



The angel-wing chandeliers provide the dominant lighting in the lobby. To keep the ceiling clear of distractions, luminaires line the perimeter. Incandescent, metal halide, dimming fluorescent and LED light sources blend gracefully, while meeting energy code, emergency and ambiance requirements.

The bells and whistles of new technology might sound exciting during the early stages of a project, but what looks great on a blueprint can be difficult to execute during construction. Such was the quandary facing Lightswitch Architectural, Chicago, the lighting design firm for the interiors of the new 27-story Wit Hotel in Chicago. With Lightswitch Architectural partner Avraham Mor managing the project in connection with architect Koo & Associates, designers had to balance the owner's aesthetic vision with what was technically and economically viable.

The owner originally lobbied for a fully LED-illuminated building. That idea was eventually deemed too expensive; however, solid-state lighting (SSL) luminaires using LEDs are at the core of the design. The LEDs offer ultra-long source life with low power consumption and low heat emission. "As long as a designer is familiar with and can evaluate the types of luminaires, SSL and LEDs offer myriad avenues for creativity and utility," says Mor.

A key element of the design was the use of color and light to convey mood. Each interior environment in the hotel—which include a lobby library, two restaurants and 7,000 sq ft of meeting space—is designed to create a special and specific at-

mosphere, enhancing the guest experience. To create the desired effect of warmer color and better color rendering, SSL luminaires are complemented by 90 different CFL, incandescent, fiber-optic and metal halide luminaires.

By carefully selecting the right types of complementary luminaires and lamps, Lightswitch Architectural was able to limit the number of lamp types to 20 throughout the hotel. These supplementary sources were used in quite specific applications. For example, in the lobby, incandescent lamps were used solely for emergency and evening lighting. Metal halide was used at the door entries on every floor and as accent lighting for painting and sculptures. In addition, occupancy sensors, where practical, detect when rooms are not being used.

FOURTH TIME THE CHARM

Most spaces in the hotel required a glowing light cove. Cove lighting helps create an effect of floating planes and, in high spaces like the multi-story lobby, reduces what may be perceived as overpowering ceiling height. Coves are used on every floor of the Wit (34 coves total). In the lobby, the cove above the prominent angel-wing ceiling luminaire spans 11 ft by 17 ft.

After a review of all lamp options, cove lighting became the perfect way



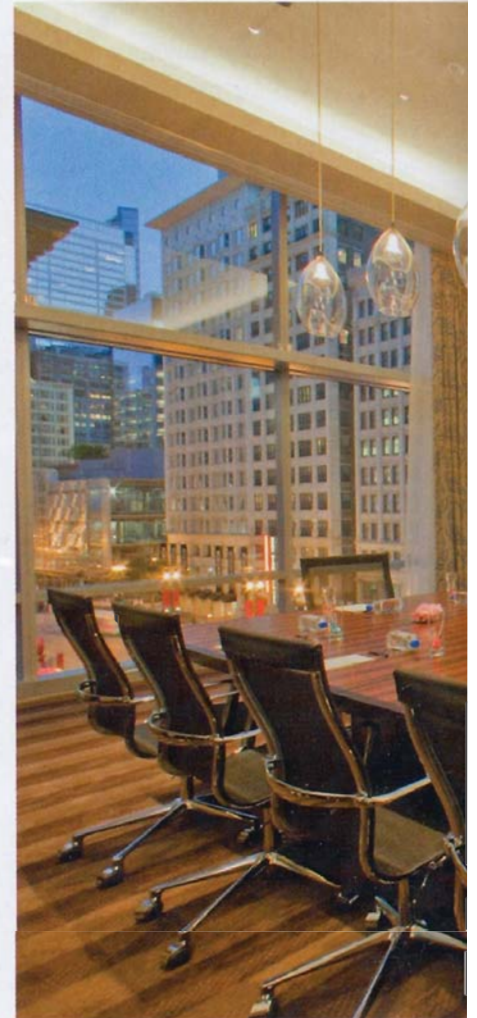
The owner's desire for an LED-dominated interior led designers on a long quest to find just the right luminaires for Chicago's new Wit Hotel

