing lighting energy costs by 40 percent. Instead of traditional incandescent downlights, ambient lighting is provided by recessed metal halide PAR downlights. The volume of the space is enhanced by single lamp fluorescent uplight covers using T8 lamps and electronic ballasts, while halogen uplights provide punctuation at the piers. The skylight structure is highlighted at night, dramatically yet efficiently, with blue cold cathode light. Original lighting power density was 2.5 watts per square foot, now reduced to 1.5 watts per square foot.

ARCHITECT: COPE LINDER ASSOCIATES, PHILADELPHIA

LIGHTING DESIGNER: THE LIGHTING PRACTICE, PHILADELPHIA

LIGHTING MANUFACTURERS: KRAMER LIGHTING (METAL HALIDE DOWNLIGHTS), PEERLESS LIGHTING CORPORATION (HALOGEN UPLIGHT IN ARCHITECTURAL ENCLOSURE), NATIONAL CATHODE (COLD CATHODE)

saving energy while promoting quality. In office spaces, lower ambient light levels can be specified for orientation, with task lighting to illuminate workspaces. For a 10 ft. x 15 ft. office with an 8.5-ft. ceiling, for example, the reduction from 55 fc to 35 fc reduces demand from 2.2 watts per square foot to 1.22 watts or less, Goldstick said.

"The key to good energy-efficient lighting design is making efficiency a priority parallel to other design considerations, working with them all to find the optimal design solutions," Goldstick added. "Lighting that is effective, thrifty and virtuous. That's a pretty good combination."

MEETING THE OPPORTUNITY

"The opportunities for energy-efficient lighting environments are increasing continuously with improvements in lighting technology," said Helen K. Diemer, IALD, a lighting designer and associate of The Lighting Practice in Philadelphia. "To make the efficient environment meet the aesthetic goals of the project, creative planning, a thoughtful design and careful selection of products are essential steps."

Diemer noted that the best intentions to save energy can result in design problems dealing with quantity and quality of light. "The light levels after an efficiency-driven renovation may actually be lower than what the client is used to having, due to revised thinking about appropriate light levels for today's interiors," she said. "And many efficient lamp-ballast systems reduce wattage at the expense of light output."

To compensate for lower light levels, Diemer recommended making the space feel brighter by increasing reflectances of interior finishes, and by lighting wall and ceiling planes as well as the task. For example, in a given project a designer may specify direct light sources with high-efficiency louvers for glare control. While this may provide sufficient light for the task, the space may seem dark. For such a situation, Diemer recommended adding supplementary lighting to illuminate wall and ceiling planes to provide visual relief and create the impression of higher light levels. In addition, a planned maintenance program will increase light levels.

Quality of light issues must also be tackled. "Compared to incandescent light, fluorescent and HID light can be deficient in color and texture," said Diemer. "The designer should compensate for deficiencies by carefully selecting material

finishes and colors, and by adding a small quantity of less-efficient sources for sparkle, interest or enhanced color."

Diemer's final advice for designers is to keep an eye on new products, pointing to a variety of new compact fluorescent options, greater lamp color rendering and color consistency of metal halide lamps, and other technological advancements.



MELLON BANK CENTER/WILMINGTON, DE

Renovation of this office building's public spaces and exteriors makes it both more marketable and energy-efficient. The judicious use of warm finishes and halogen incandescent sources results in a high-impact space for less than two watts per square foot. Indirect fluorescent coves and fluorescent wall slots using T8 lamps and electronic ballasts provide the bulk of the ambient light for the space. Dimmer-controlled, custom-designed decorative pendants lamped with energy-saving halogen A-lamps are the apparent source of illumination.

ARCHITECT: MITCHELL ASSOCIATES, WILMINGTON, DE

LIGHTING DESIGNER: THE LIGHTING PRACTICE, PHILADELPHIA

LIGHTING MANUFACTURERS: SIMKAR (T8 FLUORESCENT CHANNELS WITH ELECTRONIC BALLASTS), ADVENT LIGHTING (CUSTOM PENDANTS), LUTRON NOVA (DIMMERS)

ENERGY-EFFICIENT LIGHTING GUIDE

S P E C I A L A D V E R T I S I N G S E C T I O N

Energy-efficient lighting has proliferated in lamps, ballasts and controls, offering lighting professionals a broad array of design solutions. New fixtures are designed to maximize efficiency as well. The future of efficient technology looks even brighter via smart electronics, electrodeless lamps, electroluminescent materials, client and designer education, increasing product reliability and technological advancement.



Garcy/SLP
209 Kirby Road
Portland, TN 37148
Tel.: (800) 221-7913
Fax: (615) 325-7727

The Panel Mount Task Light (PMT) provides task level illumination to applications without overhead storage. Often, low panels in some furniture system layouts restrict the use of traditional undershelf task lights. The PMT attaches directly to the panel with special mounting brackets to illuminate the work surface in such situations. The PMT's sleek wedge shape adds a distinctive design element to the work station, and houses an energy-efficient T8 lamp and electronic ballast system.

Circle No. 60



Beta Lighting
1200 92nd Avenue
Sturtevant, WI 53177
Tel.: (414) 886-2800
Fax: (414) 886-2779

Beta Lighting introduces a revolution in pedestrian scale walkway lighting with the new Prismatic Area Light (BAH Series), which features even illumination and uplight from its highly efficient, glare-free reflector. A round pole with slide-in ballast is furnished. The Prismatic Area Light accommodates 35-175W lamps and will be available during the first quarter of 1996.

