ARCHITECTURAL LIGHTING

January 1989
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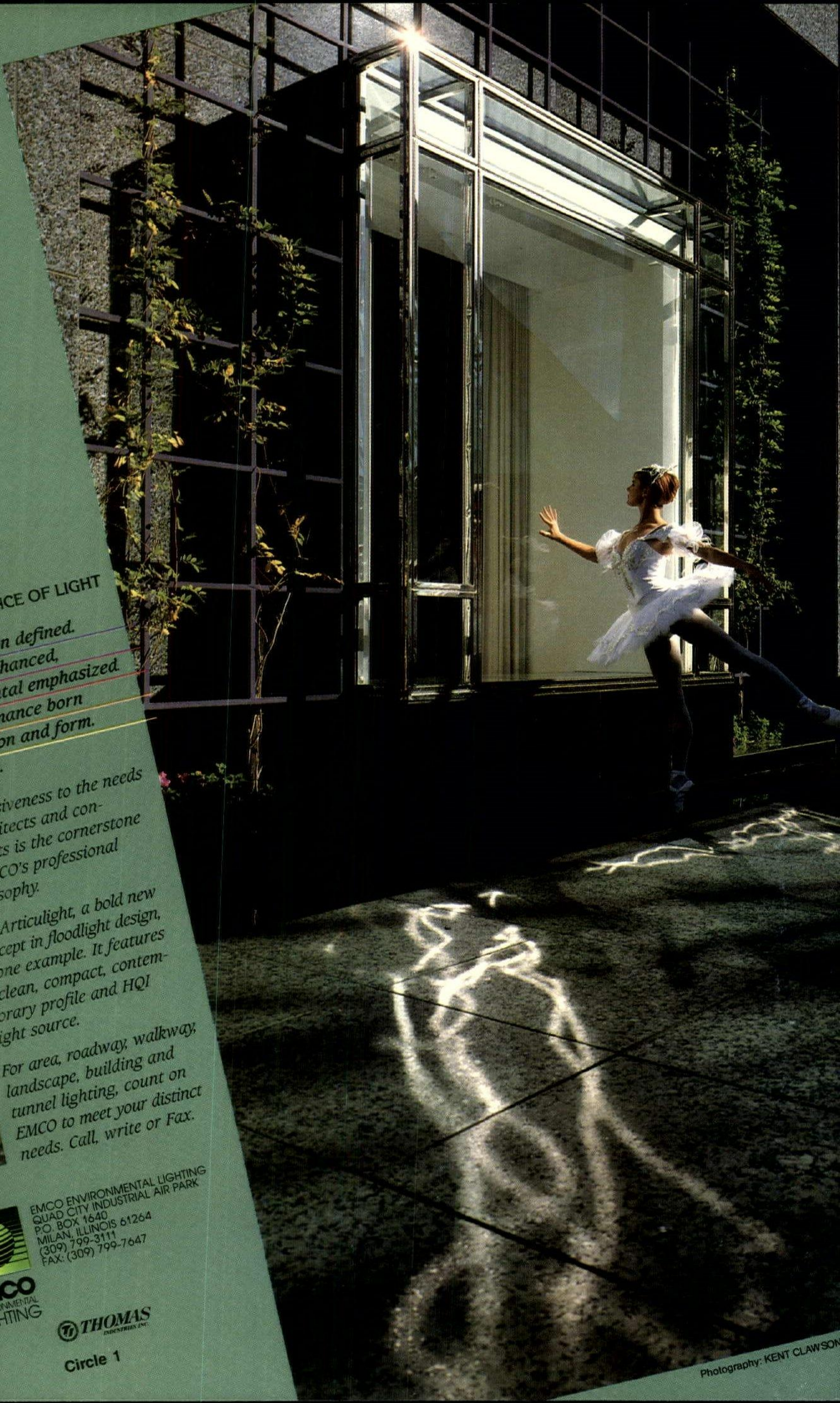

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Publisher Edward D. Aster
Associate Publisher Michael Aster

Editor Charles Linn, AIA
Associate Editor M. Jane Ganter
Senior Assistant Editor Gareth Fenley
Assistant Editor Susan Degen
Editorial Assistant Mike Heffley

Art Director Lee Eide
Production Manager Stephen Roberts
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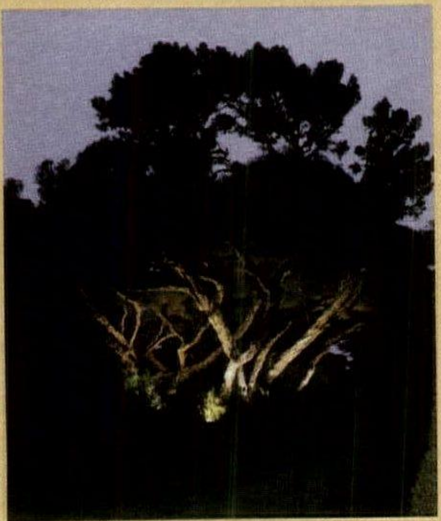

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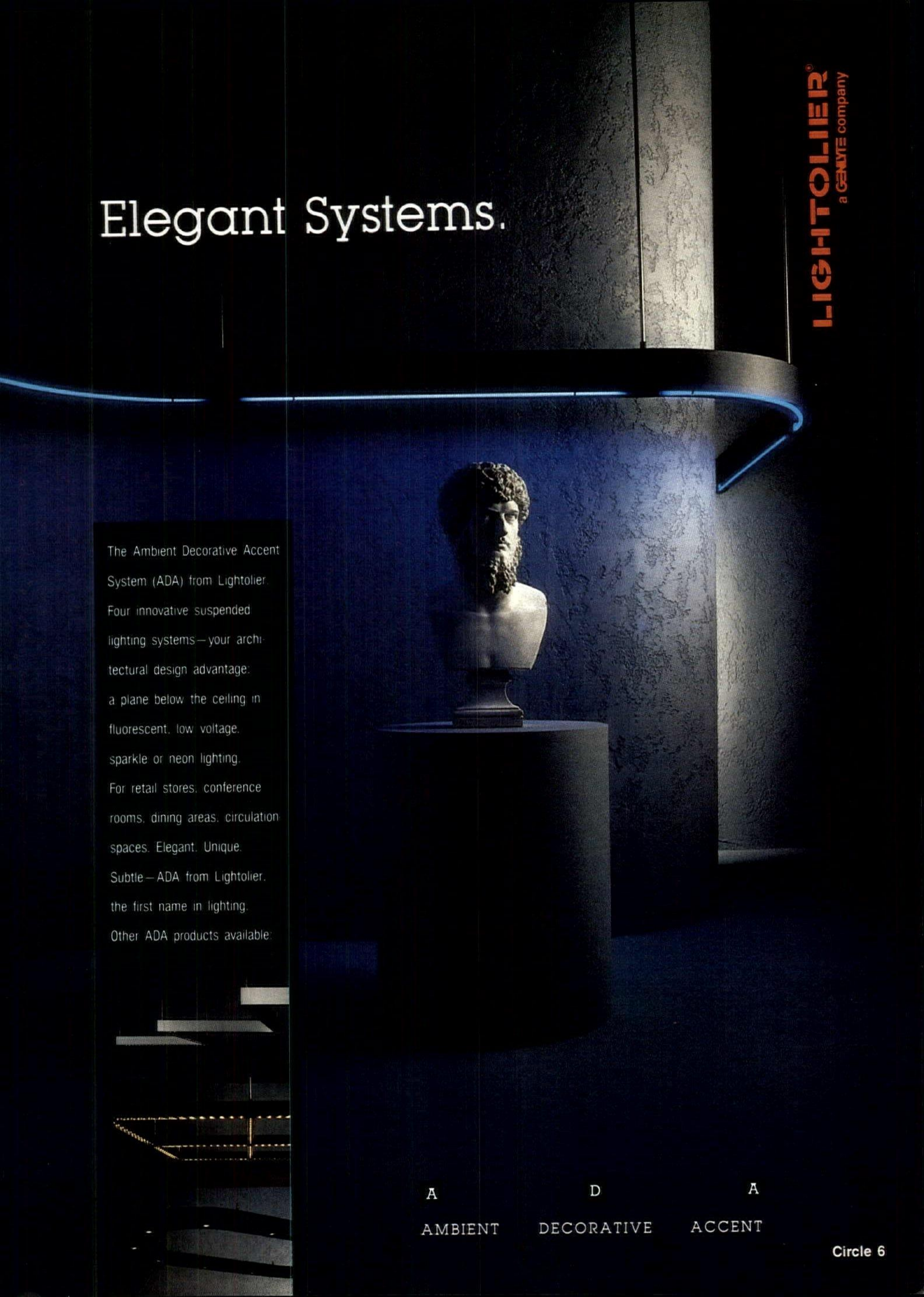
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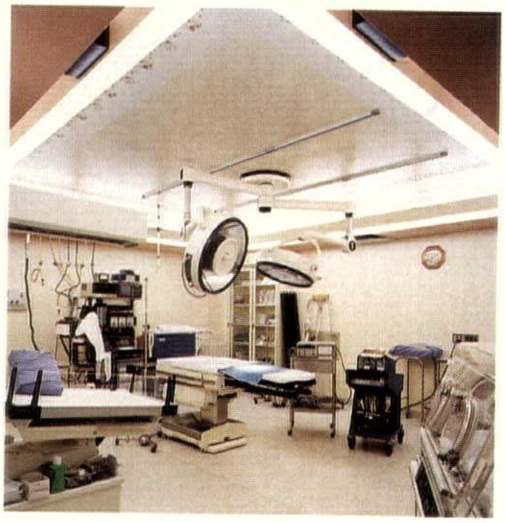

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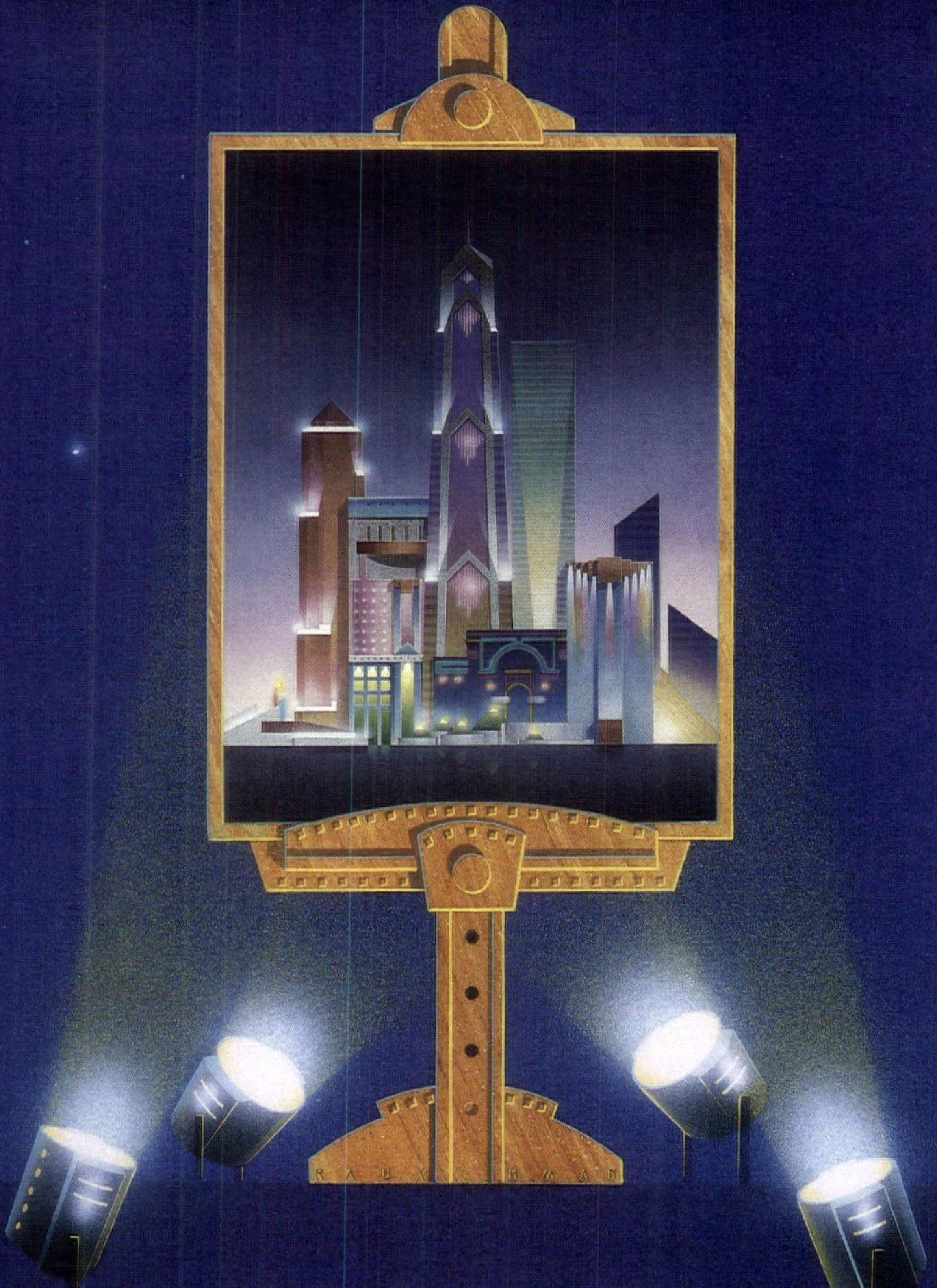


From the Editor

When I drew buildings for a living, I got used to having the capacity to make changes very quickly, while things were still on paper. If I could see that a detail didn't work or something about a design was all wrong, it got changed. Drawing buildings is pretty serious stuff, after all. If something is inadequate or incomplete, the users have to suffer with it until they move somewhere else or they get wise and remodel, if they can. Usually, though not always, there is enough time to make things right before any concrete is poured.

Magazine editing is very different. Deadlines come very quickly, and there are a lot of them. I am more obsessed with making everything perfect the first time than I ever was when I drew buildings — especially since the possibilities for humiliation abound for a person in my position. Fifty-seven thousand of my peers have a chance to redline the work my staff and I are doing every month, not to mention those undocumented hundreds of thousands who get the magazine passed on to them by the person at the next desk or see it in the library.

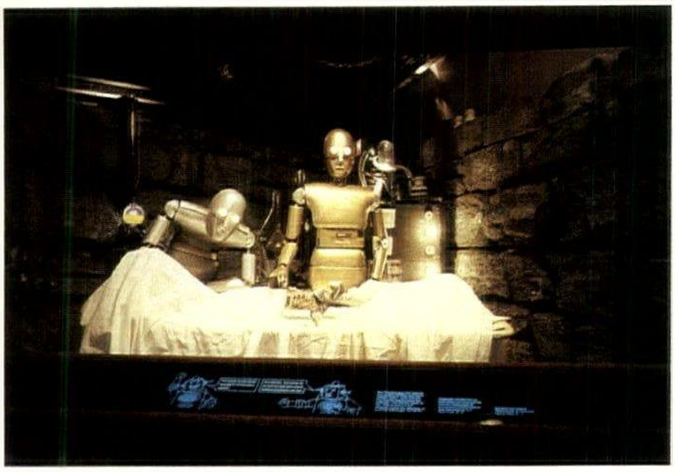
But what's really striking is that — even though it would seem I have 12 opportunities a year to make the magazine perfect — I don't get some things changed as quickly as I know they should be. Why? Well, let's compare getting material for the magazine to, say, specifying light fixtures for a building. We can't get *anything* out of a catalog. Virtually everything that goes into this magazine is a special, custom order. Deciding that something is lacking is easy. Finding the right person to *craft* it for us isn't easy at all.

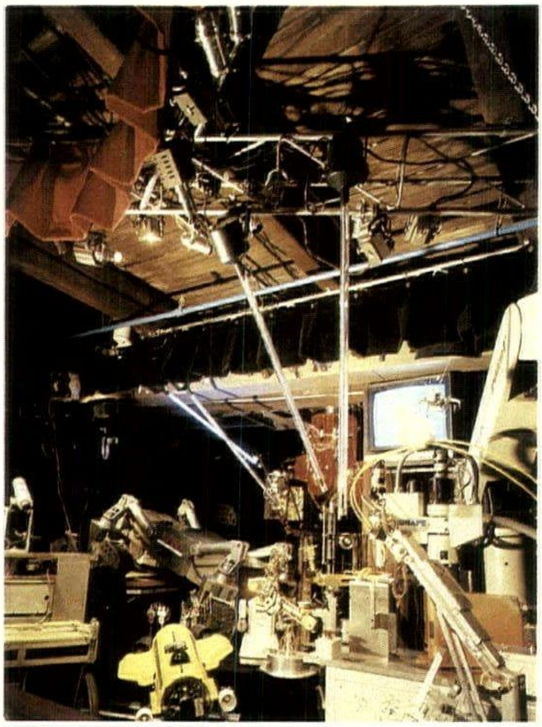
This is our 25th issue. And I am happy to announce that I have finally found the right person to craft something that I've been trying to get into *Architectural Lighting* for more than two and a half years: the perfect landscape lighting column. Jan Lennox Moyer's column starts this month. It promises to be comprehensive, lavishly illustrated coverage of the subject. Jan is passionate about landscape lighting, and we believe she'll teach our readers more than they *knew* they didn't know about it.

Another thing makes editing a magazine different from drawing buildings: you readers are far more forgiving than the users of a badly done building. We really appreciate the way you seem to accept our striving for perfection over the long haul. But don't think for a minute that our perception of your acceptance allows us to rest on the few laurels we have collected. In March, you may look for coverage of another area of practice we have yet to cover. That's when we'll introduce a new section of the magazine called *The Residential Lighting Forum.*

Charles Linn, AIA

Lighting, video, computer enliven smart machines





Project: Smart Machines Robot Theatre
Location: Boston, Massachusetts
Client: The Computer Museum
Lighting Designer: Alan P. Symonds, Ripman Lighting Consultants

The Smart Machines Robot Theatre is an example of what a lighting designer with a theater background and a way with electronics and computers can do in a hurry. The goal for lighting designer Alan Symonds was to construct an exhibit of historic robots for the general public. He consulted on the script for a 10-minute video presentation of the robots because he had to synchronize the lighting and motion of the display with the video narration. The challenge was to do it in a small space and on limited power, a tight budget, and a whirlwind schedule.

