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SPECIFIED LIGHTING DESIGN

The lighting resource for architects and designers

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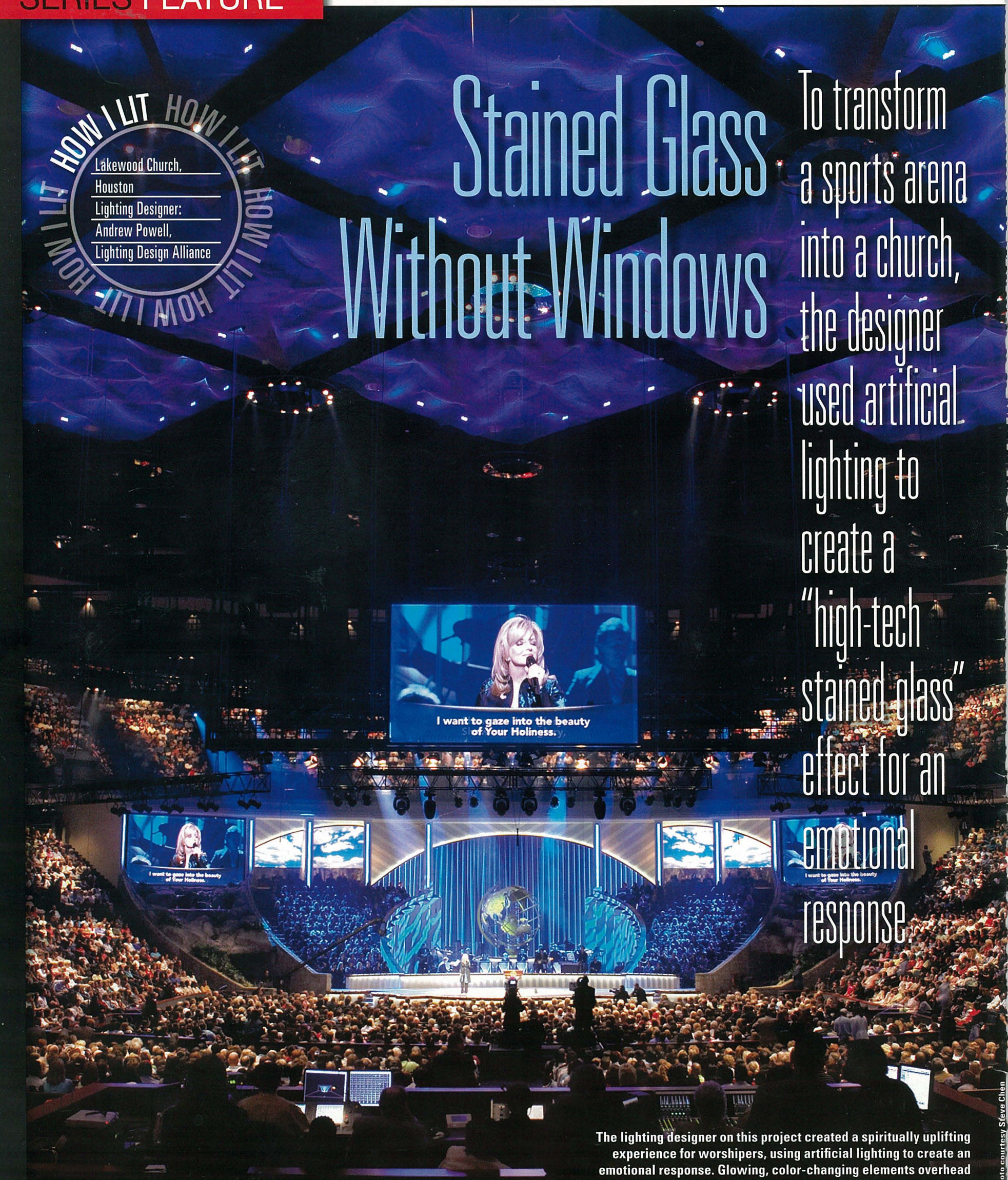
Lakewood Church,
Houston
Lighting Designer:
Andrew Powell,
Lighting Design Alliance

Stained Glass Without Windows

To transform a sports arena into a church, the designer used artificial lighting to create a "high-tech stained glass" effect for an emotional response.



The lighting designer on this project created a spiritually uplifting experience for worshipers, using artificial lighting to create an emotional response. Glowing, color-changing elements overhead function as a "high-tech stained glass window."

Photo courtesy Steve Chen

How does a sports arena become a house of worship? In mid-2003, the Lakewood Church in Houston, one of the nation's largest, had outgrown its existing 7,800-seat sanctuary. About this same time, the city of Houston completed a new sports arena for its NBA and NHL teams, and had to decide what to do with the old arena, the Compaq Center. Both problems were solved when the two parties entered into a long-term lease agreement, making the arena Lakewood's home for the foreseeable future.

Much needed to be done, however, to turn this former sports facility into a 16,000-seat church—a facility that would become the largest regularly-used worship center in the U.S. Lakewood embarked on an ambitious $95-million renovation and expansion of the facility. Many of the existing building systems needed to be stripped out and redone to support the new building functions, including virtually all of the lighting.