Circle No. 61



Motorola Lighting Inc.
887 Deerfield Pkwy.
Buffalo Grove, IL 60089
Tel.: (800) MLI-0089

Helios electronic dimming ballast from Motorola Lighting is designed for cost-effective, high-performance

architectural dimming for fluorescent lighting systems. Helios controls light levels from 100 to 10 percent and increases energy savings. The ballast is compatible with 0-10V DC dimming controls, ambient light sensors and occupancy sensors. Helios is suited for applications including classrooms, conference rooms, boardrooms and executive offices.

Circle No. 62



C.E.W. Lighting, Inc.
14040 Welch Road
Dallas, TX 75244
Tel.: (800) 255-LAMP
Tel.: (800) 242-LAMP (TX)
Fax: (214) 387-9711

CYCLOPS provides a halogen MR16 120V replacement for PAR and R lamps that are prohibited from being manufactured or imported after October 31, 1995 by the Energy Policy Act of 1992. CYCLOPS reduces energy consumption by 33-66 percent, while providing the same or higher light levels. Lamp life is increased from 2,000 to 5,000 hours. Twelve different beam patterns allow focused spotlighting or wide area lighting. Available in 12/20/35/50W versions, CYCLOPS can be used in most 120V recessed cans and track lighting type fixtures that presently use PAR38 and R40 lamps. Circle No. 63

LANDSCAPE LIGHTING: MIXING IT UP WITH LOW-VOLTAGE AND HID

BY RICHARD L. KARNES

The conventional wisdom of residential landscape lighting has leaned toward selection of standard 120V incandescent light sources, with low-voltage lighting becoming more popular in recent years. Manufacturers, however, now offer lamps and fixtures designed to be more compact and efficient, such as low-wattage high intensity discharge (HID) and fluorescent, offering even more choices and combinations.

While the unique challenges and opportunities of each project should be approached individually, an effective non-traditional approach to lighting the residential landscape is combining low-voltage with HID sources. Caution is the key to mixing light sources, of course, but well-researched combinations can produce energy conservation and maintenance benefits for the client, new avenues of creative expression for the designer, and pleasing aesthetic results for both parties.

HID SOURCES

Low-wattage HID light sources are compact, highly efficient, long-life and offer a diverse range of color qualities. Better efficacy (lumens per watt) enables applications requiring larger areas of coverage to be lighted with fewer fixtures. These installation savings can sometimes offset the higher initial cost of HID equipment. Additionally, the color-enhancing properties of HID lamps are exceptional. From the cool green

of mercury vapor to bright white light of metal halide to the warm amber of high-pressure sodium (HPS), designers can enjoy a diverse palette. And rated lamp life exceeds standard incandescent life; HPS lamps are rated as high as 24,000 hours.

When selecting HID sources, however, consideration should be taken regarding color shift and lumen depreciation. Also remember that HID lamps require a startup period, that many undergo a restrike period if extinguished, and that they can be intolerant of voltage fluctuations and undervoltage operation.

LOW-VOLTAGE SOURCES

Low-voltage sources are compact, available in numerous wattages and beam spreads, and are offered in an endless variety of fixtures. The small filament design provides control with limited spillage. Manipulation and concealment is further promoted with accessories such as shields, louvers, lens and filters generally not offered for incandescent sources used on the exterior.

Incandescent lamps tolerate some voltage drop with little visual difference, while voltage drop can become critical when low-voltage installations require remote transformer locations. Multiple low-voltage runs must be calculated to provide equal voltage at all fixture locations—otherwise, illumination calculations will be in vain. Some voltage drop and/or dimming can work favorably by increasing lamp life.

Note that low-voltage lamps, although generally safe if properly used, typically operate at high temperatures. Caution should be used when the fixture is accessible to children during operation.

MIXING IT UP IN FLORIDA

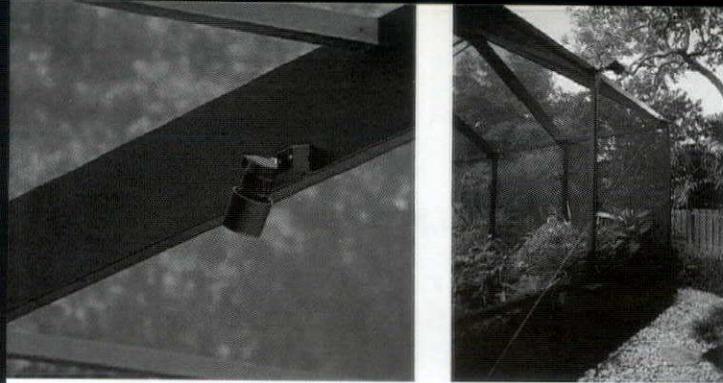
Evenings anywhere in the world offer a wonderful blank canvas for bringing life to architectural and landscape details often lost in darkness. Through careful selection of light sources, color and form are enhanced, creating the intangible and making a space as pleasing by night as by day.

Such is the case of the following residence in Naples, FL—a place where the climate encourages a lifestyle in which home exteriors become an extension of the interior all year round. When the owner felt it was time to renovate the pool area, Lotus Tropical Gardens & Bonsai, Inc. was contracted to transform the area into an oasis.

The new water garden gained ample room with the addition of another 15 ft. to the rear area. A screen enclosure was built to



In a Naples, FL residential landscape project, low-voltage and metal halide lamps were combined for dramatic effect. Focals come to life and filtered light fills the space, enhancing green tones while reflections create a new perspective.



Small low-voltage fixtures mounted on the screen enclosure's overhead structure worked well in keeping with a clean daytime appearance. Furthermore, the enclosure's channel was approved by local authorities to be used as a raceway, allowing all low-voltage wiring to be concealed.