Symonds wanted to humanize robots for the audience. In an introductory scene outside the Theatre room, two robots pose as Dr. Frankenstein and his assistant Igor operating on a covered body. Every two minutes a dramatic scene, complete with taped sound effects, plays out: lightning flashes; a heart, visible as a light under the body's shroud, begins to beat; and instrument panels in the background come on, signaling the bringing to "life" of the modern monster.

Symonds raided his basement for spare electronic machines to serve as instrument panels and heart monitor and fitted them with A lamps and halogen reflector lamps; the heart light and other lights coming from the "body" are also halogen reflector lamps. The lightning bolt is produced by a multistrobe unit — five camera strobes on a sequential firing device. An ultraviolet-fluorescing liquid bubbling in a glass jar is uplit by a hidden UV light. Hidden track heads provide general illumination.

Once inside the Theatre, visitors push a button to start the show and sit on benches to view it on two large monitors. A time-code signal on the video disk triggers a computer program that controls all the lighting, as well as the motion of the six robots that move. Symonds programmed the computer and patched it to a control bank with 48 channels for lighting and 32 channels for events. Neon sticks go on and off in the dark to direct attention to machines and their features as the video discusses them.

In keeping with the theater format, 3-inch Fresnels and 2-inch PAR cans are on a triangular light truss that is a miniature version of the kind used in rock concerts. MR16 sources offer highly controllable low-voltage beams from fixtures — left partly visible to play up the theater look — behind a high red curtain. Explanatory blue signage panels grace the front of the stage for times when no show is on.

The robots, which were donated by various manufacturers, are mostly laboratory prototypes that represent the development stage just before the final, marketed version. One of the most striking of these is an early model of NASA's Mars rover unit. Its "eyes" are 300-watt quartz lamps that end the show with a grandiose sweep over the audience — followed by a simple blink, in tandem with a toy version of the same unit blinking its own 12-volt lamps on the video. In the spirit of E.T., the robots depart with the human connection established.

—Mike Heffley

For product information, turn to page 62 and see Manufacturers.

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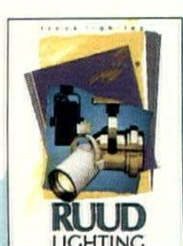

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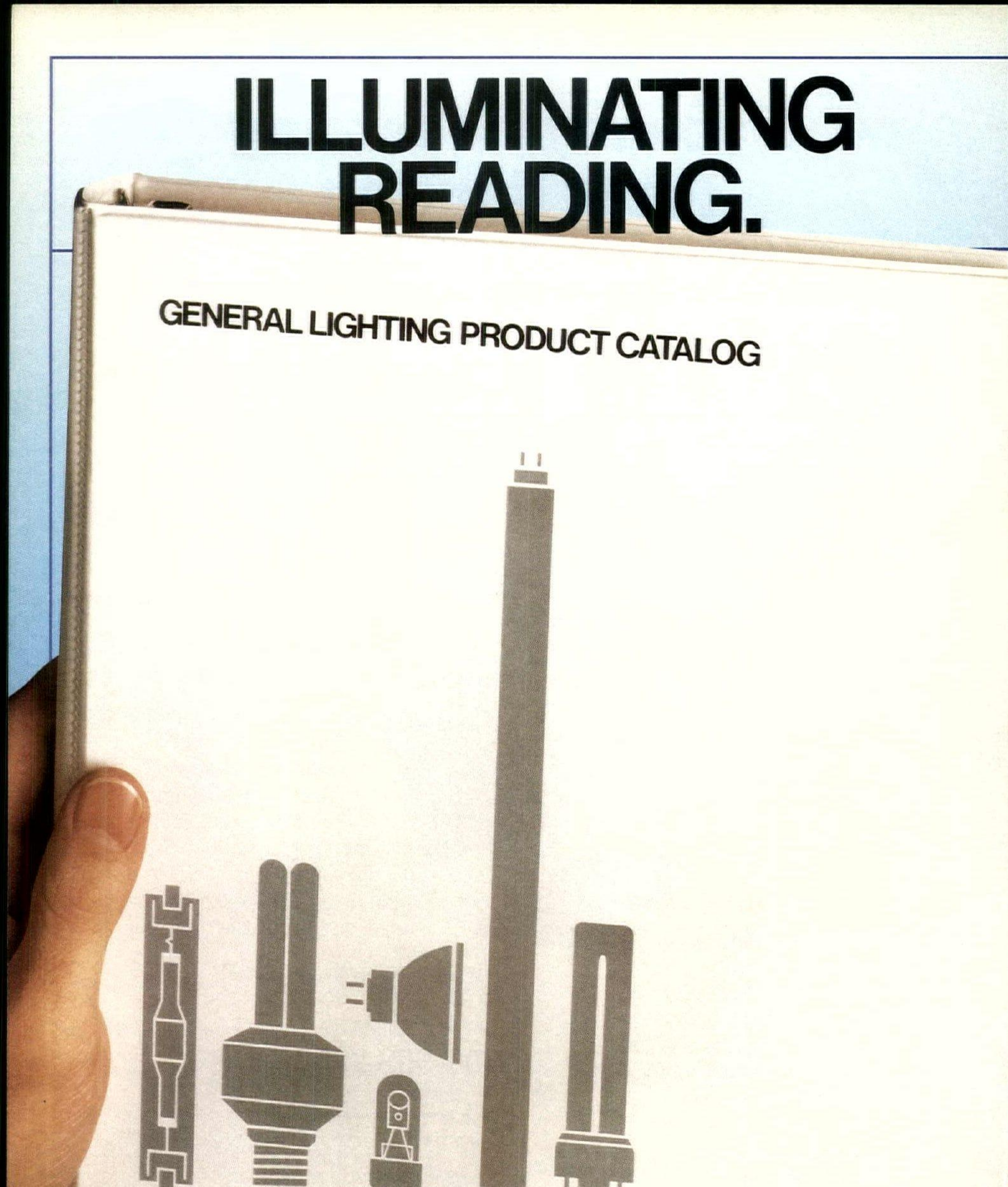
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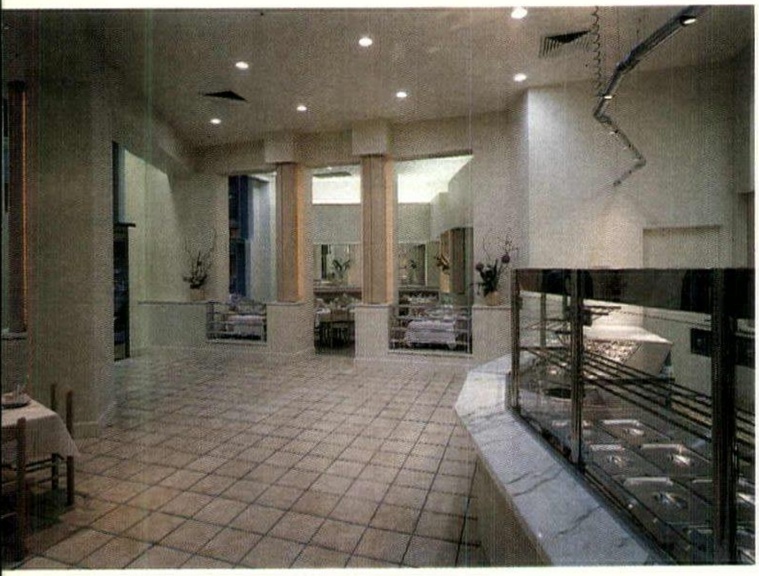
A fast food restaurant with full-service flair



Project: Yin Place III
Location: San Francisco
Architect: Jerry Lum, Dan Stebbins, and Stanley Wong, Lum Teeters Architects
Lighting Designer: Jerry Lum
Electrical Engineer: Frank Toy, Takahashi Consulting Engineers
Photos: Vittoria

Lighting for Yin Place III was designed to create an upscale atmosphere at home with the established full-service restaurants that dot the neighborhood. The quick-service dim sum restaurant, where patrons can eat their take-out lunch at well-appointed tables — or take it out — is at the street level of a new high-rise in San Francisco's financial district. The lighting design had a twofold goal: to direct patrons' attention and interest to selected areas and to reinforce the architectural forms in the space.

Two primary areas where lighting is used to attract customers' attention are the food service counter and the menu board area. To create the degree of sparkle we needed and to give the counter area visual dominance, we used MR16 spots in a suspended tube fixture over the mirror-polished stainless steel sneeze guard and polished marble counter-top. The menu board is highlighted by a baffled fluorescent fixture set into the soffit.

Other areas of visual interest are created by uplighting floral arrangements with fluorescent-lit glass shelves — some against mirrored wall surfaces, others in windowlike openings with an MR16 accent light above the arrangement — and by accenting architectural forms with perimeter fluorescents and low-voltage strip lights. These strip lights, usually used to light stair treads, create a warm glow behind the metal pilasters with their specular finish of automotive lacquer. Polished chrome sconces on the perimeter wall surfaces are lit by energy-efficient, 13-watt compact fluorescent lamps. The 15-foot-high ceilings in the seating area are uplighted with economical fluorescent strip fixtures.

The restaurant caters to a lunchtime crowd; its managers hope to serve 400 to 600 customers between 11:00 and 2:00 each weekday in a facility that seats 65 people. Promoting that kind of turnover requires a high level of ambient illumination. Yet, the facility must conform to California's energy code.

Because of the energy restrictions, we were unable to put 50 footcandles on each table as we'd hoped to do. But, the 32-watt recessed HID fixtures we selected and the specified metal halide lamps deliver 40 footcandles to table surfaces. Daylight and light-colored and specular surfaces help to increase the apparent ambient light level.

Sparkle throughout the restaurant comes from a combination of the lighting and materials used. The chrome rails, for example, are much more reflective than the more commonly used polished brass rails. Similarly, the polished stainless steel used at the service counter and the lacquered pilasters highlight those areas.

Although the restaurant is closed at night, its lighting is designed to leave an impression on passersby. With the general lighting turned off, the lighting at the menu board and behind the pilasters combines to accent the architectural form. We wanted to create a dramatic backdrop, not unlike a theatrical set.

—Jerry W. Lum

For product information, turn to page 62 and see Manufacturers.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Circle 12

Warm, subdued lighting calms hospital patients, visitors

ARTICLE BY
SUSAN DEGEN

PHOTOS BY
DENNIS MARSICO

Lighting that is comfortable for patients, visitors, and staff members is a crucial component in hospital design for today's highly competitive health care market. Empty beds mean lost revenues, so hospitals and other medical facilities are meeting the challenge by expanding outpatient services, upgrading facilities, consolidating business activities, and shedding their cold stainless steel and sterile institutional white. They are creating atmospheres that are soothing, homey, nonthreatening, inviting, and friendly — that are, in a word, humane.

Sister Joanne Marie Andiorio, president and chief executive officer of Mercy Hospital of Pittsburgh, called its lighting "cold and harsh." She said, "I want it warm and welcoming, and I do not want all those overhead lights. I want indirect lighting, and I want soft lighting."

"She is a very dynamic woman," says her assistant David Hileman, "so when she says 'I want,' that pretty well sets the style." The three main goals for the recent changes were laid out in a new facilities master plan: develop and build facilities for cardiology, rehabilitation services, emergency medicine, and admissions; improve staff and visitor circulation throughout the facility; and create a warm, welcoming, calming ambience.

Project: Mercy Hospital of Pittsburgh
Location: Pittsburgh, Pennsylvania
Architect: MacLachlan, Cornelius & Filoni; Albert L. Filoni and Clare C. Cornelius, partners in charge; Kenneth K. Lee, Richard E. Schmitz, William Szymczak, Richard A. Moninger, Ray A. Morrison, Claire Wallace Kist, John A. Duffy, Michael P. Linder, project architects and lighting designers
Electrical and Mechanical Engineer: Meucci Engineering, Inc.; Dennis Corski
General Contractor: Turner Construction Company
Lighting Contractor: Star Electric Co.

A new admissions suite occupies part of a three-story shell added to the front of the hospital. A primary design objective was to permit as much daylight as possible to penetrate the new construction and light the existing hospital lobby and interiors. A hollow metal office partition system with panels of etched and wired glass creates a forested office suite.

Lowering Light Levels

One good way to create a warm welcome and deinstitutionalize a facility is to change the lighting. The architects lowered light levels and removed as many direct overhead fluorescent fixtures as possible to create the comforting ambience that Sister Joanne Marie wanted. "Many indoor environments have too much light, particularly too much cool fluorescent light," says architect Albert L. Filoni, "so we are almost always willing to err on the other side." They used very low light levels at Mercy Hospital, particularly in the public spaces, so people will feel like they're in a residence or a hotel.

To achieve the soft, subtle lighting they wanted, the architects chose fixtures that blend into the hospital's environment without calling attention to themselves. "We use lighting to help shape our architecture," says Filoni. "That's not unlike lighting a stage set in a way; we use the lighting for dramatic effect. Some designers like to spread light out evenly over everything. We don't care about that at all. We make sure that we have light on the surfaces where people are working. Then we balance it with uplight, so they don't feel like they're in caves."

The designers' understanding of how people respond to different kinds of lighting and their balance between indirect and accent lighting were keys to the success of the lighting design. Although downlights and parabolic fluorescents with a sharp cutoff effectively prevent glare and provide task light, they can leave ceilings dark. "If you use only those kinds of fixtures, people think it's too dark and want more light. But, if you balance that downlight with a couple of wall sconces that wash the ceiling with some soft light, then the eye isn't moving from a bright place to a really dark place. Everybody feels comfortable at that point," Filoni says, adding that people feel comfortable with low light levels as long as the space does not seem dark and cavelike.

Wall sconces with compact fluorescent lamps are an attractive, cost-effective alternative to direct overhead fluorescent lighting fixtures in public areas and corridors. "Incandescent downlights and uplights are a big maintenance problem for hospitals. With 2000 or 3000 hours of lamp life and the lights kept on 24 hours a day, it doesn't take long before they're burning out all the time. The new compact fluorescent lamps are really wonderful in that regard. It's hard to tell that they're not incandescent lights. They're also very efficient. They use a lot less power, give more light, and don't have to be changed so frequently," says Filoni. The sconces also serve as part of the emergency lighting system; one of the two lamps in each fixture is wired to the emergency electrical circuit.

Public Areas

A patterned skylight and four downlights illuminate the two-story porte cochere at the hospital's main entrance. "The hospital had a very nondescript entrance," says project architect Richard Moninger. "In fact, as it was originally designed, you'd never be able to find it without signage." Cold cathode cove lights just beneath the skylight softly illuminate the mosaic murals in the porte cochere that depict the hospital's history in the community.

"We've tried using a lot of cold cathode and neon outside because it lasts so long and takes so little maintenance," says Filoni. "We use it inside places that are hard to get to where we just want a soft light. You cannot rely on it very much for functional lighting, but it helps a lot in keeping a space from seeming dark." Cold cathode tubes in the street-level display windows of the gift shop near the main entrance not only illuminate displays and reduce maintenance, but also bring the look of the porte cochere's lighting into the building.

"It was our job to take the institutional look away from the hospital," says project architect Dick Schmitz. "You walk into this place, and you think you're in a hotel sometimes." Inside the main entrance are a vestibule and elevator lobby, both softly illuminated with compact fluorescent wall sconces and cove lights. This lighting design extends through the main lobby and admissions area on the second floor and throughout the hospital's many corridors, waiting areas, and other public spaces. Strategically placed recessed incandescent downlights accent artworks and indoor plants between the elevators and a grand stairway leading to the second floor.

Continuous tiered lighting cove (above) provides proper illumination for emergency room nursing station. No downlights are used in corridors or areas where patients are moved on gurneys or stretchers. Prairie-Craftsman style stained-glass fixtures encase fluorescent tubes suspended over cashier's counters (above, far right). Typical obstetrical patient room (near right) has bidirectional fluorescent strips behind wood-trimmed valances. Decorative table lamps and other fixtures add a residential feel. Main waiting area for Mullins Bailey Cardiovascular Center (far right) has glass entrance wall that admits daylight from exterior windows in the bypass corridor. At night, vaulted cove-lit ceilings and compact fluorescent wall sconces illuminate the waiting room and corridor.

The admissions area is part of a three-story shell added to the front of the main hospital tower. Because the space is so deep, admitting as much daylight as possible was a primary design objective. The new front has large windows that bring outside light into the space. A borrowed-light partition system of thin, hollow metal sections with etched glass panels lets daylight penetrate into the office area; downlights brighten work surfaces.

The three cashiers' stations in admissions each have a custom-designed, Craftsman-style, stained-glass suspended luminaire that holds two 3-foot fluorescent lamps. "The ceiling height there is extremely high. Rather than build some sort of screen, we decided to suspend the fixture over the area and help to close it in," says Moninger. "The detailing is taken from the hollow metal system in the rest of admissions."

Some hospital units operate on an eight-hour day, while others, such as obstetrics, are in continuous operation. So that people can go around units rather than through them to reach other wings of the hospital, renovated floors have bypass corridors. Consideration for patient comfort is evident in all corridor lighting — ceiling coves at intersections and doorways, wall sconces along halls, and exterior window-wall partitions for daylighting in

bypass corridors. Continuous, tiered fluorescent coves at nurses stations illuminate task surfaces but keep light out of patients' eyes.

"We pay a lot of attention to the fact that people in a hospital are lying down a lot, and they're moved around a lot in that position," says Filoni. "We try to position the lighting so that it doesn't shine right in their eyes as they move down a corridor or move out of a room into an elevator. We try to put ourselves into these things and just say, 'That's not going to work. When they move that person into that operating room, all those lights are going to shine in her face.'"