EASIER SKETCHED THAN DONE

PROJECT



Spa lighting is dim, comfortable and warm. Spa treatment rooms have dimmable LED under-cabinet lighting, controlled by the service provider. The reception desk is lighted even when the spa is closed, extending an invitation for the guest to return.



to incorporate the owner's desire to use LEDs. Standard-fare incandescent has worked for years in ceiling coves but it uses a lot of energy, requires significant maintenance and gives off excess heat. Fluorescent options exist, but the larger fixtures would have required larger coves, and as the project progressed, the ceilings had to be lowered repeatedly due to the mechanical systems above the ceilings. Other options, such as cold cathode or neon, would work but they both required total customization, special conduit and large transformers. The concern became where to locate the necessary transformers. Since the design plans

called for a "glowy" cove, and the coves would not be required to functionally light the space, LED became the tool of choice.

It was at this point that the real work began.

The first SSL system considered was specified for its small size and asymmetric distribution of light. The system suggested the possibility of "amazing photometrics," says Mor, but it required drivers every 8 ft and a junction box every 16 ft. For the purposes of the cove in the lobby, that would have resulted in eight drivers, eight dimming interfaces and four junction boxes. Later, during the bid processes,

this manufacturer was value engineered from the project.

A direct linear LED luminaire from a second manufacturer did not offer asymmetric light distribution but it would achieve the desired look. This product required drivers every 16 ft and a junction box every 32 ft. There was difficulty in dimming the lighting, as a DMX control signal was required to daisy chain from fixture to fixture. This would be fairly expensive to install. "We explained this to the contractor; however, six months later, this product was no longer available. We were left searching for another option to light the coves," Mor says.



Cove lighting in this conference room features the luminaire specially made for the 34 coves in the hotel; 3,500 ft of track and 10,500 SSL cove luminaires were deployed.

With SSL luminaires, the designer and contractor have to understand driver quantities and limitations, Mor adds. “Run lengths are essential, as is calculating how far away the driver can be placed from the luminaire. And remember that when using fluorescent lighting, for example, the ballasts can be housed next to the lamp. With LED luminaires, the driver cannot be housed near the lamp; the heat generated drastically shortens the lamp life.” The LED dimming protocol is different and a designer must think, in advance, about DMX or 0-to-10-volt technology and how it is going to function with the control system.

If there are dimming interfaces required, “Who will handle the installation and take responsibility for the functional system? Additionally, is the dimming system compatible with all those parts?” Mor asks.

A third system from a third manufacturer offered excellent color temperature and solid LED binning. The fixture allowed for simple installation and ease of service and maintenance. Dimming was done simply and required no special equipment. But the Chicago building code proved to be an insurmountable challenge, as electrical inspectors prohibit passing 120 volts from fixture to fixture

through a molded connector on a luminaire. Consequently, the product would not have been permitted by the project inspector.

Finally, the electrical distributor and supplier, Evergreen Oak Electric, presented the Juno LED Linear Lighting Track luminaire, which worked on the Track 12 System (the track has been in use since the early 1990s). The luminaire, itself, was so new that the project commissioned the first three ever produced. “The color temperature was excellent and the technology was solid,” says Mor. “The luminaires were removable and replaceable and dimming for these fixtures required no interfaces.” Working on a 12-V track system with 300-W transformers and a maximum run length of track of 37 ft (from track to transformer), the solution for the lobby cove light was found. The only drawback with this system was that the track is not designed to be angled. The answer was to have carpenters build a wedge add-on that the contractor mounted on the track, angling the fixtures outward to shift the light out of the cove. There are two transformers in the lobby ceiling and one junction box that feeds left and right. Throughout the 34 coves in the hotel, there are 3,500 linear ft of track holding 10,500 SSL track luminaires and 46 transformers.

EDUCATING THE EDUCATED

LED technology is often difficult for contractors to understand. “They have not been trained to stay up to date with the technology and therefore do not understand its benefits and limitations,” says Mor.