Lighting Design Alliance (LDA), Long Beach, CA, was contracted to design the lighting for the interior public spaces, including the sanctuary space. Not included was the stage/television lighting system, which was designed by a separate lighting consultant specializing in that discipline. LDA's scope also included the exterior building façade, exterior walkways, and parking area.

Ready for the close-up?

Those involved in operating and maintaining the lighting in Lakewood's old facility were very helpful in explaining what worked with that system, and what didn't work. Since Lakewood's services, featuring its charismatic pastor, Joel Osteen, are televised, and since concerts and special events are also held in the sanctuary, they had attempted to create a dramatic theatrical look to the "house lighting" (seating areas) in the space. The actual lighting had been installed in a very non-uniform, spotty manner. This was counterintuitive to the LDA designers, as they initially approached the problem from the standpoint of providing adequate functional lighting for worshipers (reading tasks, circulation, and egress). This seemed to point toward a scheme that produced more uniform lighting. Some additional challenges included:

- Throw distances varying from 20 to 80 ft.
- Mounting locations were limited to the existing sports lighting catwalks and a new "stage" lighting catwalk
- Lakewood's desire to be able to dim all house lighting
- A requirement to lay out and aim the fixtures and zone the dimming system in such a way as to allow each seating section to be controlled separately from other seating sections. Thus, if the arena was not full for a particular service, some seating sections could be left empty, and lighting for those sections turned off. To support this requirement, the luminaires needed to have very precise optics to prevent light from spilling into other sections.

Through the use of computer renderings and calculations, as well as on-site mock-ups, several systems were evaluated. Initial and maintained costs were also factors influencing the decisions. Ultimately, a scheme using more than 350 halogen, theatrical ellipsoidal fixtures addressed all of the functional, aesthetic, and budgetary requirements.

The ETC Source Four (Electronic Theatre Controls, Middleton, WI) fixture proved to have the punch and precise optics needed. It was available with four standard lenses so that beamspreads could be adapted for various throw distances. Lamps are accessed from the back of the fixture, allowing easy re-lamping without disturbing the aiming. In addition, Lakewood's lighting designers and maintenance personnel were familiar and comfortable with the product. The combination of precise optics and a carefully planned dimmer zoning scheme allows Lakewood's lighting staff to set up scenes for very uniform lighting, or spotty lighting—as needed for a given function.

Computer calculations and renderings were important tools used by LDA's designers when trying out concepts such as which optics to use where and how to zone the lighting within each seating section. The program also generated a plan that showed where each fixture was to be aimed. This plan was forwarded to the contractor so that a first pass at focusing could take place without the designers being present. During LDA's final site visit they only had to fine-tune the aiming, which reduced the designer's time in the field.

High-tech stained glass

A sports arena is no Gothic cathedral when it comes to creating a spiritually uplifting experience. While natural light helps to provide this in most traditional churches, the architect on this project called upon LDA to use artificial lighting to create the emotional response. This was achieved by turning the existing catwalk system into a glowing, color-changing element, resulting in a kind of high-tech stained glass window effect.

Color-changing LED floodlights illuminate a white netting material suspended inside the 40 x 40 ft. squares within the existing catwalk grid. On-site mock-ups, once again, played an important role to help determine the best color and density of netting material, as well as the best location and quantity of luminaires. As ETC had done with the house lighting mock-ups, Color Kinetics (Boston) provided the sample fixtures necessary to mock-up one 40 x 40 ft. section. This proved to be invaluable. Not only did it help with practical design decisions, it got the client excited about the concept.

An ETC dimming system controls the stage and house lighting systems and allows Lakewood's lighting personnel to control all components together to create very dramatic scenes for their concerts and special events.

Street presence

The arena exterior was basically a featureless box. On the side of the building that faces a major freeway, the architect added a series of bold, four-story columns and a large signage feature.

Flush in-grade uplights accent each column, while indirect pedestrian post-top fixtures and recessed steplights illuminate the new stairs and walkway. All three lighting elements were specified with 3000 K ceramic-metal-halide lamps for color consistency and a warm appearance.

Contrasting this warmth, the large signage feature (made of a dark stone) was illuminated with blue spot lights. Originally there was to be a fountain at the base of this curved element, and the uplights were suitable for underwater use. The fountain was eventually eliminated due to cost. As it turned out, the specified uplights (a metal-halide underwater uplight by Hydrel, Sylmar, CA) were suitable for use in or out of water, so they remained and can be used in the water feature when it is added at a later date. Blue metal halide lamps by Venture (Solon, OH) were used to produce the blue color.

The dramatic lighting has obviously enhanced the experience for Lakewood's congregation, as the church has recently been named the largest church in the country, according to *Outreach* Magazine's Annual 100 list of America's largest and fastest-growing churches. Weekly attendance is estimated at some 47,000 worshipers.

"It is overwhelming, unbelievable, fantastic," original congregation member Ann Bell was quoted as saying after the first worship service in 2005. "Words can't even describe it." ◢

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