Waiting Areas

The main waiting room in the Mullins Bailey Cardiovascular Center demonstrates the integration of public and circulation areas in the hospital. In the corridor, a vaulted ceiling with lighted coves marks the entrance to the Center. "We extended the vaulted ceilings into the waiting room, so it brings the inside and outside together," says architect Kenneth Lee. "The idea is to create relief in the ceiling so it's not a long, continuous lay-in ceiling. We painted the ceilings a light color to reflect more light." Interior glass walls let daylight from the bypass corridor brighten both the waiting area and the patient care unit, where fire-rated partitions of glass block and obscured and clear wire glass allow patients to enjoy daylight without sacrificing their privacy.

Waiting rooms in renovated areas have a comfortable look with residential details such as table lamps — a sharp contrast to waiting rooms of the past. "My father was in a hospital," says Filoni. "In the lounge that accompanied the critical care unit you couldn't put the lights out. You stay in those lounges sometimes 24 hours a day. When night comes and you want to go to sleep and you have six 2-by-4 fluorescent fixtures bright on the ceiling, it's impossible," he says.

Patient and Procedure Rooms

The Family Maternity Center on the hospital's fifth floor contains several labor-deliver-recovery (LDR) rooms, which are like standard patient rooms but have essential delivery room equipment stored close at hand. A woman goes through labor, de-

livery, and recovery all in one room, rather than being transported from a labor room to a delivery room and then back to a recovery room. The LDR rooms are becoming increasingly popular. "We've made the rooms look like someone's bedroom, so the expectant mothers are very comfortable in there," says Schmitz.

Lighting in LDR rooms can be adjusted according to need during the birthing process. A wood-trimmed valance on the headwall conceals bidirectional warm white fluorescent strips controlled from a headboard unit; the strips can downlight for reading in bed, uplight to wash ceilings with ambient light, or provide full bidirectional lighting during delivery. A powerful ceiling-mounted exam light supplies additional light over the bed.

Furnishings that include a bedside desk lamp also add a homey touch. "Some labors and deliveries can go on for hours, and the mother may go to sleep," says Schmitz. "They'll turn off the room lights and leave the desk lamp on. It just gives it a little bit of supplemental ambient light that's more decorative than anything else. But it also is functional for the physician or nursing staff who can do charting at the desk; it gives them some task lighting right there."

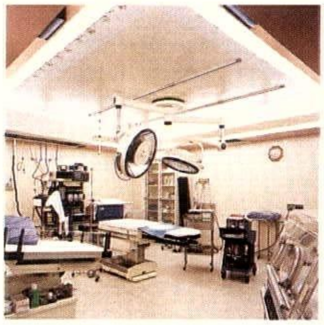
The maternity center also has high-risk labor rooms and traditional delivery-operating rooms. "In the procedure rooms themselves, where it's almost taken for granted that you should put as much light as possible, we've tried experimenting," says Filoni. "We have uplight around the perimeters and then, of course, the special surgical lighting that's required for the procedures. But when patients go into those rooms, their first impression is of a soft, warmly lit space." Since cove lighting would have collected too much dirt and dust, the architects instead used bracket-mounted bidirectional linear fluorescent fixtures on perimeter bulkheads.

Rehabilitation Center

Daylight is used as a light source whenever possible — particularly in the Rehabilitation Center for in- and outpatient hydrotherapy, physical therapy, and occupational therapy. Designed for patients' mental and physical comfort, the lighting here consists of soft, indirectly lit coves, bulkhead-mounted fluorescent uplights, and daylight. "We tried to play with the ceilings to create interest — raising and lowering them, putting in bulkheads where beam pockets need to be," says Schmitz. Away from therapy areas, where reclining patients will not be disturbed, fluorescent troffers and undercabinet fixtures light storage cabinets and counter work areas.

Light levels in the treatment areas suggest activity and vitality. "The rehab spaces either are filled with windows, which let a lot of light in, or have higher light levels so that you feel like you're going to be active now and do something," says Filoni. "A lot of the spaces have dual lighting systems so that they can be brighter or softer, depending on what people are going to do in a space." To bring as much light as possible into therapy areas, treatment spaces with window access have interior glass block walls that let light penetrate but protect patients' privacy.

Thoughtful details lessen the institutional feel of treatment areas. In the hydrotherapy area, for example, timer-controlled heat lamps help raise a patient's body temperature when hydrotherapy is over. In the occupational therapy area, a traction grid with built-in downlights is centered over a work table at which patients perform dexterity-mobility exercises. During exercise sessions, the grid supports containers of intravenous medication and slings for patients' mending limbs. In yet another treatment area, a decorative chandelier hangs

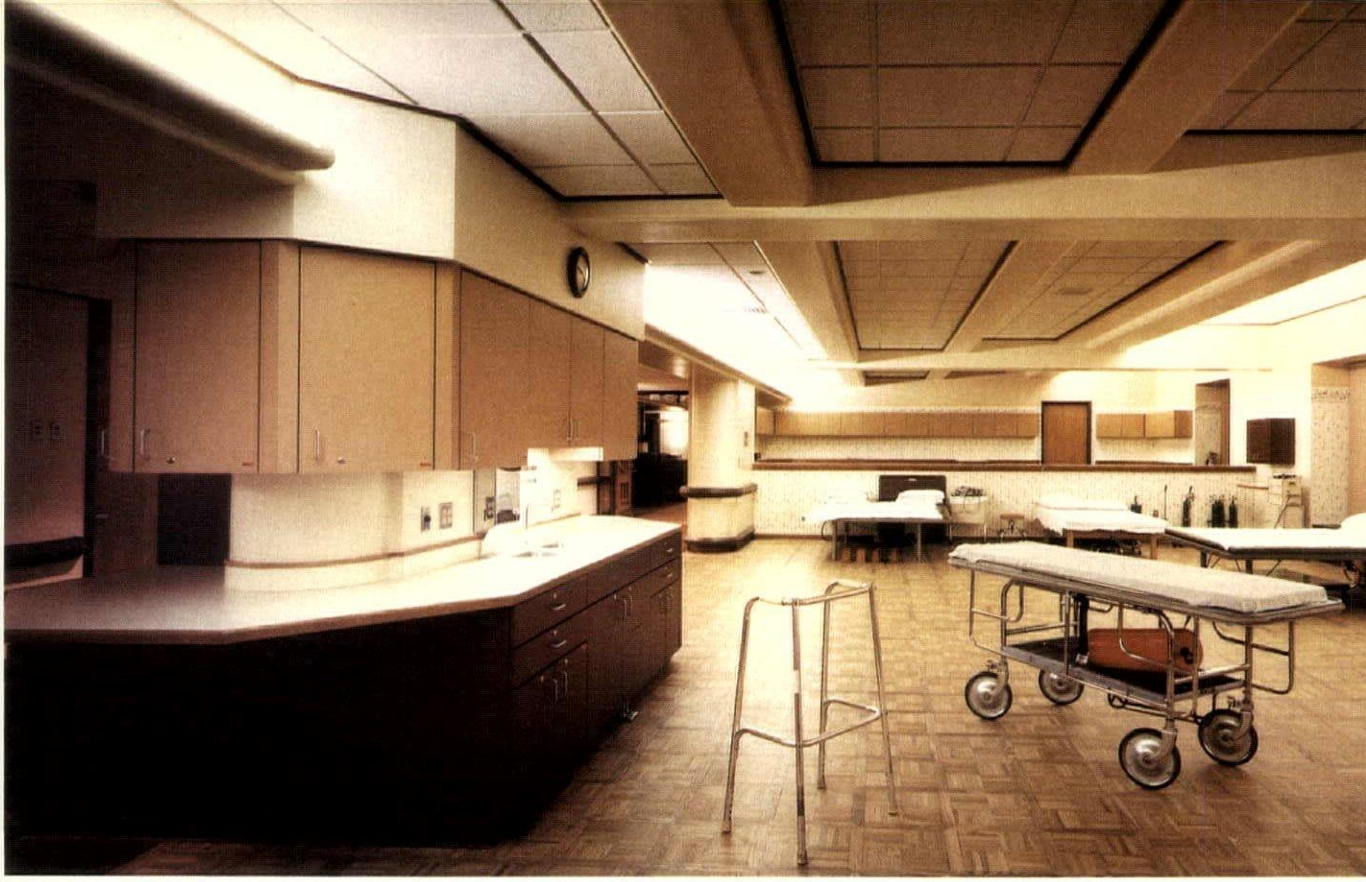


from the center of a cove-lit octagonal space surrounded by cubicles where patients receive hot- and cold-pack treatments for mobility problems.

Changes for the Better

Lighting has been the source of some of the biggest successes and failures in the hospital's renovation, according to administrative assistant Sister Maureen Halloran. "One of our big successes has been in our corridors — all those rows of wall sconces that look like incandescents but actually are fluorescents."

"Hospital people are used to thousands of lumens," says David Hileman, assistant to hospital president Sister Joanne Marie. "Hospitals tend to look like operating rooms by and large — they're white and they're bright. After the renovation, everybody was muttering and grumbling about being in the dark, saying we'd put them in a cavern. They all wanted to



In the occupational therapy area, a traction grid is used to assist patients with injured limbs. Downlights are incorporated into the grid and light the work table (far left, top). Fluorescent troffers and under-counter lights illuminate storage areas. Bulkhead-mounted fluorescent uplights provide general lighting. Delivery-operating room (far left) is comfortably and effectively lit by fluorescent light fixtures mounted on a perimeter bulkhead. Dimmable, ceiling-mounted fixtures provide special lighting for surgical procedures. Ceiling coves with fluorescent fixtures provide interest and adequate lighting to the physical therapy area (above) without disturbing reclining patients.

change and add more lights." Throughout the project, however, the architects collaborated with Mercy's supervisory staff so that changes would meet everyone's needs. After giving staff people several months to adjust to the new, lower light levels, the architects and administrative staff fine-tuned the lighting to resolve remaining problems.

Because the architects collaborated closely with Hileman during the design and construction phases of the project, few major changes have been needed. But occasionally lighting levels have been too low for staff to work comfortably. A workroom for nurses doing chart reviews, for example, was designed with built-in counter lights over work surfaces and indirect fixtures in the rest of the room. Even with task lighting, however, the room was too dark, so the architects added overhead fluorescent luminaires with parabolic louvers.

The changes in the hospital's atmosphere have been dramatic. "The lighting before was all 2-by-4 lay-in recessed fluorescent lighting," says Dick Schmitz. "Everywhere we can, and that's probably 90 percent of the areas, we've gone to indirect wall sconces, with some downlights. Carpeting in the corridors, warmer colors, vinyl wall coverings — it's made a complete change in the hospital's atmosphere. Before, with the terrazzo floors and painted walls, it was noisy. Now, with the soft lighting, the soft materials, it's incredibly different. It's quiet everywhere, especially in the patient areas."

"What's astounding," says Filoni, "is how much you can do in the hospital environment. It's an environment that affects millions, that has a lot of impact on a lot of people! We cannot take it seriously enough." ■

For product information, turn to page 62 and see Manufacturers.

1988 IALD awards presented at annual meeting

At its annual meeting and awards dinner, held in November in Washington, D.C., the International Association of Lighting Designers (IALD) announced its 1988 awards: one Award of Excellence and three citations for lighting design achievement. Awards are based on aesthetic achievement, technical merit, and sensitivity to the architectural concept.

Technically Ambitious

An Award of Excellence, the IALD's highest, went to George C. Izenour of George C. Izenour Associates Inc. (Stony Creek, Connecticut) for lighting the Benjamin Franklin Bridge. Lighting of the catenary cables and vertical suspender cables emphasizes the structure of the suspension bridge that spans the Delaware River between Camden, New Jersey, and Philadelphia.

Vertical beams of light chasing back and forth across the river give an unexpected liveliness to an otherwise static scheme. Trains crossing the bridge trigger an infrared sensor that activates the programmed animation patterns. Two computers — one for each side of the bridge — generate the animated lighting sequences, and a third operates a visual analogue that programs the lighting scheme. No light source is visible to distract drivers crossing the bridge.

Members of the 1988 IALD awards jury were Diana Balmori, Cesar Pelli & Associates (New Haven, Connecticut); Francesca Bettridge, IALD, Cline Bettridge Bernstein Lighting Design Inc. (New York City); Carol Groh, GN Associates (New York City); Steven Holl, Steven Holl Architects (New York City); Barbara Knox, Interior Design *magazine (New York City); Gene Stival, IALD, Howard Brandston Lighting Design, Inc. (New York City); and Bruce Yarnell, IALD, Yarnell & Associates, Inc. (Dallas, Texas).*

Maintenance personnel can reach almost every lighting and control component without staging or climbing. Because standardized elements have been used throughout the system, spare parts are easily and economically available. Izenour detailed the design and execution of the bridge lighting in *Architectural Lighting* (January 1988).

The awards jury called the design "a unique and technically ambitious solution to bridge lighting" and cited its "aesthetically well-resolved" use of the form of the bridge. The jury also said that the design "creates an appropriate monument" to the cities connected by the bridge.

Simplicity, Restraint

Richard Gluckman of Richard Gluckman Architects (New York City) received a citation for lighting the Dia Art Foundation's exhibition facility. The four-story, 45,000-square-foot converted warehouse in New York City has a pronounced and highly visible structural skeleton. On two floors, ambient lighting relies on a simple lighting distribution plan that uses porcelain sockets and half-frosted A lamps. Pendant-mounted track is used for direct exhibit lighting. On the top floor, stack lights provide even illumination to the exhibition walls. The electrical grid is flexible to accommodate changing exhibits and changes in long-term installations. The lighting grid and fixtures are less flexible, but can be adjusted for each new exhibit.

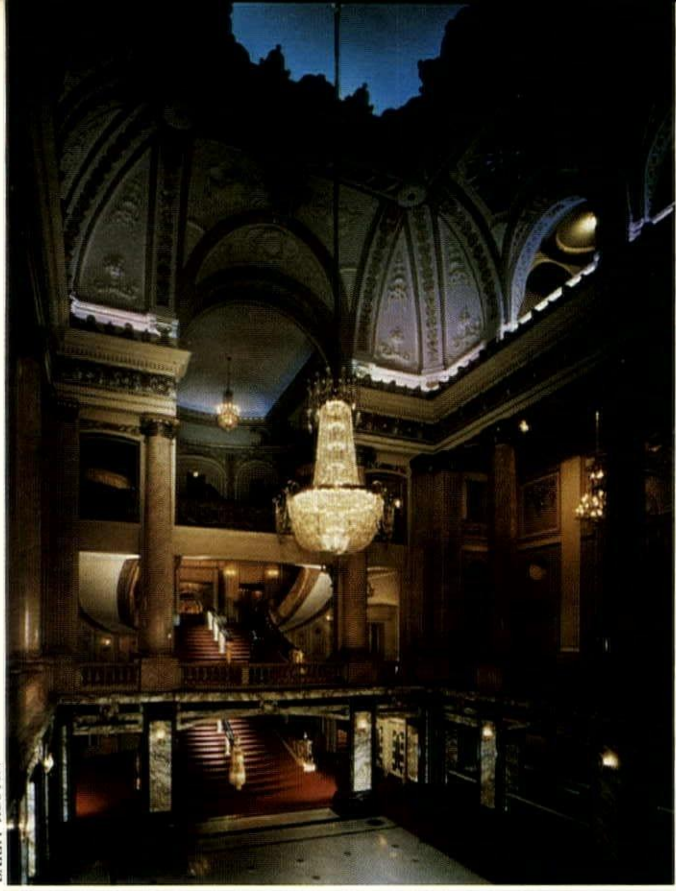
The awards jury cited the restraint used in executing the lighting, noting that "it is in keeping with the simplicity of the space itself."

Successful Balance

Daniel P. Coffey of Daniel P. Coffey & Associates, Ltd. (Chicago) received a citation for lighting the Chicago Theater, which was built in 1923. After two remodelings of its French Baroque interior, few of the original lighting fixtures remained; existing fixtures were in a 1950s style incompatible with the goals of the restoration. The design team located

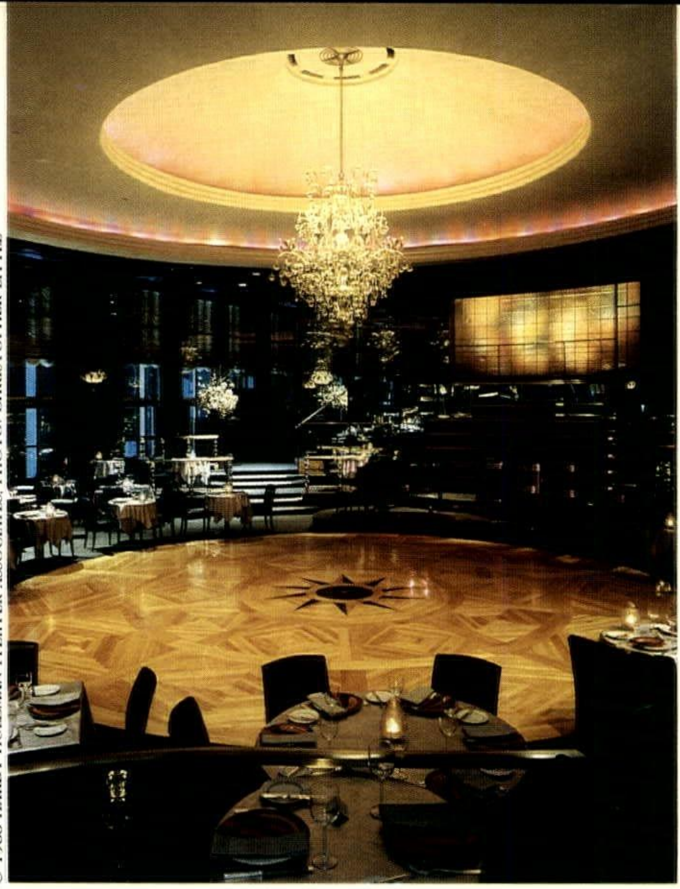
MATT WARGO

Award of Excellence winner. The lighting scheme for the Benjamin Franklin Bridge emphasizes the main catenary cables and vertical suspender cables that support the bridge deck. Computer-generated animation patterns are triggered by trains crossing the bridge.