Theater luminaires prevent light from spilling towards the screen. Fiber optics, halogen lamps, LED luminaires, MR16 downlights and theater spots fulfill the design requirements and provide full flexibility.

To bring a design to fruition, designers must remember that luminaires need to be serviceable and that misreading drawings creates bidding errors.

The theater in the Wit was an area where LED lighting became complicated. Built for local and visiting corporate events, the THX/Dolby Digital theater hosts private movie screenings, sporting events and training videos. The owners wanted very special control over the lighting in the theater, which would require dimming across the whole space. Additionally, it was imperative to avoid adding any extra noise from luminaires or other mechanical parts to the room. To light the stairs and floor, steplights (Winnona) were incorporated. Alone, they are very simple to install. But when dimming is required, wiring must be passed through a driver, a dimming interface and then (in this case) a Lutron dimming panel.

Neither the contractor nor manufacturer was familiar with this procedure, says Mor. Also used in this space is an LED in-grade lumi-

naire, driver and dimming interface, all controlled by the same Lutron dimming panel and all made by different manufacturers. Each component requires placement in an electric box, as heat is an issue for the drivers. This was not a simple task, notes Mor. “Who would provide the enclosures? Where would they be placed? And how would all the wires be terminated?” he asks. Mor ultimately had to detail on all drawings what these interfaces were and where the enclosures should go. “We also had to educate the contractors and electricians on proper installation. Placing the housing components outside of the room was a workable solution, but it required some skilled creativity and customization in design and implementation.”

The design was just as demanding in the hotel conference rooms where DALI technology is incorporated. This space represents a major partitioning control installation using the Lutron GrafikEye QS ES and Lutron EcoSystem ballasts. “The technology is so new that very

few people have experience with it,” says Mor. “Typically, three downlights are linked together and run to a dimmer panel. In the DALI-controlled conference rooms, all fixtures interconnect and lead back to the Lutron GrafikEye QS ES control panel. This technology saved on installation, energy use and space for a dimmer cabinet within the conference rooms.”

NOT TYPICAL

The Wit was an unusual project in other ways. The owner supplied all the fixtures to the contractor for installation saving ⅓ of the cost of the luminaires. Evergreen Oak warehoused all of the fixtures for the project months before they were needed and delivered the fixtures by floor in three shipments. Ninety-five percent of the luminaires in the building were made in North America; the remainder are European.

For Lightswitch Architectural, the project was a three-year process, from design through construction—“a labor of love,” as Mor describes it. “Designers are not typically this heavily involved with constant modifications during construction. Because the owner supplied the lighting system, it was easier to maintain control and make adjustments to the products along the way.”

With complicated technologies increasingly being integrated into lighting projects, Mor believes the Wit also speaks to the need for all project team members to be thoroughly educated about the intricacies of LEDs.

That education is now on display in this Chicago hotel. ↗

METRICS THAT MATTER

The Wit Hotel

Watts per sq ft: 1.1 (complies with ASHRAE/IESNA 90.1-2004)

Energy Cost: First electrical bill = \$4,000 (typical bill for a property of this size is \$10,000).