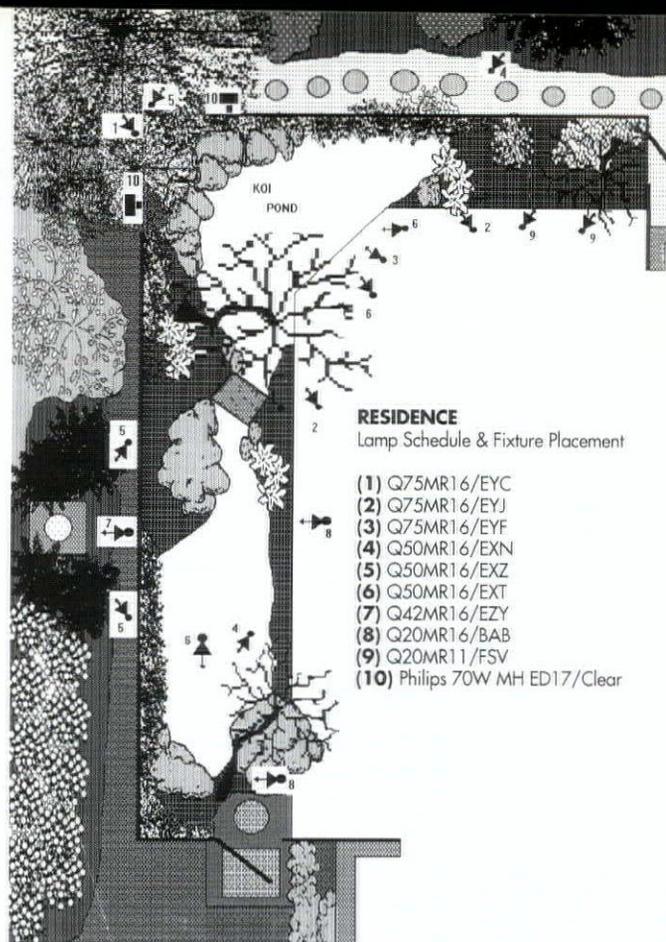
A compact HID fixture was then selected that visually blends into the horizontal line of the structure when observed from the main viewing area.

permit the family room, living room and master bedroom sliding glass doors to be opened during the cooler winter months without insect intrusion. The main waterfall was placed in an area visually framed by the architecture as one enters the home, with a koi pond that runs the length of the lanai to a smaller waterfall. In keeping with the aesthetically correct principle of providing odd numbers of focals within a space, the existing cherub fountain was retained and through selective use of plants became part of the visual and audible experience.

Recognizing the value of professional lighting design, Lotus asked me to join the project during the conceptual stages. One of the greatest challenges to lighting this space involved keeping stray light off the screen enclosure, creating the illusion that the outside areas and inside areas are visually one. To achieve this goal, low-voltage lighting was chosen as the main design tool due to its ability to be controlled and manipulated using techniques involving a variety of lens and filters. A theatrical approach was then taken using the enclosure's overhead structure for placement of virtually every fixture, treating the landscape and water features as a stage. Not only did this allow for easy layering of the lighting, but it placed fixtures in a protected environment—away from possible damage and jarring out of focus.

Our next obstacle to surmount, often associated with screen enclosures, was the visual loss of illumination on objects located on the opposite side from the viewing area due to the screen's density. Creating the illusion that the landscape flowed out and encompassed the cherub fountain was relatively easy with low-voltage, but the expanse of the tree acting as an overstory to the main waterfall would have taken numerous fixtures to create the required drama. As an alternative, HID sources were selected, reducing the total fixture count and reducing operating costs.

The first step involved selecting a source whose color rendering qualities would complement the extensive use of filtered low-voltage lighting. Research indicated that 70W medium-based metal halide lamps with a color temperature of 4200K and a color rendering index (CRI) rating of 70



Upon completion, an as-build rendering with fixture locations and lamping was provided along with one spare low-voltage lamp of each type, ensuring the original design will be kept intact.

would accomplish this task—and, when used in a fixture with an asymmetrical reflector, would achieve the desired level of illumination and coverage. To avoid large, bulky equipment typically associated with HID lighting, an optional long-range ignitor was specified, locating the remote ballast enclosure discretely behind the wall where it is hidden from view.

In addition to the metal halide illumination pushing upward, one low-voltage fixture is positioned in the tree's canopy, pushing light downward and highlighting the tree's graceful form and structure. The elevated level of illumination and the complementary contrast of the two light source types working together draw one outside and upward, accentuating the primary focal point in this space.

Richard L. Karnes is principal of R.L. Karnes Lighting Design of Naples, FL.

DETAILS

PROJECT: PRIVATE RESIDENCE

LOCATION: NAPLES, FL

LANDSCAPE AND WATER FEATURES: LOTUS TROPICAL GARDENS & BONSAI, INC.

CONTRACTOR: DAVES ELECTRIC

PHOTOGRAPHER: JOHN SCIARRINO, GIOVANNI PHOTOGRAPHY

LIGHTING MANUFACTURERS: GE LIGHTING (MR16S); GREENLEE LANDSCAPE LIGHTING (METAL HALIDE FIXTURES); IWASAKI (MR11S); LUMIERE DESIGN AND MANUFACTURING (LOW-VOLTAGE FIXTURES); PHILIPS LIGHTING COMPANY (METAL HALIDE LAMPS)

FIBER-OPTIC LIGHTING: TECHNOLOGY, BENEFITS, APPLICATIONS

BY WESLEY G. MOHR, JR.