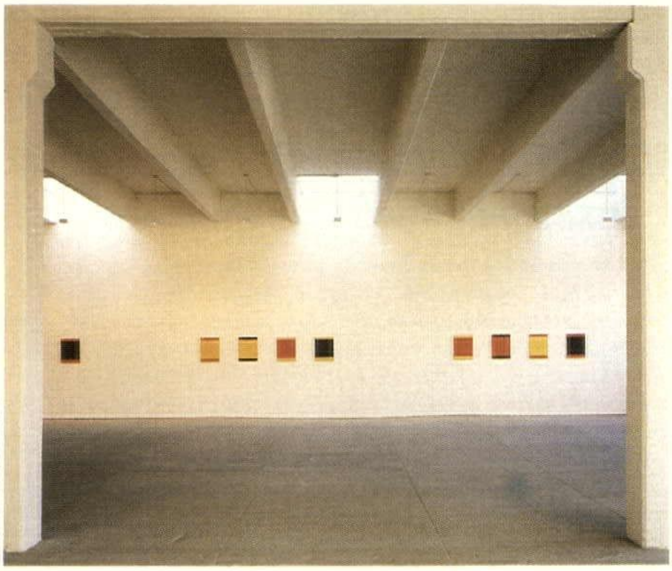
BARRY RUSTIN

The large chandelier in the grand lobby of the Chicago Theater was salvaged from a theater in Philadelphia. Original crystal beaded baskets were donated by the granddaughters of the original owners, and compatible crystal sconces and chandeliers were added.



© 1988 HARDY HOLZMAN PFEIFFER ASSOCIATES, PHOTO: CHRISTOPHER LITTLE

In the Rainbow Room proper, the only visibly new element is a cast glass wall, which is highlighted by a four-color footlit backdrop. The skyline outside is visible without distracting reflected images; lighting emphasis on horizontal surfaces minimizes reflections.



DAN CORNISH/ESTO

On the top floor of the Dia Art Foundation's art exhibition facility, stack lights supplement natural light, provide even illumination of exhibition walls, and serve as an architectural response to the structural bay.

suitable period fixtures and renovated existing original fixtures. When a false ceiling was removed in the Grande Promenade, a decorative barrel-vaulted ceiling appeared. The ceiling required repair, but the light cove needed only cleaning and relamping. Many light coves in the auditorium had been disconnected; they were also cleaned and reactivated. Lamped in red, white, and blue, the coves create dynamic lighting effects for the house; curtain warmers emphasize the plaster ornamentation and murals of the proscenium.

In voting the award, the jury said "the designer successfully matched the quality of the light with the space, achieving a balance of point source and ambient light throughout."

A 1930s Impression

Paul Marantz, IALD, Charles Stone, and E. Teal Brogden of Jules Fisher & Paul Marantz, Inc. (New York City) received a citation for the Rainbow Room complex in Rockefeller Center. The renovation project goal was to recreate remembered elegance in the ballroom, adjacent bars, dining spaces, and meeting rooms. The lighting design team's challenge was to integrate new technology into a historic context, light a great deal of art, and stay within fiscal and energy budgets. The design also had to allow for viewing of the spectacular skyline from the 64th and 65th floor complex in fine weather, yet make the interior worth a visitor's trip even when fog obscures the view. Reflected images that might distract from the view are minimized by emphasizing light on horizontal surfaces. Dimming systems with multiple presets allow for balancing the light to the level of daylight and the condition of the view.

The Rainbow Room is a landmark space, so additions to its original design required careful consideration. The previous lighting was insufficient, especially for dining and dancing. To add light and sparkle, recessed downlights supplement the chandeliers, sconces, and light organ. Niche-mounted lighting booms bring stage lighting and color to the stage area, and an expanded follow-spot closet allows a lighting operator to run a show from behind a one-way mirror.

The jury commented that the designers "successfully created the impression of spaces original to the 1930s while incorporating the most modern lighting and control techniques." ■

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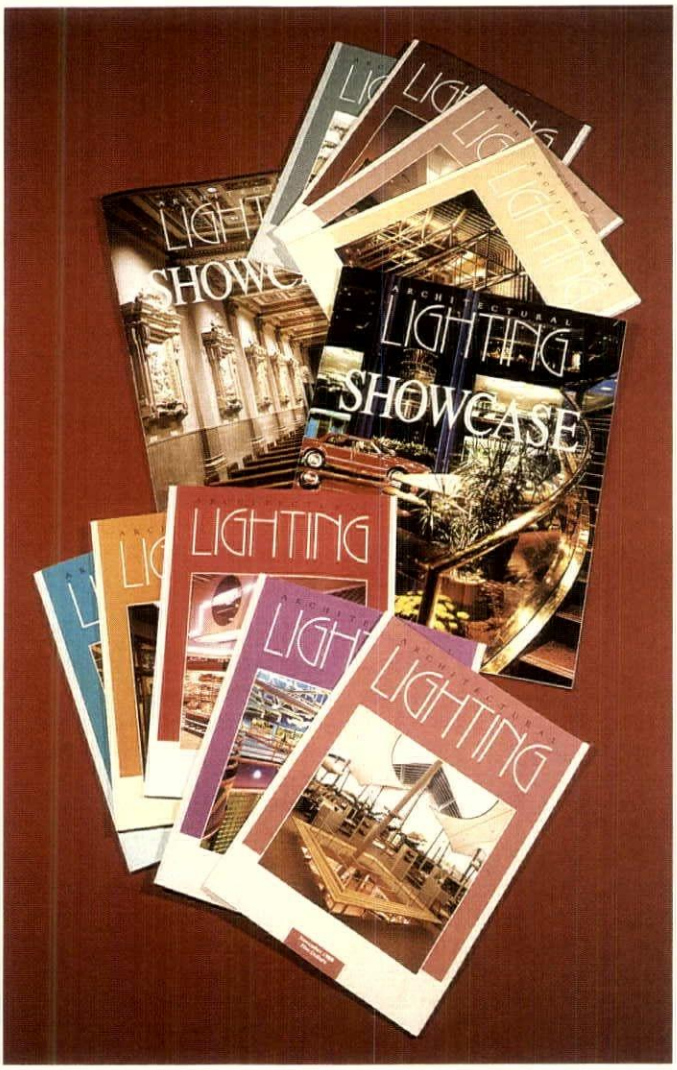

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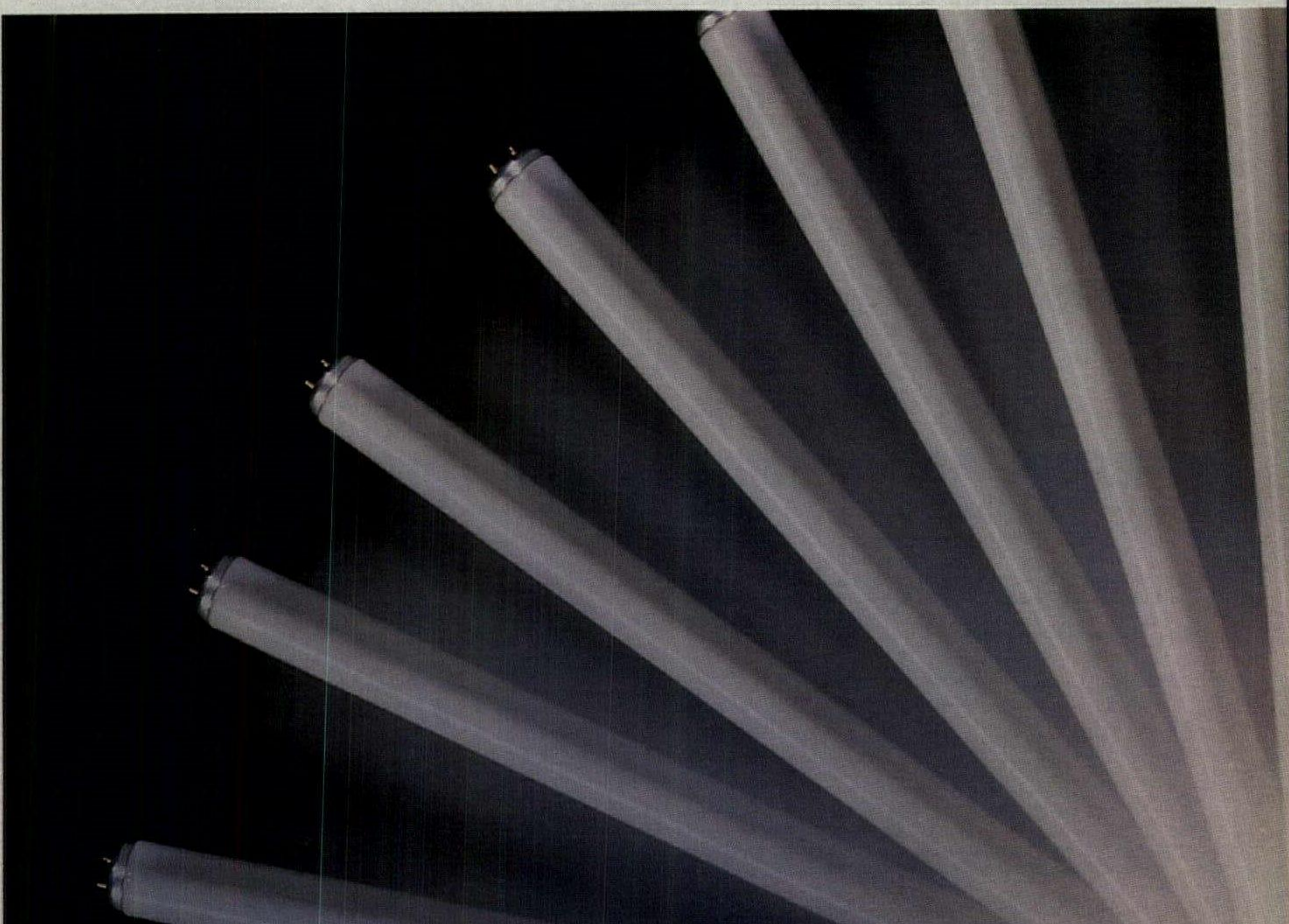

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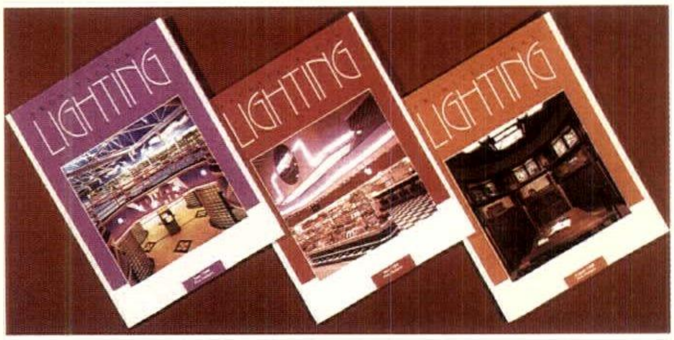

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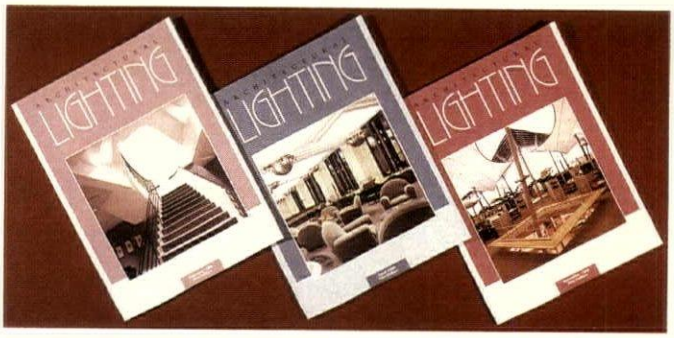

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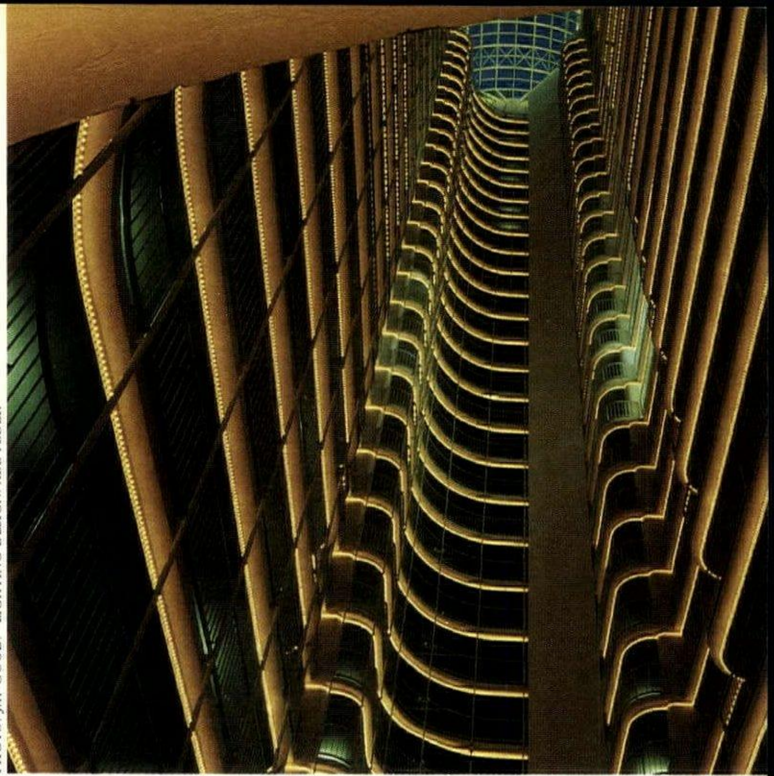


PHOTO: JAY GOOD. LIGHTING DESIGN: ABE FEDER

We'd like to see your best lighting project: How to send it

It's easy to have your project considered for publication. You don't have to be a writer, but you do need to send enough information to let us "visit" the lighting project.

We want to see creative solutions to indoor and outdoor lighting problems, everywhere and anywhere a lighting problem has been solved with creativity, practicality, and innovation. We're interested in both electrical lighting and daylighting.

To make a preliminary evaluation, we need photographs and a brief written description.

Photographs

Sharp color transparencies focused on the lighting achievement are the next best thing to giving the editorial reviewers a tour of your project. Our first choice is 4×5 color transparencies, but we also accept 2¼×2¼ transparencies and 35mm slides. We prefer to review original slides or transparencies; we cannot review color negatives.

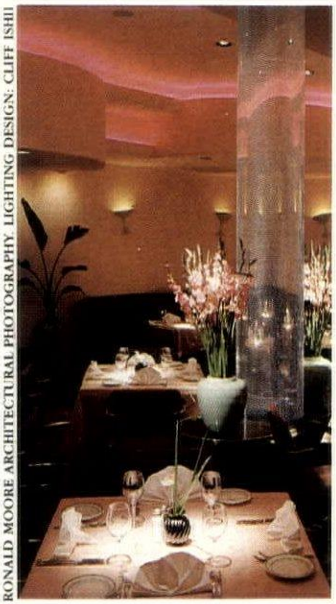
If your professional photos were originally shot as color negatives, please send full-frame prints. We prefer the following enlargements: 4×5 contact prints; 4×4 prints from 2¼×2¼ film; and 5×7 prints from 35mm film.

Be sure to provide the photographer's name and phone number, and indicate who owns publication rights. We return all photos promptly after review or publication.

Written description

Our editorial reviewers focus on information, not presentation; factual details are much more important than writing style. The best write-ups briefly describe the lighting design problem and the way it was solved, explaining the story behind what we see in the photos.

Objectives and scope. A brief statement about the effect the designer was after helps us evaluate whether and how well the objectives were fulfilled.



RONALD MOORE ARCHITECTURAL PHOTOGRAPHY. LIGHTING DESIGN: CLIFF ISHII

Philosophy. What broader, basic beliefs about what lighting should accomplish for the end user influenced your design objectives? Was the lighting solution chosen primarily for aesthetic effect? User comfort? Energy efficiency? Or for other reasons?

Calculations and planning. What did you do that might help our readers to approach their own work in some new and productive ways? Have you created or discovered a way to predict lighting results?

Light sources and luminaires. Why did you choose the particular lamps, luminaires, and/or glazing used in the project? What custom design or architectural detailing was involved?

Drawings

Drawings are optional. Include sections or details that illustrate the lighting achievement and any special luminaires, installations, or other notable features. If you send a reflected ceiling plan, please send an elevation with it.

The Review Process

Upon reaching our offices, your project submission enters our editorial review process. We send you an acknowledgment letter and circulate your submission among our reviewers. Usually, you can expect to hear from us within four weeks.

When a project is selected for publication, we usually request more information about the design team and your selection of light sources and luminaires. We may arrange a brief telephone interview to discuss design issues.

Finally, we offer contributors an opportunity to review article manuscripts so that we can correct any factual errors before publication.

Time to Publication

If the materials you submit for review are complete, and if the review and development processes are completed without any difficulties or delays, it is possible to rush a project into print in about 10 weeks. Typically, the time to publication — that is, from the time a designer submits materials for review until the published article is mailed to readers — is four to five months. If projects are complex, require additional art or photography, or are chosen to be cover stories, the total time to publication may be six to nine months.