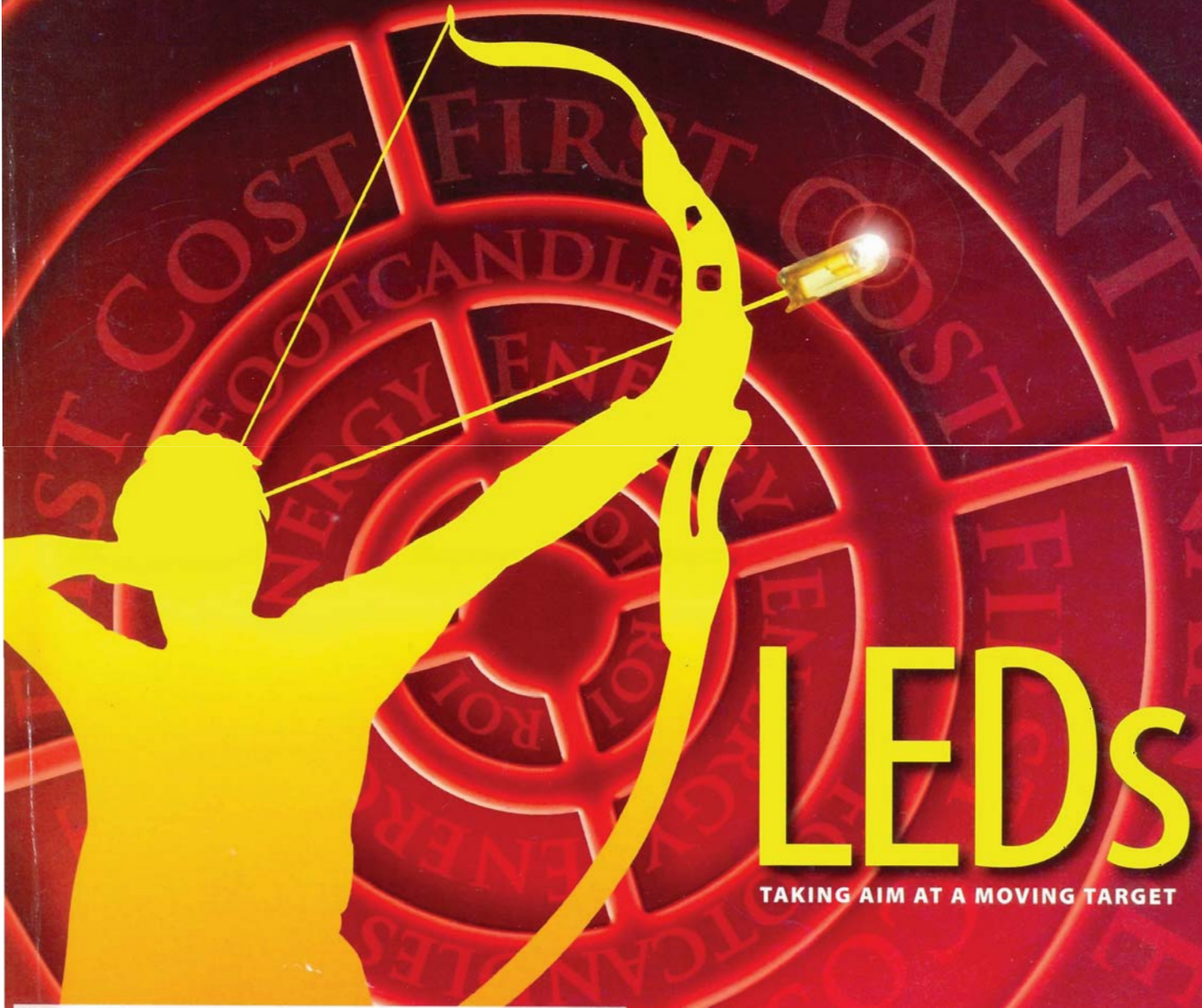
Illuminance Levels: front desk = 38 fc; business center = 40 fc; lobby = 20 fc (daytime); admin office = 60 fc; gift shop = 30 fc; restrooms = 30 fc; prefuction areas = 35 fc; conference rooms = 50 fc; guest rooms = 30 fc; guest room bathrooms = 50 fc at face, 35 fc at counter
Lamp Types = 20



About the Designer: Avraham (Avri) Mendall Mor, IALD, LEED AP, Member IES (2000), is a partner and senior designer in the Chicago office of Lightswitch Architectural. Past projects include the Fairfield Hotel, Chicago; Ancient Americas at The Field Museum; and Joe's Seafood Prime Steak and Stone Crab, Las Vegas. Prior to joining Lightswitch, he served as project manager for Chicago Spotlight, Inc. and lighting designer for both GPW & Associates and Schuler Shook. Mr. Mor also serves as a committee member and forum reviewer for DOE's Next Generation Lighting Industry Alliance and speaks at several DOE conferences on the future of solid-state lighting (SSL) and luminaire technology. He holds a Bachelor of Fine Arts degree in Architectural and Theatrical Lighting Design from the University of Kansas in Lawrence. He is the president of the IES Chicago Section.

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