Fiber-optic lighting, first made commercially available about a decade ago, has undergone impressive growth in the capabilities of the technology and the size of the industry. In this discussion, we will review the benefits and fundamentals of the technology, discuss new developments and look at two exciting applications of fiber-optic lighting used for both linear- and point-source illumination.

BENEFITS OF FIBER-OPTIC LIGHTING

Fiber-optic lighting provides the benefits of remote-source lighting in commercial and residential applications, both indoors and out. To provide illumination over a given area, only a single halogen or HID light source is required to power all or part of a particular fiber-optic installation. Similarly, a single object, such as a museum piece, can be economically lighted from many angles and directions from multiple fixtures. Fiber optics can readily supplant multiple electrical light sources that usually add up to greater wattage.

The illuminator can also be located remotely, at or near floor level, ideal for hard-to-reach fixtures. Fiber-optic tubing produces no heat, ideal for retail, museum and similar applications. No electrical current is passed through the tubing, ideal for hazardous and wet locations such as underwater and landscape applications.

No electromagnetic fields are produced around the tubing, ideal for use with sensitive electronic equipment. And no voltage is required at the fixture, making fiber-optic lighting ideal for special locations where a standard electric fixture would be costly and difficult to wire and maintain.

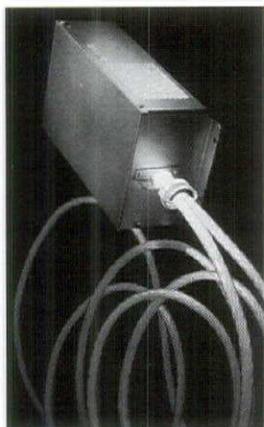
ANATOMY OF A FIBER-OPTIC LIGHTING SYSTEM

A fiber-optic system generally involves three components: the light source and its housing, fiber-optic tubing and, for end emission, the receiving-end fixtures fitted to the tubing.

The number of light sources now available for producing fiber-optic illumination has grown from a handful of MR16 tungsten-halogen lamps to include powerful, long-lasting 150W and 400W metal halide lamps.

The light source, housing and power supply together as an assembly are called an "illuminator." Inside the illuminator there is a reflector. When the light source is activated, the reflector focuses the visible light waves into one end of the fiber-optic strands.

This can cause the fiber-optic tubing to light up, similar in appearance to neon tubing, for linear applications. Or the tubing can terminate at one or more point-source fixtures to distribute the light in a desired pattern, an exciting new development.



CONTROLS AND FILTERS

As an option, the illuminator can be fitted with a dichroic glass color wheel filter to provide a continuous or fixed change of color. Computerized programming controls can be used to provide special effects, such as timed light changes or strobe-like bursts of light. Multiple illuminators can be synchronized. These can be integrated with music on a sound system or varied by time of day, greatly expanding the types of creative applications ideal for fiber-optic lighting.

Infrared (IR) and ultraviolet (UV) wavelengths produced by a given light source have long been undesirable by-products of lighting. Using fiber optics, these wavelengths can be easily filtered out prior to entering the fiber, eliminating the damaging effect of UV or IR energy on objects or materials being illuminated.

LINEAR- AND POINT-SOURCE ILLUMINATION

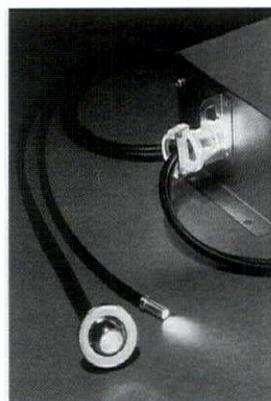
Prior to this year, most fiber-optic lighting applications were linear, replacing neon or standard incandescent or fluorescent cove lighting.

But now, breakthroughs in efficacy and reduction in size of the illuminator have enabled fiber-optic lighting to be utilized for point-source applications.

Various types of aimable, reflecting or diffusing fixtures can be fitted at the end of the fiber-optic tubing. Such fixtures heads have essentially taken two forms on a readily available production basis—landscape fixtures and recessed ceiling downlights.

New outdoor fixtures include above-ground bollards, step and walkway lighting, path or border lighting, wall-washing or shrubbery-illuminating spotlights and floodlights, and in-ground fixtures. Since no electrical current passes through the fixture, fiber-optic lighting is ideal for wet or damp locations.

New recessed ceiling downlights, like their more traditional counterparts, can offer aiming capability and light-enhancing lenses, and only the trim is visible. Because the light source is located remotely, fixtures can be positioned in inaccessible areas. And because no electrical current runs through the fixture, fiber-optic downlights can be used in place of more costly explosion-proof fixtures in hazardous or classified locations.



Wesley G. Mohr, IES, IALD, LIRC is VP, general manager of the commercial lighting division of Fiberstars, Inc. in Fremont, CA.



LINEAR APPLICATION: RC THEATRES

Located in what has become known as the “downtown” of Virginia Beach due to the density of offices, restaurants and shopping malls, RC Theatres required a lighting design that would attract customers amidst a multitude of spending opportunities. Added to this challenge was a limited budget, maintenance concerns and a hodgepodge of adjacent lighting.

Considerable research was conducted in how best to illuminate the imposing 40-ft. glass and steel archway entrance—a “make or break” focus of the building. Although other neon lighting existed in this location, there were serious concerns as to its stability under wind conditions and with its maintenance. Fiber-optic lighting was found to be the most functional, practical system that could co-exist with neon and still negate breakage and recharging issues.