To talk about your project or get more information, telephone our editorial offices at **(503) 343-1200.**

Send project submission materials to
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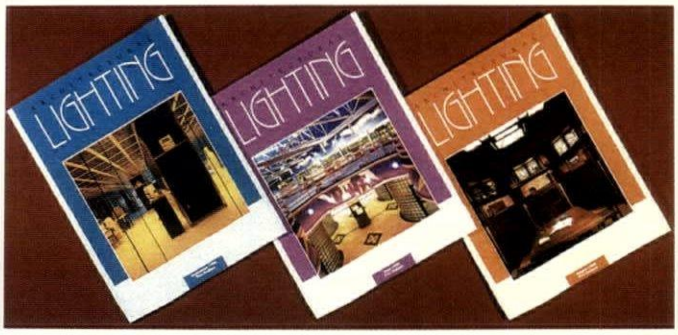

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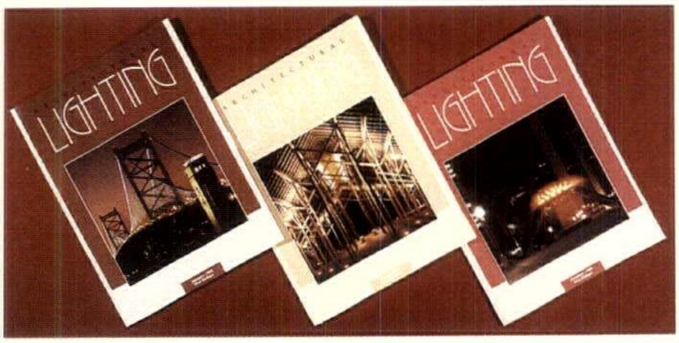

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New Olympic Oval champions daylighting. Charles Linn. February 1988, p. 26.

Stadium lighting pays off for city, sports fans. Gareth Fenley. September 1988, p. 36.

Wrigley's lighting: Great for television, but will the Cubs win a pennant? Jane Ganter. October 1988, p. 30.

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TASK-AMBIENT LIGHTING

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Lighting sets the scene for a high-tech showroom. Charles Linn. February 1988, p. 18.

"Low-voltage light sources." The Lighting Design Professional. James R. Benya. January 1988, p. 41.

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Lighting-only renovation gives training facility a new look. Jeff Brown and Gary Steffy. January 1988, p. 32. ■

Landscape Lighting

Planning for the growing and changing landscape

Janet Lennox Moyer, ASID

Jan Moyer is principal of Jan Moyer Design, Oakland, California.

This column is the first in a new series devoted to landscape lighting. It focuses on understanding plant material so that a lighting scheme can be designed to set off a new garden to best advantage — and so the lighting continues to work year-round and years later as plants change with the seasons and grow to maturity.

This long-range approach begins at the outset of a landscape lighting project, when a careful designer spends enough time studying the landscape architect's drawings of the garden layout to fully understand the design of the garden and the elements that build it. These elements may include furniture, sculpture, fountains, and pools, but most of them will be plant material.

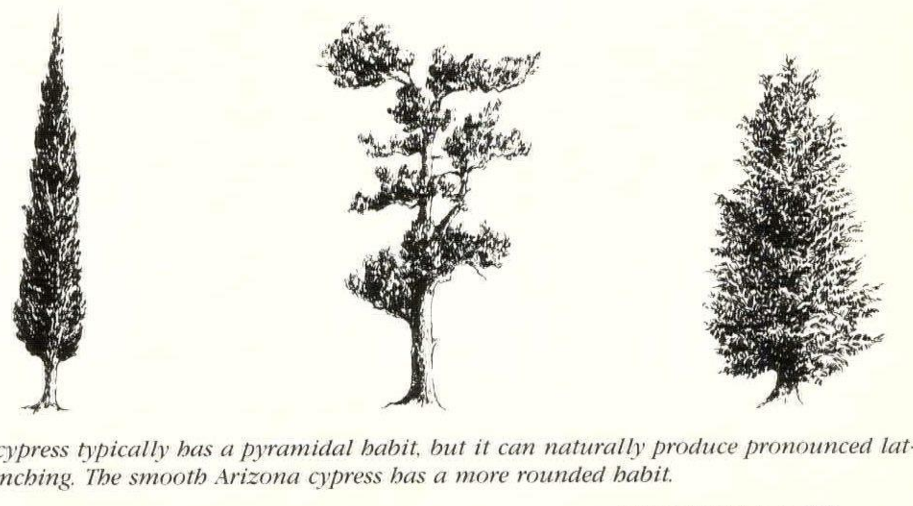
While you study the plans, your mind's eye develops an image of the landscape lighting. Effectively translating your vision into reality demands an understanding of the plant material shown on the plan. Circles designate the approximate location of specific plants that will be procured in a specific size. Although most of us can identify a birch tree when we see one, few lighting designers can claim extensive study of plant identification. Few may know that a circle labeled *Betula pendula* variety Trost's dwarf indicates a plant that looks like a laceleaf Japanese maple or that it eventually will grow to be 3 feet tall. To confound and amuse us, nature provides infinite variety in plant material. To maximize the potential of these garden elements, we need to become aware of the characteristics of the plants.

You can start gathering this information by asking the landscape architect to describe the plants. And be sure to look through plant books that have photographs of plants along with their descriptions. Gather data about all the plants in the space you plan to light; even those that will not be illuminated affect the design approach and the effectiveness of the design solution. Gather information on both the initial and mature size of a plant, its rate of growth, its climatological requirements, its overall shape, the density and shape of its foliage, the color of its leaves and flowers, and its blooming period. One or all of these characteristics can differ — from slightly to radically — among plants in the same group, or genus.

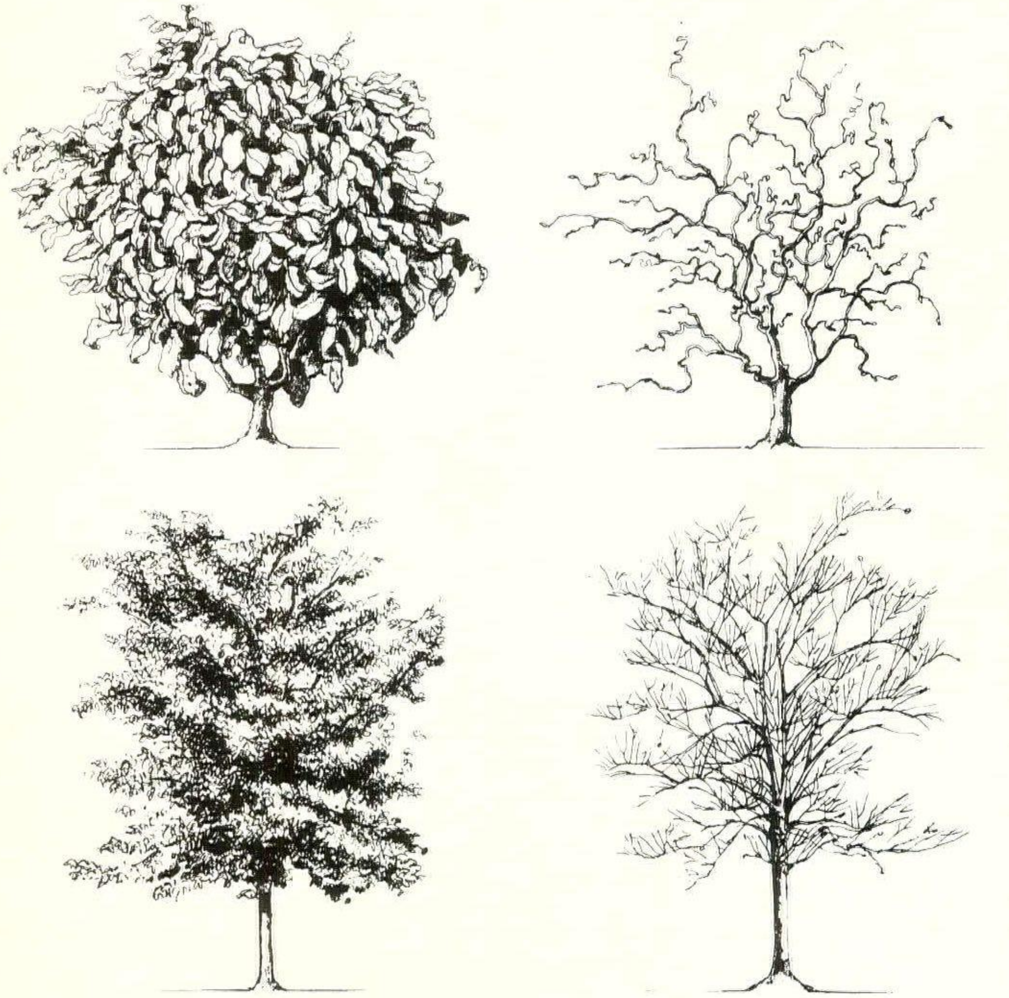
*Two mature birch trees — European white birch on the left, Trost's dwarf on the right — display no "family resemblance," though both are of the same genus and species (*Betula pendula*).*

Some variations are genetic, and some are due to geographic location, soil conditions, temperature range and variation, precipitation, horticultural conditions, and even environmental imbalances, such as smog or acid rain. For example, there are at least 45 species of common pine (genus *Pinus*), each with different characteristics. Some grow slowly — to a height of as much as 40 feet (Pinus nigra) or as little as 4 feet (Pinus mugo mugo). Some that quickly grow to a height of 100 feet in the Pacific Northwest may grow no taller than 20 feet in Southern California.

Shape variations within a plant group can catch us off guard. The Italian cypress (*Cupressus sempervirens*), for example, typically has a pyramidal habit. As the accompanying drawing shows, however, it can naturally produce pronounced lateral branching. Another cypress (*Cupressus glabra*) has a more rounded habit, with a mature height of 40 feet and width of 20 feet. Japanese

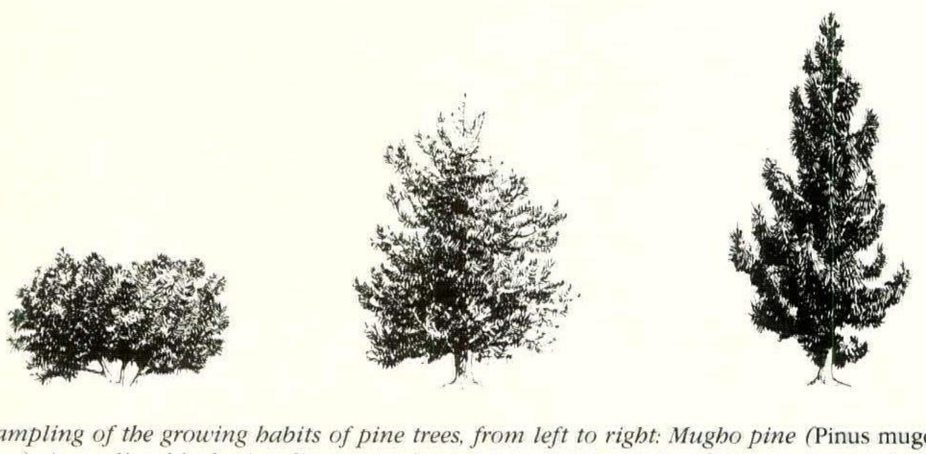


Italian cypress typically has a pyramidal habit, but it can naturally produce pronounced lateral branching. The smooth Arizona cypress has a more rounded habit.



ILLUSTRATIONS: CRAIG LATKER, MAGRANE LATKER LANDSCAPE DESIGN.

*Unlike most trees, which look best in leaf, Harry Lauder's Walking Stick (*Corylus avellana contorta*) has huge misshapen leaves that diminish its attractiveness. Its main attraction is gnarled, twisting branches, a feature that can be enhanced by lighting the tree during its dormancy.* Ribes sanguineum glutinosom, *on the other hand, is awkward and twiggy when it is dormant; therefore it may be undesirable to light it year-round.*



*A sampling of the growing habits of pine trees, from left to right: Mugho pine (*Pinus mugo mugo*), Australian black pine (*Pinus nigra*), and Canary Island pine (*Pinus canariensis*).*

maples can confound you with variations in shape. Much of the size and shape variation can be determined or controlled by pruning and shaping the plant material.

Leaves come in widely differing shapes, colors, and densities. Some magnolias and figs have thick, leathery leaves with an opaque quality; Japanese maple, dogwood, birch, hazelnut, and mulberry leaves (among others) have a translucent quality. Plants in the same genus can have leaves in many colors — yellow, pale green to dark green, pink to red, purple to nearly black. Some plants have leaves that are one color as new growth and change color as the leaf matures. Color can also be an issue with trunks. *Acer palmatum dissectum* variety Sango Kaku, for example, has a bright red trunk, as does the red twig dogwood. These leaf and trunk differences help direct the lighting approach for specific plants.

Some specimen trees that lose their leaves in winter have beautiful branching patterns, others look like a pile of sticks. A separate lighting control group for deciduous trees can provide the flexibility to vary the intensity of light on the leafless trees or to turn off the lights if the shape of the dormant tree is not pleasing. Many trees with interesting branching patterns also have interesting bark on their trunks. The bark may be mottled, striped, thorned, peeling, deeply furrowed or cracked, multicolored, and/or flaking. This may be the feature to highlight during the dormant months.

Knowing the initial size of each plant helps the designer build a three-dimensional picture of the planting composition. While developing this picture, take into account the mature size of the plant, and integrate the rate of growth and the pruning or maintenance approach planned for the garden. Understanding how quickly a plant grows and its eventual mature size helps to formulate the selection and location of lighting equipment and fixtures. An *Acer palmatum dissectum* in a five-gallon container may be 3 feet tall by 5 feet wide. Depending upon its age at acquisition, it may grow only another 6 inches to 2 feet over the next 10 years, or it may triple in size during the same time period.

The container size listed on the planting plan or on an accompanying plant list indicates the probable size of the plant upon its arrival. Any time you are unfamiliar with the probable size of a particular specimen in a five-gallon container, ask the landscape architect to give you approximate height and width with the plant description. Although container size provides a general idea of plant size, variations exist because of different growing practices and conditions. Always ask about the size of plants. When the specimen is extremely important to the lighting design or when you intend to mount accent lights in the tree, request a photograph of the chosen specimen to ensure a clear understanding of its size and shape. Asking for the caliper size of its trunk and/or branches will help to confirm the feasibility of mounting accent lights in the tree.

General garden growth presents as big a challenge to the lighting designer as any other in landscape lighting. Most people recognize the need for garden maintenance, but many do not understand the impact of plant growth on their garden lighting. As plants increase in width and height they may quickly start blocking the light; they may even totally bury a fixture that was initially out in the open. This situation needs to be fully addressed with clients and landscape architects in the initial planning stages of landscape lighting.

Everyone involved in a landscape lighting project must understand the need for a maintenance schedule that includes pruning plant material to avoid interference with lighting equipment and to enable maintenance of the lighting equipment itself. Sometimes, entire plants may need to be removed because of their interference. The location of plants needs to be carefully considered in the planning stages, and the approach to interference must be agreed upon by the design team and the client and then clearly explained to the maintenance staff. ■

Trees with interesting trunk characteristics

Characteristic	Common name	Botanical name
Thorned	*	*Chorisis speciosa*
Striped or patterned	David's maple	*Acer davidii*
	Franklin tree	*Franklinia alatamaba*
	Mountain silver bell	*Halesia monticola*
	Amur chokecherry	*Prunus maackii*
	Birchbark cherry	*Prunus serrula*
	Japanese tree lilac	*Syringia reticulata*
	*	*Betula ermanii*
Mottled	Chinese quince	*Chaenomeles sinensis*
	Korean stewartia	*Stewartia koreana*
	Tall stewartia	*Stewartia monadelpha*
	Japanese stewartia	*Stewartia pseudocamellia*
	Persian parrotia	*Parrotia persica*
	London plane	*Platanus x hispanica*
Peeling	Paperbark maple	*Acer griseum*
	Sinesis	*Betula albo*
	Yellow birch	*Betula lutea*
	River birch	*Betula nigra*
	Paperbark birch	*Betula papyrifera*
	*	*Carya laciniosa*
	Shagbark hickory	*Carya ovata*
	Japanese cornel dogwood	*Cornus officinalus*
	Green hawthorn	*Cratagus viridus*
	Amur maackia	*Maackia amurensis*
	American hop hornbeam	*Ostrya virginiana*
Furrowed or cracked	Chinese tallow tree	*Sapium sebiferum*
	American smoke tree	*Cotinus obovatus*
	Three-flower maple	*Acer trifolium*
	White orchid	*Bauhinia forficata*
	Shagbark hickory	*Carya ovata*
	Turkish hazel	*Corylus colurna*
	Dove tree	*Davidia involucrata*
	Persimmon	*Diospyros virginiana*
	Hardy rubber tree	*Eucommia ulmoides*
	Blue ash	*Fraxinus quadrangulata*
	Chinese cork tree	*Phellodendron amurense*
	Swamp white oak	*Quercus bicolor*
	Shingle oak	*Quercus imbicaria*
	Bur oak	*Quercus macrocarpa*
	Cork oak	*Quercus suber*
	Scotch elm	*Ulmus glabra*
	Japanese elm	*Ulmus japonica*
	Chinese elm	*Ulmus parvifolia*
	Black locust	*Robinia pseudoacacia*

** These plants have no common name.*

The Lighting Design Professional

Lighting for healing

James R. Benya, PE, IALD

James R. Benya is senior principal and CEO of Luminae Souter, San Francisco. He is on the faculty of California College of Arts and Crafts, is active in IES and Designers Lighting Forum of Northern California, and teaches lighting design classes for the ASID, IBD, and AHLI.

One of the most important discoveries about lighting in the last few decades is that interior lighting can affect both our physiological and psychological well-being. Although most of the research is at best preliminary, some of the early observations and experiences of design professionals teach important lessons for the designer of health care facilities.

Light has specific applications for true healing. Certain skin disorders, for example, can be treated with appropriate doses of light of specific wavelengths. But these specific treatments using light constitute only a small fraction of the healing uses of lighting in medical settings.

Far greater opportunities exist in the design of health care environments. By creating comfortable, nurturing, and low-stress treatment and rehabilitation spaces, designers can contribute to a patient's positive mental attitude in an atmosphere conducive to convalescence. Lighting is a key element in designing such spaces, yet it is frequently given little consideration.

Lighting can create a positive atmosphere for convalescence.

Institutional Lighting

Although different types of health care facilities have decidedly different requirements, all expose a patient and a patient's loved ones to time spent in stressful and often unhappy situations. Unfortunately, their understandable apprehension is often exacerbated by environments that communicate sterile, uncaring messages — and lighting is no exception.

Most health care facilities are lighted with "institutional" lighting, a combination of utilitarian fluorescent fixtures and dated, uninventive lighting designs. Consider, for example, a patient bed light. Its design has not changed significantly since it was first developed more than 20 years ago. In fact, most manufacturers still offer it with a fake wood finish, a style popular in the 1960s. Several reasons stand behind this lack of progress.

Codes. Certain building codes encourage repetition and limit innovation. Some codes, for example, severely restrict the projection of wall fixtures into a corridor, practically prohibiting wall sconces. The same codes allow door hardware to project more than twice as far.

Design standards. Design standards for hospitals have centered on designing these facilities as a series of *systems.* They encourage the proliferation of low-cost, high-efficiency fluorescent troffers and similar functional lighting.

Engineers. Lighting "design," if even considered, is left to electrical engineers, most of whom have little or no training in aesthetics. Too often, this leads to decisions based solely on energy and economics.

Lack of expertise. The role of lighting consultants has seldom been recognized in health care design. In the rare instance in which lighting is considered an important part of the architecture or interior design, it is usually left to an architect or interior designer whose lighting expertise is weak. The result is a design that is dated, misuses contemporary equipment, or both.

Gimmicks. To compound the confusion, with increasing energy costs, the field has become polluted by charlatans selling all kinds of energy-saving gimmicks. Most of them use misinformation to sell the product, circumventing responsible professionals in the process.

The result: Virtually every doctor's office, hospital, and care facility is lighted with cheap fluorescent fixtures using cool white or light white fluorescent lamps. The occasional incandescent downlight or table lamp is a trivial attempt at "design."

Lighting Issues

Health care lighting is similar to office lighting in many respects. The list of major issues to consider nonetheless includes a few unique problems.

Costs. All the costs of health care facilities have risen tremendously over the years; specialized facilities for advanced treatment are just plain expensive. Even so, more money will be needed for lighting design and equipment in proportion to previous budgets. High-quality lighting is almost always initially more expensive than institutional alternatives. The good news is that operating costs should be about the same.

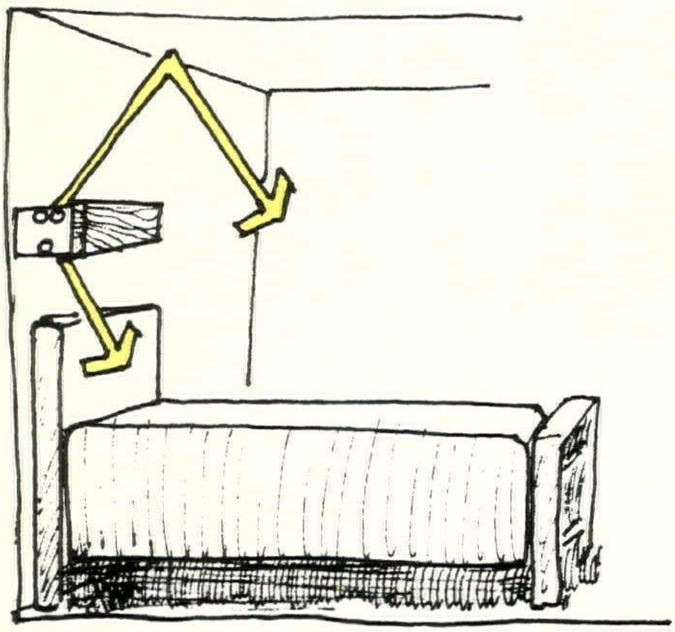
Substantial research since the 1973 energy crisis has led to new lighting products that are much less wasteful. Design practices have also changed to use fewer watts and to take advantage of the new products. Focusing on energy conservation and management, however, brings the potential for overemphasis on energy and energy costs.

Institutional lighting communicates sterile, uncaring messages.

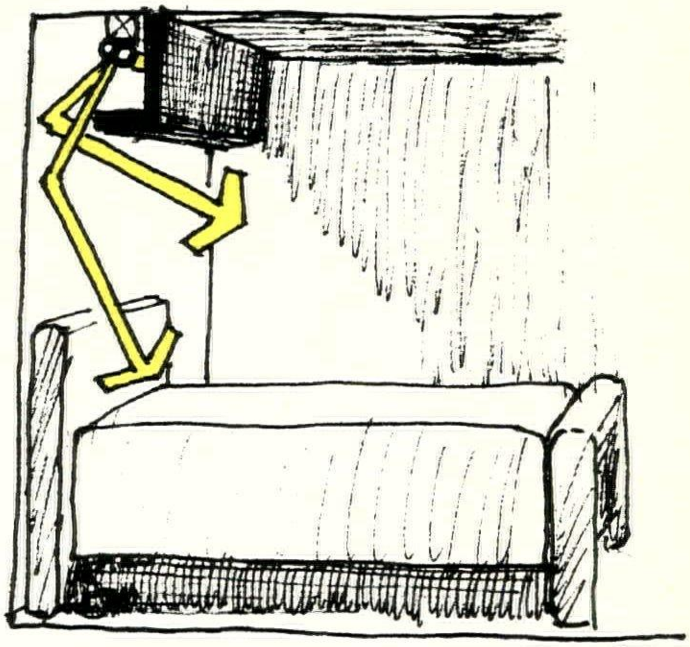
Other components of operating cost — including maintenance, cleaning, and relamping — are important considerations when choosing a lighting system. Here again, long-standing practices have popularized fluorescent lighting. As the building engineer or maintenance contractor chooses lamps, quality is often sacrificed to the lowest bid. The installer or purchaser usually has virtually no training to make a prudent decision concerning, for example, fluorescent lamp color. In addition, the savings to be gained by replacing incandescent lighting with fluorescent is very tempting, despite the fact that people seem to like incandescent lights.

Quantity of light. How much light do we really need? Because scientific research in this area began only in the 1950s, we still lack a definite answer to this question. IES supports research and publication of standards that best interpret what is known so far. The IES standards for health care facilities have been developed with the participation of doctors, nurses, technicians, and other active participants in the delivery of health care. For better or worse, the standards represent a balanced viewpoint.

The IES has created a separate,



Above-bed light provides direct reading light and indirect uplight. Light quality is good, but room appears institutional.



Soffit light conceals the source while providing indirect ambient and reading light. Room feels more residential.

not-for-profit Lighting Research Institute. Its purpose is to raise funds and in turn commission independent academic research into lighting and seeing. The extreme importance of independent research is readily apparent in such cases as "full spectrum lighting," a controversial and poorly researched field.

Germs can flourish inside fixtures.

Quality of light. Designers should be wary of any "healthy light" claims related to spectrum. The Food and Drug Administration has found no such relationships; the agency ordered the manufacturer of one popular lamp sold for its supposed health benefits, the Vitalite, to cease and desist from these claims. The research conducted by John Ott has also come under close scrutiny; his results are challenged by researchers at the Stanford Research Institute, Lawrence Berkeley Laboratories, and the University of California Medical School at San Francisco.

Practitioners should be conscious of industry standards and research. But beyond knowing the standards, the real key is interpreting them in functional and aesthetic lighting designs.

Sanitation and safety. The health care lighting designer always has to remember that lighting fixtures have the potential for being dirty places, places in which molds and germs of all kinds can flourish. Even the best sealed fixtures breathe, but open fixtures are always a source of special concern. The designer should note, however, that there is the potential for undue concern here too. An easily cleaned fixture, even if open, could be better than a sealed fixture that is never cleaned.

Lighting enhances patient safety in three major ways. First, it lights the way; good lighting is especially important to the visually impaired and the aged. Glary lighting can actually make it harder for them to see, whatever the footcandle level. Second, it provides a path for a safe exit from the building under emergency conditions. And third, it helps ensure security around building grounds, parking lots, and throughout the facility.

But lighting can also cause problems. Uncontrolled glare in a neonatal crib area, for example, hurts the unusually sensitive eyes of the infant patients. Fixtures themselves can present a safety problem, primarily where their size represents a hazard to the disabled. Glass shards from fixtures could even get into a patient's eyes if the glass breaks during an earthquake or other disaster and is not properly contained.

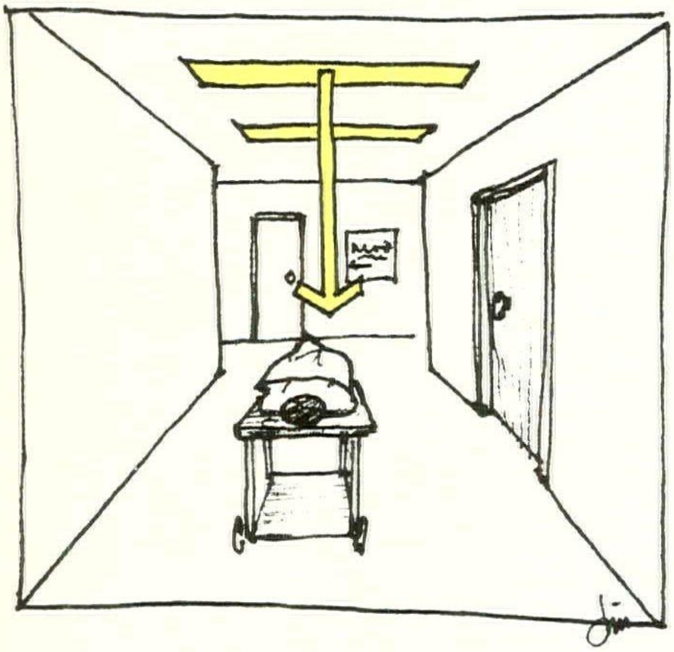
Building systems compatibility. Modern building techniques have become fairly standardized. To be cost-effective, lighting equipment must be designed to be compatible with typical systems. For example, standard ceiling systems (such as 2-by-4 lay-in or 1-by-1 concealed spline) and 277-volt power systems are used throughout most buildings, and a good lighting design takes maximum advantage of them.

The challenge to the lighting designer today is to cope with these issues without resorting to the same old, tried-and-true lighting solutions. In fact, the current "standard practice" does solve the problems of all these technical and functional issues. When subjectively assessed, though, the result is the same cold, sterile lighting design most often associated with health care lighting.

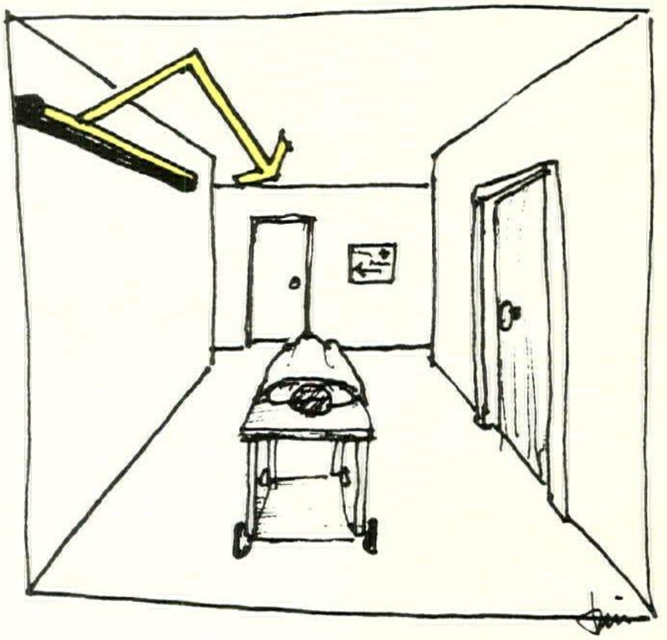
Tools and Techniques

Thanks to the growing interest in lighting design, the designer has many new options upon which to draw. Rather than risky, unproven lighting designs, most of these options involve state-of-the-art approaches and equipment currently used in offices, hotels, and residences.

Improve source color ren-



Recessed lensed fixtures are institutional in appearance and are extremely uncomfortable for patients on gurneys.



Indirect lensed fixtures provide a soft, less institutional effect and are not at all glaring to patients on gurneys.

dering. Fluorescent lamps are the most common light source in commercial and institutional facilities. The cheapest fluorescent lamps, particularly cool white, have poor color rendering properties. Warm white is also very poor, although at least somewhat friendlier. Both cool white and warm white accentuate green, yellow, and orange, and "gray out" reds in the space. The red spectrum is essential for natural and appealing color balance.

To choose a lamp, first determine whether the lamp should appear warm, cool, or in between. A lamp with a color temperature around 3000 Kelvin is considered warm; around 4100 Kelvin, cool. A popular lamp today is 3500 Kelvin, between cool and warm.

Next, check the light output needed. Most situations demand full light output lamps, or lamps that provide the same amount of light as the same-wattage cool white lamp. If you don't need full output, you can take advantage of *deluxe* lamps, which sacrifice some light quantity for superior color. A cool white deluxe lamp, for example, appears as cool as regular cool white, but its color quality eliminates the greenish tinge so much despised in cool white.

Poorly designed lighting can cause medical problems.

Finally, select the highest color rendering index (CRI) the budget allows. CRI, practically speaking, is a measure of the trueness of the lamp's color properties — 0 is the most awful and 100 is most nearly perfect. The poor fluorescent lamps commonly used, such as warm white and cool white, have CRIs of 50–60. A minimum reasonable CRI for a lamp is 70. Full-output triphosphor lamps provide 70–75 CRI in warm, cool, and in-between color temperature versions. These lamps cost about $1 to $1.50 apiece more than the cheap cool whites. The most expensive fluorescent lamps have CRIs in the 80s.

Minimize glare. Glare is a prime component of typical institutional lighting. Common, inexpensive fluorescent fixtures are particularly glary, as are other forms of cheap lighting. Designers should use alternatives to these cheap and simple solutions.

Higher quality lenses and louvers better conceal light sources. Try using more fixtures with fewer lamps in each, so each one is less bright. Also, use indirect lighting where appropriate.

Introduce daylight. Daylighting provides a psychological and, sometimes, a physiological boost to the patient. If properly controlled, it can also provide an abundance of cheap, high-quality light during a health care facility's busiest hours. Creative means of providing daylight should be part of every major construction project.

Use visual cues. Certain types of lighting fixtures are psychologically associated with certain spaces and, therefore, can remind patient or family of home, a hotel, or another less troubling environment. A hotel-style swing-arm lamp in a sleeping area, for instance, might comfort the parent of a very ill child more than the typical fluorescent over-the-bed light.

Examine every design critically and ask, "Is this approach institutional?" Whenever the basic design is likely to appear institutional, try another. For example, instead of a patient bed light, look into recessed wall washers or decorative valances.

Use softer lighting techniques, including indirect lighting, wall washing, and task-ambient lighting. Avoid harsh techniques, particularly general fluorescent lighting, in public and patient care areas. It is all right to use this type of lighting in labs, sterile environments, and other work areas.

Emphasize residential effects. Consider using sources with lower color temperatures, such

What to expect

Designs that improve health care lighting:

☐ Improve the appearance of people and spaces.

☐ Make the facility seem warmer and friendlier.

☐ Improve the image and appeal of the facility in the marketplace.

☐ Increase design costs and original equipment costs.

☐ Do not significantly increase energy or maintenance costs.

as incandescent and 2700–3000 Kelvin fluorescent lamps. Pay particular attention to using fixtures that give residential cues — table lamps, floor lamps, track lights, swing-arm lamps, and similar equipment. Much of this equipment can use compact fluorescent lamps, by the way, without losing the residential feel.

Use controls better. Too much health care lighting is uncontrolled or simply switched on and off. Consider dimming in many situations, for it not only saves energy, but it can be used to alter the mood and tension of the space.

Initially, improved health care lighting costs more than typical institutional lighting. Additional design costs, primarily due to adding consultants to the conventional architect-engineer-interior team, will add 5 to 10 cents per square foot. Based on 1988 costs, increased equipment costs could add 50 cents to $1 per square foot. Because these costs each represent about 1 percent of their respective budgets, the implications are not trivial. But, weighed against the cost of other types of architectural improvements, the overall improvement is valuable in both aesthetic and psychological terms. ■

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ARCHITECTURAL LIGHTING

Lighting Graphics

The partitions and overhanging wall cabinets used in many office furniture systems create shadows that make it difficult to get effective task illumination from traditional overhead lighting. To overcome that problem, many furniture systems have lamps or shallow luminaires under the cabinets to light the work surfaces. With that approach, fewer and smaller luminaires can serve the purpose of overhead lighting, thus saving both energy and expense. It also creates a new problem.

The luminaire or light source is usually in the worst possible position to provide task illumination free of annoying reflected glare — often referred to as *hot spots* or *veiling reflections*. These reflections can significantly mask the visual task — particularly on glossy surfaces, where they can totally "white out" task visibility. In addition, many luminaires and lamps are installed with no shielding from the viewer's line of sight, creating an additional source of direct glare.

The glare problem results from the position of the luminaire or lamp relative to the viewer's eyes. The accompanying drawings demonstrate how this position determines the location of the reflected image on the work surface, and they indicate that the lamp position nearest the wall is the least troublesome. With the lamp in this position, the reflected image is also closer to the wall and farther away from the typical task area. This is generally true whether the viewer is seated or standing.

Under-cabinet task lighting can also create an uncomfortable visual environment when dark-finished wall cabinets are contrasted with the lighted wall below. Working in these conditions for even short periods of time can cause eye fatigue because the eyes must continuously readjust to different levels of brightness. To minimize this condition it's helpful to use a slightly lower wall reflectance and lighter cabinet finishes along with ambient illumination sufficient to light the vertical surfaces of the cabinets.