A 1/8-in.-diameter fiber-optic tubing was used to outline the arches. Because of its flexibility and the ability to be field cut at any length, installation was considerably less costly. Compact UL-listed illuminators with a 4000K, 6,000-hour lamp powered the fiber-optic system. With estimated usage of 2,000 hours each year, the illuminators needed only to be relamped on average about every three years. To create the dramatic, eye-catching effect necessary in this busy commercial environment, each illuminator contained an eight-color wheel filter electronically synchronized to change the color of each of the arches in unison.

As the first installation of fiber-optic lighting in this area, the RC Theatre Complex has already won an award for the Tidewater IES Section. Fiber-optic lighting helped the owner create an attention-getting and profitable venture, which met the needs of the business and which will maintain its appeal for many years to come.

PROJECT: RC THEATRES

LOCATION: VIRGINIA BEACH, VA

ARCHITECT: STEVE DESIGN, CRR ARCHITECTS

ELECTRICAL ENGINEER: FRED ASHER, CHERWA EWING

ELECTRICAL CONTRACTOR: ELLIS IVES, EH LIVES INC.

PHOTOGRAPHER: CRAIG AVANT, HELFRICH-BURKE

FIBER OPTICS MANUFACTURER: FIBERSTARS, INC.

POINT-SOURCE APPLICATION: ENGLISH TUDOR

Margaret Lesher’s 1930 English Tudor estate went through a major overhaul that involved 41 interior designers and cost more than \$1 million. Ms. Lesher, chairman of the board for Lesher Communications, Inc., graciously allowed her estate to be used as a Designer Showcase, with proceeds benefiting local charities. One of her priorities was “dramatic lighting.” Other design challenges included the master bath, where the lighting needed to create a dramatic effect while remaining unobtrusive and resistant to moisture.

Small recessed fiber-optic fixtures, lighted by a 250W quartz halogen lamp in a remote UL-listed dimmable illuminator, were placed around the perimeter of the soffit to emit functional and decorative light. The small profile of the light sources allows the light, not the fixtures, to make the statement.

By using fiber optics in lighting, one of the new effects created was a star-field ceiling. In this application, individual fiber-optic strands were mounted in a faux-painted dome to form the star field. The illuminator was equipped with a special-effects wheel to produce a realistic twinkling-star effect.

Because fiber-optic lighting is not affected by moisture and does not contain a lamp at each fixture or point of light, steamy showers and long soaks in the tub will not affect the life of the lights. In addition, the fiber-optic fixtures only require a mounting clearance of 3 in. and do not contribute additional heat to the space. Simple maintenance involves lamp replacement at the illuminators, which are located in a remote, dry location.

PROJECT: MASTER BATH, 1995 EAST BAY DESIGNER SHOWCASE

LOCATION: ORINDA, CA

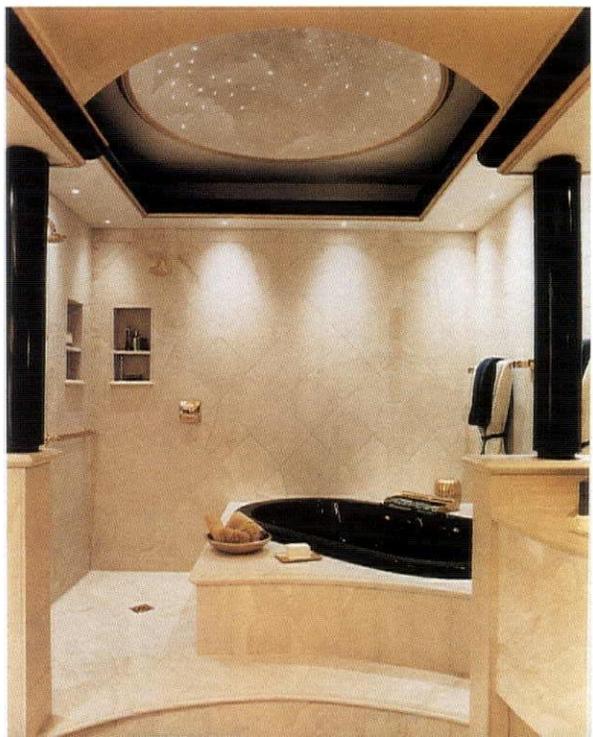
LIGHTING DESIGNER: BRIAN FOGERTY AND DANA L’ARCHEVESQUE, AXIOM DESIGN, INC.

FIBER OPTICS CONSULTANT AND INSTALLER: DON LIBERMAN, FIBER CREATIONS

INTERIOR DESIGNER: JIM WALLEN, CKD AND ALBERT CAREY, ASID, ACORN KITCHENS AND BATHS

PHOTOGRAPHER: DAVID LIVINGSTON

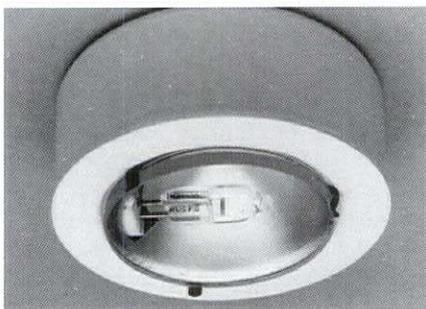
FIBER OPTICS MANUFACTURER: FIBERSTARS, INC.



GOOD THINGS IN SMALL PACKAGES

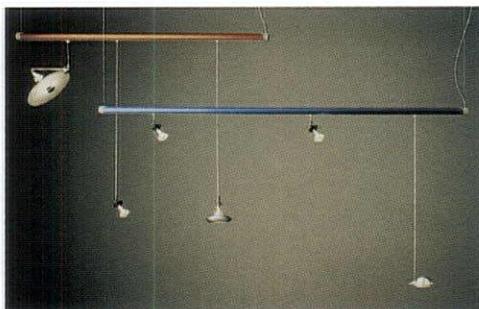
Today's small fixtures enable maximum lighting performance with minimum dimensions, which means lighting professionals no longer have to sacrifice design due to size constraints. Small-scale fixtures, with slim profiles and crisp lines are versatile, and can easily be integrated into

virtually any commercial or residential application. And since miniaturized units accommodate compact lamps, the designer is able to accent hard-to-reach locations with small powerful sources of lighting. Following is just a sample of what manufacturers are offering in small-fixture design.



FC LIGHTING

FC Puck Lights, low-voltage circular undercabinet fixtures, are available in black, white, brass and chrome. Recessed or surface-mounted, Puck Lights come with 20W bi-pin halogen lamps and tempered glass lenses. **Circle 35**



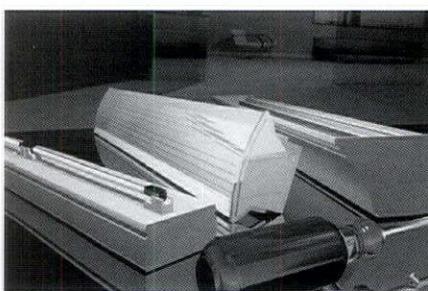
FLOS INC.

Created by architects Perry A. King and Santiago Miranda, the Expanded Line Network of track lighting is a modular, low-voltage halogen linear lighting system developed to provide users with a flexible low-scale, minimalist design. The Network provides infinite variations of track height and adjustable lighting patterns. A palette of metallic and clear-coat finishes are offered on 10 fixture heads: Aloa, Halo, Lucy, Ole, Ra, Tor and four models designed by Matteo Thun. The line is especially suited for hospitality, retail, residential and office lighting. UL-listed. **Circle 36**



CSL LIGHTING

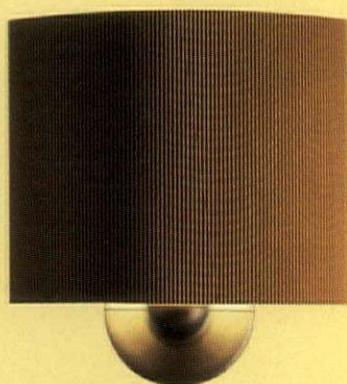
Mitelite miniature halogen undercabinet lighting fixture is fully dimmable with an instant-on 11.5V integral electronic transformer. The fixture accepts 20W halogen lamps and measures 1 1/4 in. deep x 2 in. wide to make it completely unobtrusive. **Circle 37**



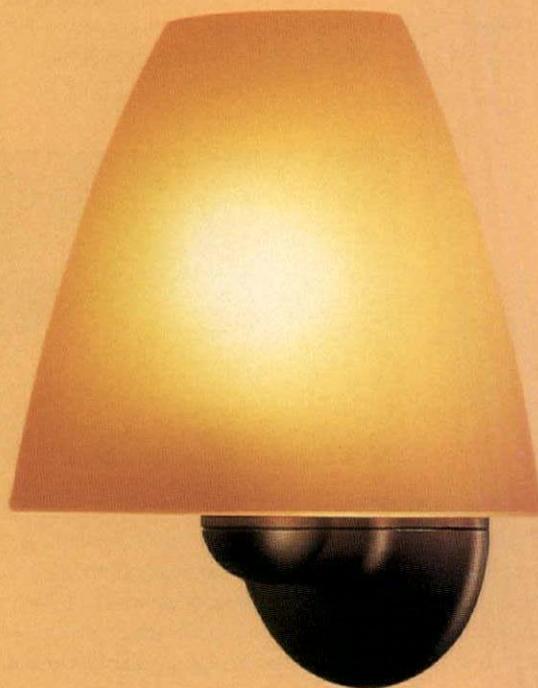
STARFIRE LIGHTING, INC.

The TruLux family of fixtures is designed to accommodate Osram Sylvania's T2 lamp, which is the size of an unsharpened pencil and generates the same lumen output as an equivalent-wattage, but larger, compact fluorescent lamp. The collection includes seven product series: Basic; Cove and Sconce, which offer a linear light control system housed in decorative profiles; Valence, which consists of three decorative linear bath fixtures with reduced glare diffusers; and Undercounter, which is only 1 in. thick. **Circle 38**

CHARLIE



SALLY



PIPERITA



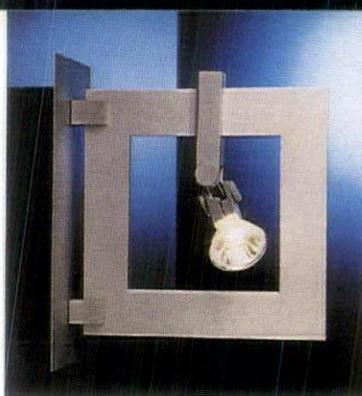
DESIGNED BY MARCELLO ZILIANI

FLOSUSA

FLOS USA INC. 200 M'KAY ROAD HUNTINGTON STATION NEW YORK 11746 TEL 516 549 2745 FAX 516 549 4220

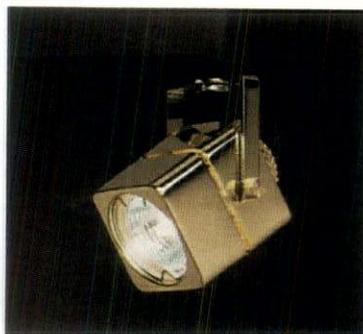
1 800 939 3567

Circle No. 22 on product service card



INDUSTRIE AND DESIGN LIGHT

A flexible, hand moldable aluminum low-voltage halogen track lighting system, part of the Alulite line of lighting products, holds its shape after bending. The German-made track system features three different swiveling light projectors positioned at zero, 180 and 360 degrees, which accept 20W, 35W or 50W coolbeam spot or flood lamps. **Circle 39**



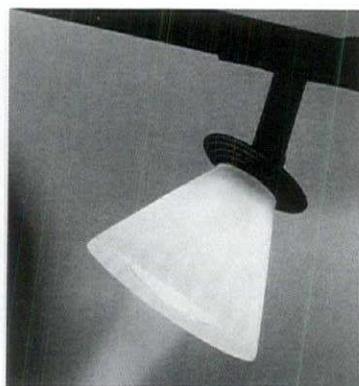
W.A.C. LIGHTING CO.