Under-cabinet task lighting

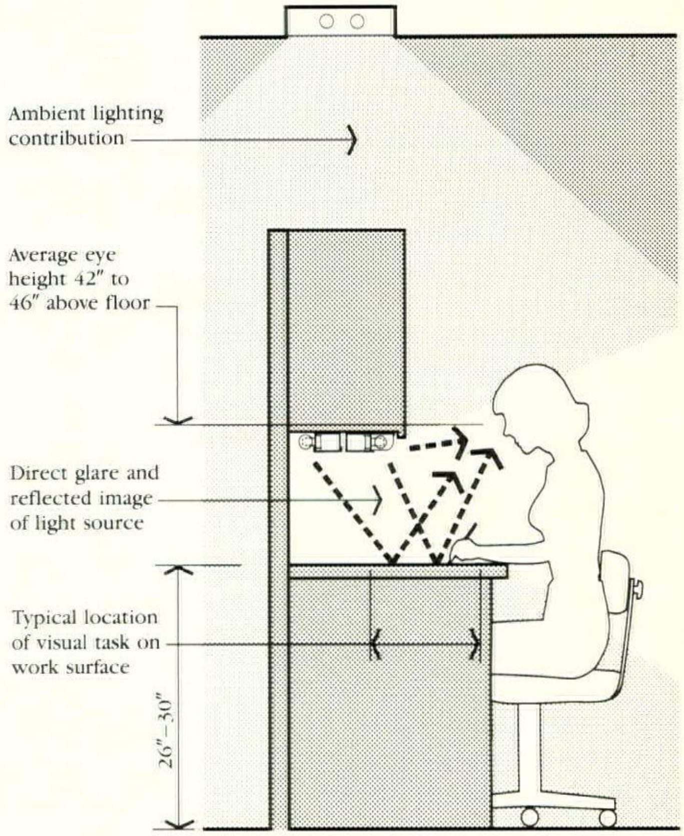
Sam Mills, AIA, IES

Sam Mills is an architect and lighting consultant with his own firm in Oklahoma City.

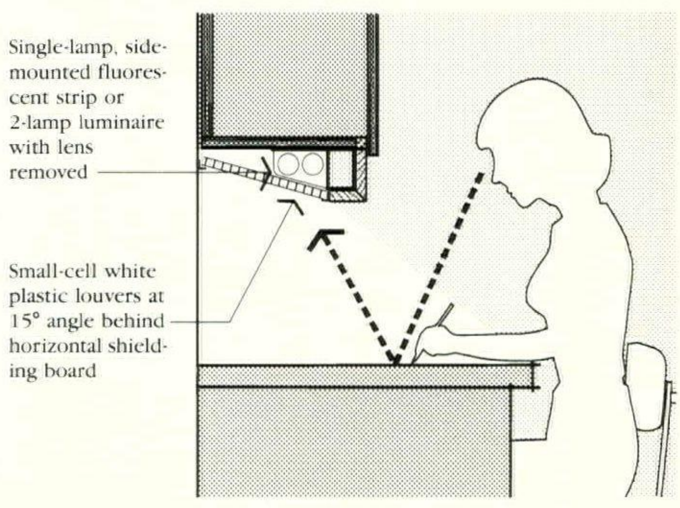
Veiling reflections can be controlled in a number of ways. One method is shown in an accompanying drawing. It uses small-cell plastic louvers to shield the lamp. Sloping the louvers at approximately 15 degrees partially screens the reflected image of the lamp while allowing light to pass through the louvers to the desk top and wall. Light reflected off the wall contributes to usable task illumination.

This technique reduces the lighting level by as much as half, but it substantially increases the visibility of the task. When higher levels are needed, using an under-cabinet luminaire with two lamps and removing the lens will make up for this loss.

A forthcoming column will look at some additional under-cabinet lighting techniques. ■

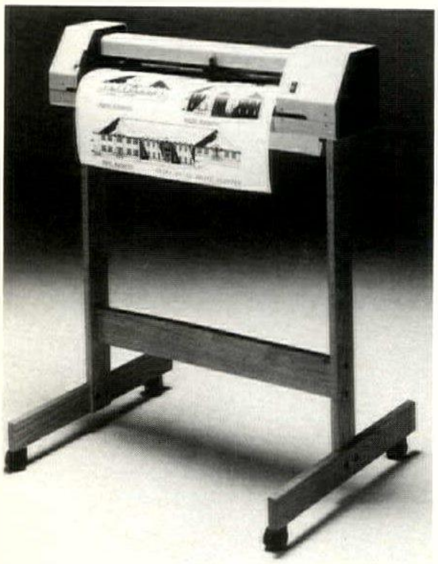


Unshielded under-cabinet task lighting can cause direct glare from the luminaire and reflected glare from an image of the light source on the visual task.



Small-cell louvers installed at an angle underneath the lamps shield the reflected lamp images, which reduces the lighting level but substantially increases task visibility.

Product Showcase



Pen plotter

Ioline's LP3500 single-pen plotter can be used with a large and growing list of CAD programs, according to the manufacturer. Users enter data through a computer utility program rather than by a conventional plotter keypad. The plotter can handle designs from $1^1/2$ inches square to nearly 2 feet wide by more than 6 feet long, on a variety of media. CAD software sensitizes the plotter to manual changes of pen size and color. Ioline Corporation, Kirkland, WA.

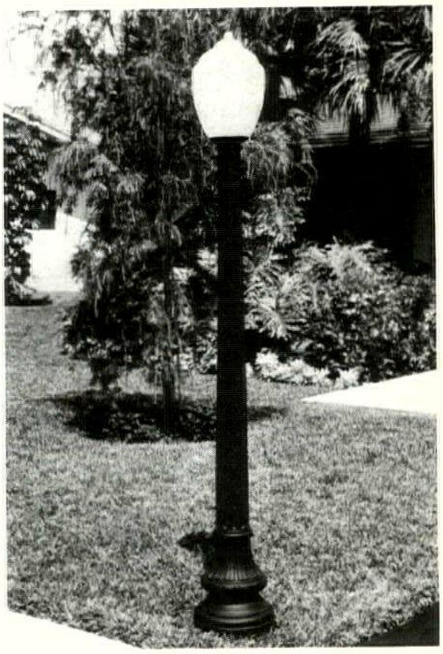
Circle 60

Recessed fixture

A recessed fixture from NL Corporation accommodates GE Lighting's 32-watt Halarc metal halide lamp. The fixture is listed as standard for damp locations, has an electronic ballast, and is available for 120- and 277-volt wiring. NL Corporation, Cleveland, OH.

Circle 61

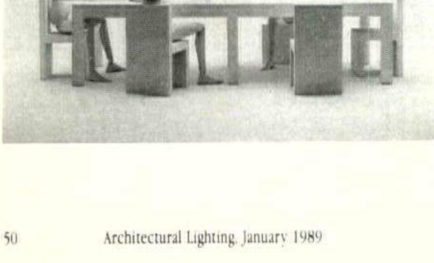
Circle 15



■ Period lamppost

The W9 is Classic Lamp Post's 7-foot polysteel Washington lamppost with a polyethylene acorn globe. The post has a double-fluted base and a tapered shaft. A 9-foot post is also available. Classic Lamp Posts, Miami, FL.

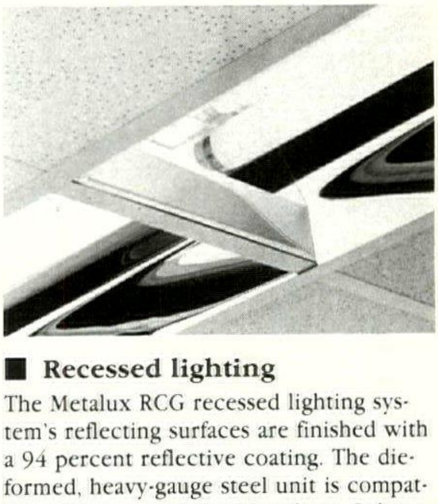
Circle 63



■ Indirect fixture

Peerless LD7 indirect fluorescent fixtures provide smooth, even light to walls and ceilings, according to the manufacturer. The extruded aluminum fixture has continuously lit lenses that are low in brightness and show no socket shadows. The fixture is designed to minimize glare on reflective surfaces and VDT screens and to keep shadows soft and diffused. Peerless Lighting Corporation, Berkeley, CA.

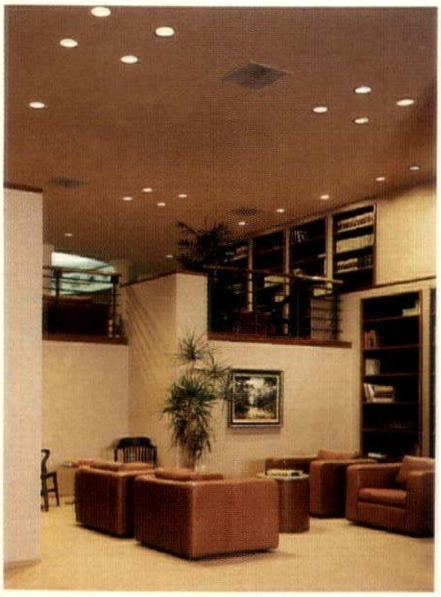
Circle 62



■ Recessed lighting

The Metalux RCG recessed lighting system's reflecting surfaces are finished with a 94 percent reflective coating. The die-formed, heavy-gauge steel unit is compatible with inverted T-grid ceilings. It has a removable wireway and ballast access panel and is available in several lengths for one or two slimline or high-output fluorescent lamps. Metalux Lighting, Americus, GA.

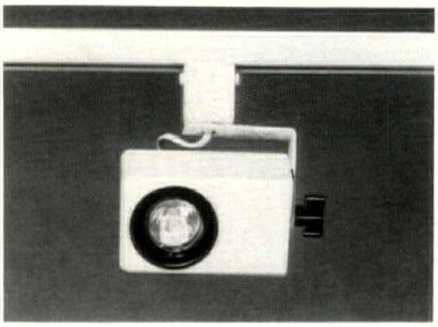
Circle 64



■ Downlight luminaires

Lithonia's Gotham Downlighting luminaires come in incandescent, fluorescent, HID, and low-voltage models with a variety of aperture sizes, beam spreads, and appearances. The high-performance, specification-grade luminaires come in lensed, pulldown, and square models with a choice of reflector systems, optional mounting devices, and sloped ceiling adapters. Lithonia Downlighting, division of Lithonia Lighting, Conyers, GA.

Circle 65



■ Halogen track fixture

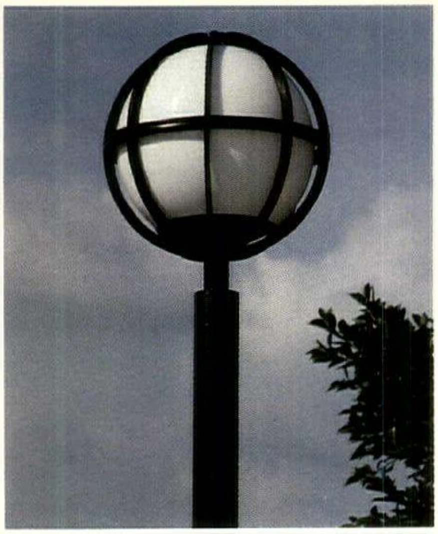
The Mity Lite low-voltage halogen track lamp from Roxter takes a 20-watt MR11 source and has an adjustable beam. A line-cord switch turns the $4^1/_2$-by-$2^1/_2$-by-2-inch fixture on and off. Available finishes are semigloss white and semigloss black. Roxter Mfg. Corp., Long Island City, NY.

Circle 66

■ Compact halogen lamps

GE's Performance Plus compact halogen PAR 20 and PAR 30 lamps are small enough to fit most existing R20 and R30 fixtures. Their precisely molded glass reflectors transmit light from a 50-watt narrow spot that has $4^1/_2$ times the candlepower of a 75-watt reflector spot but uses $^1/_3$ less energy, according to the manufacturer. Both sizes come in 120- and 130-volt versions and are designed without a diode to prevent flicker. GE Lighting, Cleveland, OH.

Circle 67



Vandal-resistant fixture

A luminaire from Architectural Area Lighting has a cast aluminum guard to protect its white or clear acrylic globe from vandalism. The luminaire accepts a 175-watt HID source and has an adapter that allows retrofitting it on existing poles. It is designed for areas of high abuse, such as playgrounds. Architectural Area Lighting, La Mirada, CA.

Circle 68

Compact arc lamps

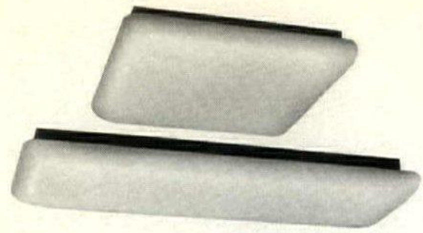
Venture Lighting's compact arc metal halide lamps are designed for better optical control of high lumen outputs than lamps with longer arcs. A standard 1000-watt metal halide lamp has an arc gap of 94 millimeters; a 1200-watt compact arc lamp's gap is 10 millimeters. Good color rendition and a 5700K color temperature make the lamps suitable for use in the theater and cinema. Standard and instant-restart versions are available. Venture Lighting International, Cleveland, OH.

Circle 69

Outdoor luminaire

Ruud Lighting's PT Series post-top outdoor luminaire is a yoke-mounted floodlight that provides symmetric quadratic light distribution suitable for roadway medians or parking lots. The compact housing is supported by a 30-inch yoke and mounting base that fits inside a 4-inch square pole or over a $2^3/_8$-inch tenon or pole. The luminaire accommodates HID sources and is UL listed for wet locations. Ruud Lighting, Racine, WI.

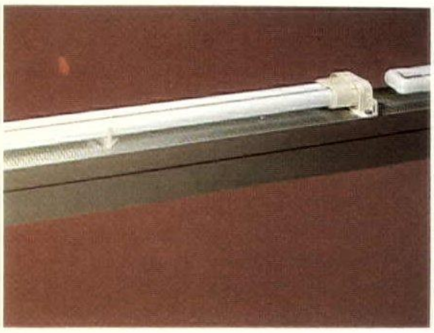
Circle 70



■ Interior luminaire

The Ellipse luminaire from LaMar Lighting is designed with a translucent white acrylic lens shaped with rounded corners for a free flow of light in interior spaces. LaMar Lighting Co., Inc., Freeport, NY.

Circle 71



■ Compact fluorescent strip

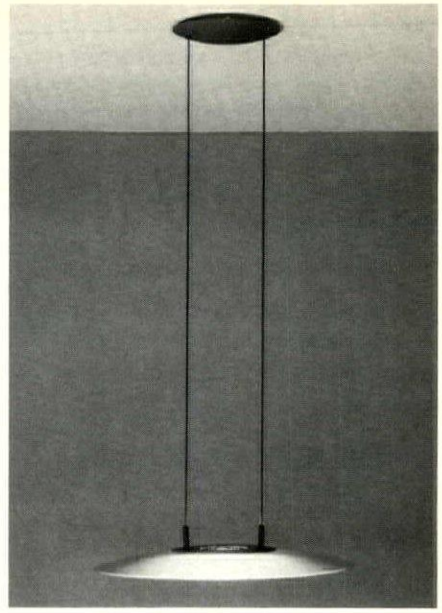
A compact fluorescent light strip from Norbert Belfer has an extruded aluminum continuous raceway in factory-mitered runs and custom lengths. The quiet self-starting ballast is housed in the raceway; lift-up sockets allow for easy relamping. Three models are available to accommodate lamps from 18 to 39 watts. Norbert Belfer Lighting, Ocean, NJ.

Circle 72

■ 400-watt floodlight

The AFL² expands the Kim Lighting AFL line of HID floodlights to include a 400-watt version. Four beam patterns are available, as are several mounting options and glare-control devices. The unit has a sealed, die-cast housing. Kim Lighting, City of Industry, CA.

Circle 73

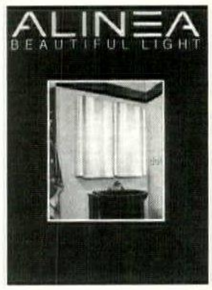


■ Ceiling pendant

The Nuvola fixture from Tech Lighting is designed to provide a soft wash of up- and downlight. Shaded glass diffuses a 300-watt source's light up, and a circular diffuser directs it down. The fixture is suspended by two cables and is suitable for spaces such as dining rooms, conference rooms, restaurants, and foyers. Tech Lighting, Chicago, IL.

Circle 74

Product Literature



Incandescent tube

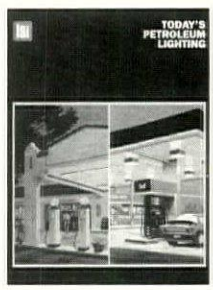
Alinea 2800K incandescent tube lights have knockouts for end-to-end mounting and operate on standard line voltage with a standard incandescent dimmer. A brochure shows available lengths and colors. Aamsco Manufacturing Inc., Jersey City, NJ.

Circle 120

Lowering units

Lowering units for ground-level maintenance of high indoor and outdoor fixtures come in three models with various options, load capacities, and safety factors. A brochure includes photos and cutaways. Lowering Systems Inc., Northbrook, IL.

Circle 121



Service area lighting

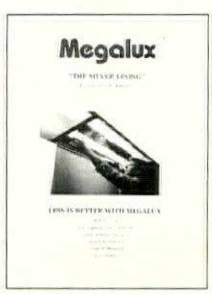
Petroleum service area lighting past and present is shown in an eight-page color brochure from LSI. Canopy-area fixtures, entrance and perimeter fixtures, and back-lit fascias are included. Lighting Systems Inc., Cincinnati, OH.

Circle 122

Specialized lighting

Times Square Lighting's 85-page catalog presents the manufacturer's full line of specialized and display lighting equipment, including track fixtures, filters, controls, and accessories. Times Square Lighting, Stony Point, NY.