Miniaturized halogen track heads designed for MR11 halogen lamps include model HHT1102 (shown). These small units offer cool operation and controlled beam spread. The units are available in four colors: gold with black for black tracks; gold with white for white tracks; solid black; and solid white. **Circle 40**



TECH LIGHTING

Acrobat fixtures, designed for the company's Kable Lite system, feature tiny, sculpted men that dive, climb and reach to support MR11 halogen lamps. Acrobats are available individually as two-man fixtures or as a kit, which includes two of each style. Steel or patina finishes are available. **Circle 41**



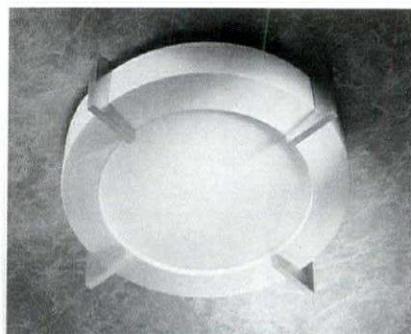
LUCIFER LIGHTING CO.

The Cono decorative spotlight, designed for the Altima track and spot system, features a frosted glass diffuser available in either cobalt blue or opal glass. The fixture can be fully rotated and the stem can be adjusted to 90 degrees. The spot uses MR11 and MR16 halogen lamps up to 50W. **Circle 42**



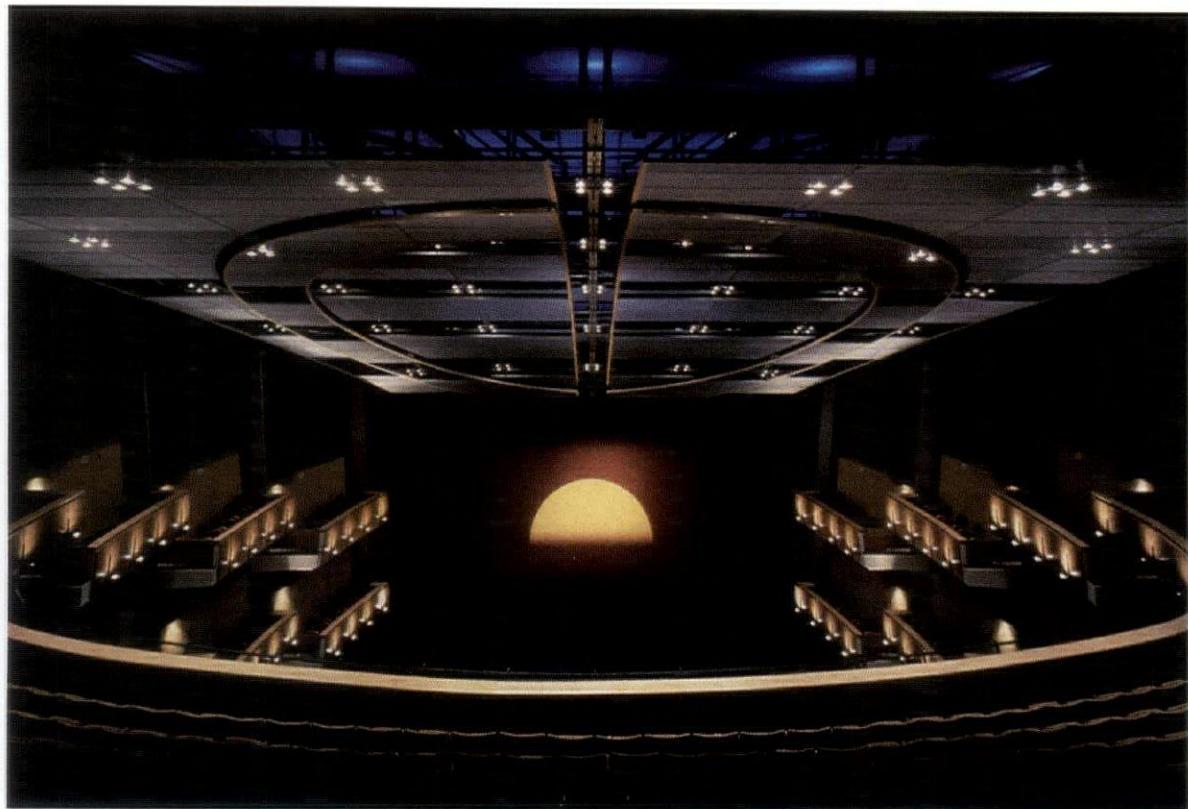
JUNO LIGHTING INC.