Circle 123



Fluorescent reflector

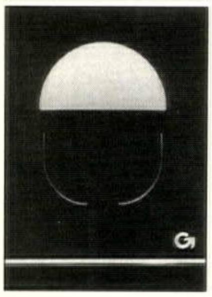
Megalux custom-made reflectors help reduce glare and cut lighting and maintenance costs, according to the manufacturer. A data sheet describes features, installation, and payback. Badger USA, Inc., Baraboo, WI.

Circle 124

Aluminum sheets

Everbrite chemically brightened, anodized aluminum sheeting is made for retrofitting fluorescent fixtures. A data sheet lists specifications, characteristics, and sample retrofit test data. Alcoa Sheet & Plate Division, Davenport, IA.

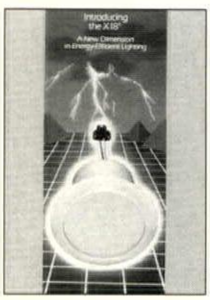
Circle 125



Exterior luminaire

The Glow Top luminaire comes in two shapes and mounting styles for post-tops, single and twin arms, and wall brackets. A brochure provides information on lamps, voltages, dimensions, and finishes. Gardco Lighting, San Leandro, CA.

Circle 126



Recessed retrofit

The X18 18-watt compact fluorescent retrofit unit fits flush into a 6-inch-diameter recessed ceiling fixture to replace a 75- or 100-watt incandescent lamp. A brochure compares energy costs. Scientific Component Systems, Anaheim, CA.

Circle 127

Infrared occupancy sensors

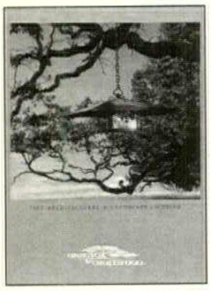
A line of passive infrared occupancy sensors comes with a daylight control built into each unit. A brochure describes wall switch, wide view, and hallway sensors. Sensor Switch, Inc., Branford, CT.

Circle 128

HPS lamp

Iwasaki's Sunlux Super Ace high pressure sodium lamp operates on existing HID ballasts, has a built-in electronic igniter, and uses less energy than standard HPS lamps. A color brochure explains features and benefits. CEW Lighting, Inc., Dallas, TX.

Circle 129



■ Landscape lighting

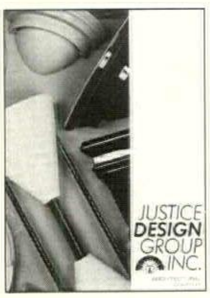
The Monterey line of solid brass outdoor lanterns features three styles inspired by early California architecture. A brochure includes color application photos of models for pendant, wall, and post mounting. Arroyo Craftsman, Arcadia, CA.

Circle 130

■ Track-mounted projector

The 1180 track fixture is an optical projector designed to light small paintings, antiques, and sculptures. A data sheet describes the fixture's yoke and adapter for new and existing installations. Wendelighting, Burbank, CA.

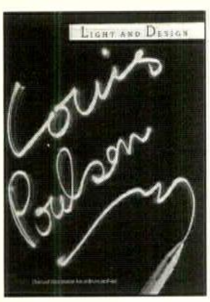
Circle 131



■ Ceramic sconces

Handcrafted ceramic sconces and pendants for fluorescent and halogen sources are available in stock and custom designs. A brochure shows fixtures in several colors and a glaze finish. Justice Design Group, Inc., Los Angeles, CA.

Circle 132



■ Indoor, outdoor lighting

Poulsen Lighting offers a variety of recessed luminaires and wall sconces for interior and exterior applications. A 15-page color brochure describes fixtures for incandescent and fluorescent sources. Poulsen Lighting, Inc., Miami, FL.

Circle 133

■ String lighting

Light Vines are low-voltage miniature lights on flexible tubing that can be shaped around geometric structures. A color data sheet describes various lamp spacings and a design for easy relamping. Sylvan Designs, Northridge, CA.

Circle 134

Calendar

January 30, 1989	**Reservation deadline** for June 1989 IES biregional conference in Cancun, Mexico. Contact: Tyra Swain, Global Enterprises, Inc., P.O. Box 1907, Austin, TX 78767, (800) 369-9025.
February 1, 1989	**Submission deadline** for IES International Illumination Design Awards, Heart of America section. Contact: Mary Robarge, IIDA Awards, 1308 Pennsylvania, Kansas City, MO 64105, (816) 842-7023.
February 5, 1989	**Entry deadline** for the 1988 Edison Award competition. Contact: Frank LaGiusa, competition chairman, GE Lighting, Nela Park, Cleveland, OH 44112, (212) 614-5011.
February 14, 1989	**All the world's a stage,** DLF event. Speaker: Steve Kennedy. Contact: Designers Lighting Forum of Northern California, P.O. Box 1429, San Francisco, CA 94101-1429, (415) 824-8310.
February 15, 1989	**Product review 1989,** DLF event. Contact: Sy Bollinger, president, the Designers Lighting Forum of New York, Inc., 58 Stratford Avenue, Greenlawn, NY 11740, (212) 255-8555.
February 20, 1989	**Heart of America IIDA program,** IES section event. Contact: Mary Robarge, IIDA Awards, 1308 Pennsylvania, Kansas City, MO 64105, (816) 842-7023.
February 23–25, 1989	**AAMA Expo '89,** Convention Center, Washington, DC. Contact: Tony Coorlim, Show Manager, AAMA, Expo '89, 2700 River Road, Des Plaines, IL 60018, (312) 699-7310.
February 24, 1989	**Application deadline** for 1989 IALD summer internships. Contact: design schools, student chapters, or IALD, 18 East 16th Street, Suite 208, New York, NY 10003, (212) 206-1281.
March 13–15, 1989	**Reflector design — Theory and practice,** seminar, Stapleton Plaza Hotel, Denver. Contact: TLA–Lighting Consultants, Inc., 72 Loring Avenue, Salem, MA 01970 (508) 745-6870.
March 14, 1989	**Kitchens and baths,** DLF event. Speakers: Al Zapparoli, Chula Camp. Contact: Designers Lighting Forum of Northern California, P.O. Box 1429, San Francisco, CA 94101-1429, (415) 824-8310. ■

Classified Directory

ACCENT AND DISPLAY LIGHTING (INTERIOR)

AMERLUX, 23 Daniel Rd., Fairfield, NJ 07006 ... 201/882-5010
BEND-A-LITE (see ad this section)
DANALITE, 16392 Gothard St. #A, Huntington Beach, CA 92647 ... FAX 714/848-1669 714/841-4325
Low voltage / slim profile linear lighting system / high intensity halogen lamps / extensive apps.
FIBERSTARS, 47456 Fremont Blvd., Fremont, CA 94538 ... 800/327-7877
MIROFLECTOR CO., 40 Bayview Ave., Inwood, Long Island, NY 11696 ... 516/371-1111
Full line of recessed accent lights, down lights & wall washers. Architectural cylinders for HQI, incandescent compact quad fluorescents and HID lamp sources.
NL CORP., 14901 Broadway, Cleveland, OH 44137 ... FAX 216/662-9069 or 216/662-2080
Recessed HID and incandescent; decorative; custom; church; 20, 30, & 60 amp track; fluorescent lighting systems. Call for more information.
SCHLESSELMAN INC., 2778 Banning Rd., Cincinnati, OH 45239 ... 513/923-1144
Designer & Manufacturer of Special & Standard lighting fixtures for the Display Industry.

ACCESSORIES AND COMPONENTS

AMERICAN LOUVER CO., Skokie, IL, Louvers and Lenses ... 800/323-4250 or 312/470-3300
LEXALITE INT. CORP., P.O. Box 498, Charlevoix, MI 49720 ... FAX 616/547-5833 or 616/547-6584
Custom and Proprietary Injection Molded Lighting Products. (For information call Cheryl Barron.)
MAXIMUM TECHNOLOGY, 60 Industrial Way, Brisbane, CA 94005 ... 415/468-2560

AMBIENT LIGHTING SYSTEMS (INTERIOR)

H.E. WILLIAMS INC., P.O. Box 837, Carthage, MO 64836 ... 417/358-4034
LITHONIA LIGHTING. We cover the lighting spectrum ... 404/922-9000
NORBERT BELFER LIGHTING MFG., Cove & Linear Lighting Products ... 201/493-2666
PEERLESS LIGHTING CORP., P.O. Box 2556, Berkeley, CA 94702 ... 415/845-2760

AREA LIGHTING (EXTERIOR)

ADJUSTA-POST MFG. CO., P.O. Box 71, Norton, Ohio 44203 ... FAX 216/745-9746 800/321-2132
Residential & commercial outdoor fixtures. Stds. & Acces., HID, fluorescent, low volt. & incandescent.
AMERICAN ELECTRIC, 1555 Lynnfield Rd., Memphis, TN 38119 ... 901/682-7766
HID luminaires for area, facade, roadway, sports, and industrial lighting applications.
C.P.I. CONCRETE PRODUCTS, P.O. Box 13324, Memphis, TN 38113 ... FAX 901/775-9883 or 901/775-9880
Concrete light poles & bollards. Fourteen decorative colors & exposed aggregate finishes such as dark bronze, black, & granite to match any setting. Square tapered design up to 65 ft.
ELA CO., 17891 Arenth Ave., City of Industry, CA 91748 ... 818/965-0821 FAX 818/965-9494
Mfgs. of decorative outdoor fixtures, poles and arms for the commercial and residential mkts. Custom designing and mfg. of decorative interior/exterior fixtures.
EMCO ENVIRONMENTAL LIGHTING, 7300 50th St., P.O. Box 1640, Milan, IL 61264 ... 309/799-3111
HOLOPHANE, 214 Oakwood Ave., Newark, OH 43055 ... 614/345-9631
J.H. BAXTER & COMPANY, P.O. Box 10797, Eugene, Oregon 97440 ... 503/689-3020
Manufacturer of Timberwood Lighting Standards. A superior pressure-treated Douglas fir laminate for decorative outdoor lighting support. Contact Richard Baxter.
PEMCO CORP., Philadelphia, PA, Exterior HID & Custom Lighting & Poles ... 215/236-9020
RUUD LIGHTING, 9201 Washington Ave., Racine, WI 53406 ... 800/558-7883
RWL CORP., 240 Sargent Dr., New Haven, CT 06511 ... 203/789-1710
STONCO, 2345 Vauxhall Rd., Union, NJ 07083. Contact Phil Henry at ... 201/964-7000
Outdoor lighting; fixtures and accessories for industrial, commercial and residential markets.
UNION METAL CORP., 1022 9th St. SW, Canton, OH 44707 ... 216/456-7653
Steel, aluminum and concrete poles for area, roadway and sports lighting. Hi-mast raise-lower systems. Ornamental nostalgia lighting poles and luminaires.
W.F. HARRIS LIGHTING, 4015 Airport Ext. Rd., Monroe, NC 28110 ... 704/283-7477
Indoor/outdoor decorative & vandal-resistant rustproof lighting for wall, ceiling, post & landscape applications. U.L. listed H.I.D., FL, INC & emergency fixtures.

CONTROLS

LEE COLORTRAN, Inc., 1015 Chestnut St., Burbank, CA 91506 ... FAX 818/954-8520 or 818/843-1200
VIEWPOINT, a field-configurable system of off-the-shelf Architectural Dimming and Control Components from Lee Environmental Lighting—a division of Lee Colortran, Inc.
LUTRON ELECTRONICS, 205 Sutter Rd., Coopersburg, PA 18036 ... 215/282-3800
STRAND ELECTRO CONTROLS, 2975 S. 300 W. Salt Lake City, UT 84115 ... 801/487-6111
Manufacturing full line of lighting controls and dimmers for Restaurants, Hotels, Board Rooms, etc.

DAYLIGHTING PRODUCTS

MULTIPOINT CONTROL SYSTEMS, 3101 111th St. SW #A, Everett, WA 98204 ... 206/347-3499
Full line of adjustable photocell lighting control sensors & systems for indoor/outdoor applications.

DECORATIVE LUMINAIRES (INTERIOR)

BRASS REPRODUCTIONS, 9711 Canoga Ave., Chatsworth, CA 91311. Decorative Fixtures. ... 800/828-5858
LIGHTSPACE DESIGN, 2111 Vine, Suite B, Berkeley, CA 94709. Consultant & MFG. ... 415/540-6023

DESIGN SOFTWARE & TESTING/MEASURING INSTRUMENTS

INTERNATIONAL LIGHT, Dexter Industrial Green, Newburypost, MA 01950 ... 617/465-5923
Radiometers, photometers, spectroradiometers, laser power meters for radiometry, photometry, UV curing, UVA/B phototherapy, germicidal radiometry & UV hazard use.

LAMPS

GENERAL ELECTRIC, Ad Response Dept., Nela Park #4151, Cleveland, OH 44112 ... 216/266-3200
GTE/SYLVANIA LIGHTING, Sylvania Lighting Center, Danvers, MA 01923 ... 617/777-1900
OSRAM CORP., P.O. Box 7062 Jeanne, Newburgh, NY 12550 ... 914/564-6300
PHILIPS LIGHTING CO., 200 Franklin Square Dr., Somerset, NJ 08875 ... 800/631-1259 800/752-2852
USHIO AMERICA, 20101 S. Vermont Ave., Torrance, CA 90502 ... FAX 213/329-3641 or 213/329-1960
Manufacturer of MR11, MR16, T3 Quartz, Minican and DC Bayonet Halogen Lamps.
VENTURE LIGHTING INTL., 625 Golden Oak Pkwy., Cleveland, OH 44146 ... 800/437-0111
Metal Halide, High and Low Pressure Sodium, Mercury, MR-16 and MR-11 Display Lamps. Many new and unique products not available from other manufacturers.

LANDSCAPE LIGHTING

ABEC LIGHTING, 4084 Arnold Ave., #8, Naples, FL 33942 ... 813/643-4242 or 813/643-3305
Quality outdoor landscape & security lighting. PVC construction. Fluorescent/low voltage available—all styles. Custom color & design. Commercial, residential, marine.
DINICO PRODUCTS, INC., 123 So. Newman St., Hackensack, NJ 07601 ... 201/488-5700
ELECTRO-ELF, 10011 Olive St., Temple City, CA 91780 ... 818/286-5002 Fax 818/579-1333
Energy Efficient Fluorescent lighting. Sealed Waterproof Fixtures available in many styles and colors.
HADCO, P.O. Box 128, 100 Craftway, Littlestown, PA 17340 ... 717/359-7131
IDAHO WOOD, Sandpoint, ID, Landscape Lighting (Wood) ... 800/635-1100 or 208/263-9521
NIGHTSCAPING, 1705 E. Colton Ave., Redlands, CA 92373 ... 714/974-2121

LIGHTING DESIGNERS AND CONSULTANTS

FREDRICK RAMOND INC., 16121 S. Carmenita Rd., Cerritos, CA 90701 ... FAX 926-1015 213/926-1361

LIGHTING POLES (WOODEN)

WOODFORM, INC., Portland, OR 97220-1230 ... 800/624-5091

OEM MANUFACTURERS

EDWIN GAYNOR CO., 200 Charles St., Stratford, CT 06497 ... 203/378-5545 or FAX 203/381-9019
For more information about fluorescent wiring devices, switches and lamp holders, call and ask for Jill Sapak.

OTHER LIGHTING SYSTEMS AND LUMINAIRES

CUSTOM NEON Mfg., Install interior neon. Portable & wall-mount art & signs. ... 213/937-6366
LIGHTING TECHNOLOGIES INC., 2540 Frontier, Suite 107, Boulder, CO 80301 ... 303/449-5791
Complete luminaire design and lighting system analysis software and consulting service.

REFLECTOR MATERIALS

ALCOA, Sheet & Plate Division, P.O. Box 8025, Bettendorf, IA 52722 ... 319/344-3007
ALUMINUM COIL ANODIZING CORP., 501 E. Lake St., Streamwood, IL 60107 ... 800/289-2645
Pre-anodized lighting sheet: specular, semi-specular, low iridescent, hammertone, diffuse, Everbriter.

CAREER OPPORTUNITIES

In This Issue

Manufacturers

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GTE/Sylvania: MR16 lamps.
Lightolier: Track fixtures.
Litelab: Neon sticks.
NASA: 300-watt quartz fixtures.
Osram: Halogen reflector lamps.
Sky-Skan, Inc.: Control system, multistrobe.
Thomas Industries: PAR can.
Times Square: Mirror ball.

Page 16. *A fast food restaurant with full-service flair* (Yin Place III, San Francisco, California).
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Halo: Recessed MR16 downlights.
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Shaper: Compact fluorescent sconce.
Staff: Suspended MR16 tube fixture.

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Garcy: Strip fluorescents.
GE Plastics Group: Lexan enclosures.
Greater Pittsburgh Neon: Cold cathode lighting.
Halo: Compact fluorescent downlights.
Hunt Stained Glass Studios: Stained, colored, and etched glass.
IBG International: Porte cochere skylight.
Kalwall: Insulated translucent panels.
Kurt Versen: Recessed downlights and wall washers.
Lightolier: Parabolic recessed fluorescents, wall sconces.
National Cathode: Cold cathode lighting.
Peerless: Bulkhead surface-mounted fluorescents.
Pittsburgh Corning: Glass unit masonry.
PPG Industries: Clear and tinted float glass.
Visa: Wall sconces.
Wausau Metal Corp.: Skylights and window-wall systems.

Manufacturer credits reflect the products specified for the projects; it is possible that other products were installed during construction or maintenance.

Photographers

William Britton, 2580 Pioneer Pike, Eugene, OR 97401, (503) 342-2034

Dan Cornish, ESTO Photographics, 222 Valley Place, Mamaroneck, NY 10543, (914) 698-4060

Christopher Little, 4 West 22nd Street, 10th floor, New York, NY 10010, (212) 691-1024

Dennis Marsico, 110 Fahnestock Road, Pittsburgh, PA 15215, (412) 781-6349

Barry Rustin, 934 Glenwood Road, Glenview, IL 60025, (312) 729-7227

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