Trac 12 is a low-voltage miniature lighting system that provides a seamless strip of track with tiny lampholders. Xenon lamps provide clear, clean light with excellent color rendition, and can be dimmed. For a continuous track, use joiners or connectors. The track is wired to a small, remote transformer. This system is ideally suited for residential applications such as cabinet, library or cove lighting. **Circle 43**



HALO LIGHTING

Nautilus is a contemporary-looking surface-mounted compact fluorescent fixture that features a circular shape with aluminum winged accents. A diffuser lens provides soft ambient lighting. Nautilus meets ADA requirements. **Circle 44**



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1

1. OUTDOOR BOLLARDS

Architectural Landscape Lighting's (ALL) LL-10 line of vandal-resistant outdoor lighting bollards are characterized by a distinctive, architectural "finned" design. Sturdy "fins" made of heavy-gauge cast aluminum surround the entire length and circumference of the fixture's clear polycarbonate or acrylic lenses. LL-10 fixtures are available from 36 in. to 96 in. tall in dark bronze, black, green standard or custom colors. They are designed for 18-150W HID lamps, and are UL-listed for use in wet locations. Architectural Landscape Lighting, Santa Ana, CA. **Circle No. 50**

2. FIBER-OPTIC LANDSCAPE

The FiberScope series from Fiberstars, Inc. brings the benefits of fiber-optic technology to landscape lighting. The FiberScope system consists of an illuminator box that houses a metal halide or quartz halogen lamp connected to a low-voltage power source. The illuminator is connected to the type of landscape fix-

ture desired via flexible fiber-optic tubing. Light is piped from the illuminator to one or several fixtures depending on the design to spot-illuminate a single architectural feature or floodlight entire areas. There is no electricity, wiring or heat at the fixture, and lamps are replaced at the illuminator location only. Fiberstars, Inc., Fremont, CA. **Circle No. 51**



2

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3. FLUORESCENT BREAKTHROUGH

Philips Lighting's Alto fluorescent technology, initially available in the company's T8, T12 Spec Econ-o-Watt and T12 Ultralume Econ-o-Watt lamps, enables these lamps to

meet the EPA's stringent hazardous waste characterization standards (TCLP test at end of lamp life) at no additional cost and without sacrificing longevity or efficiency. Lamps employing Alto utilize a new capsule

injection dosing system to deliver less than 10 mg. of mercury, in comparison with the industry average of 22.8 mg. in a 40W fluorescent lamp (1994 NEMA estimate). Philips Lighting, Somerset, NJ. **Circle No. 52**

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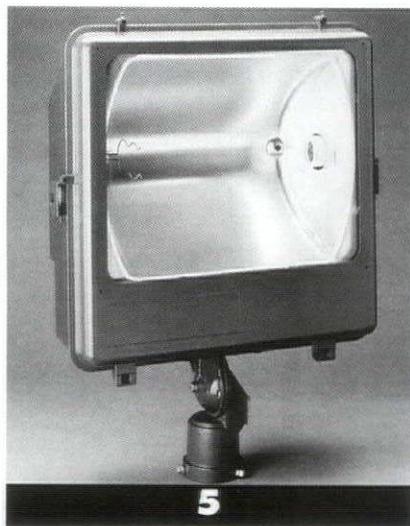
NEW PRODUCTS



4. SPOTLIGHTS

Xenotech, Inc.'s Britelight 7000ART architectural spotlight provides a peak beam of 795 million candlepower, able to register a brightness of 12 fc two miles from the source. The Britelight 7000ART weighs 95 lbs., measures 24 in. x 24 in. x 24 in. (with a height of 32 in. including

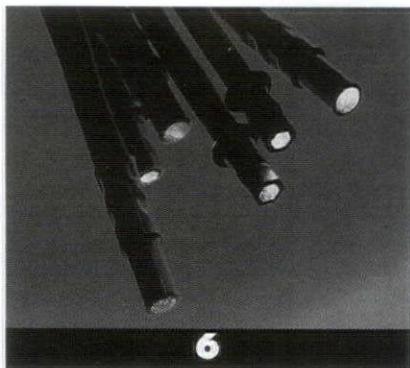
the yoke), draws 7,000 watts and is equipped with an 185-lb. power supply. Using a programmable mechanical articulation system, the Britelight 7000ART is fully automated with both a vertical and horizontal range, and can be positioned manually to create different patterns. ETL-listed. Xenotech, North Hollywood, CA. **Circle No. 53**



5. FLOODLIGHTS

Thomas and Betts has introduced two new American Electric Lighting products: UltraFlood 75 and 77 heavy-duty floodlights. The UltraFlood fixtures are available in 150-1,000W high-pressure sodium or 175-1,000W metal halide and mercury vapor in two sizes, and offer a range of voltages, floodlighting options and other uses in a variety of commercial and industrial

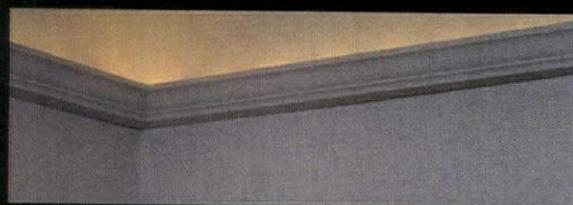
uses. Designed for easy installation and maintenance. UL-listed for wet locations. Thomas and Betts, Memphis, TN. **Circle No. 54**



6. FIBER OPTICS

Lighting Services Inc.'s fiber-optic lighting system is comprised of a remote light source (150W metal halide or 50W tungsten halogen), bundles of light-carrying glass optical fibers and lighting instruments (lightbars or fixtures) for museum, retail and a variety of other applications. Fiber-optic lightbars and fixtures eliminate UV and infrared wavelengths, making it ideal for lighting heat- or UV-sensitive objects and for architectural spaces that pose a problem for electrical wiring. **Circle No. 55**

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