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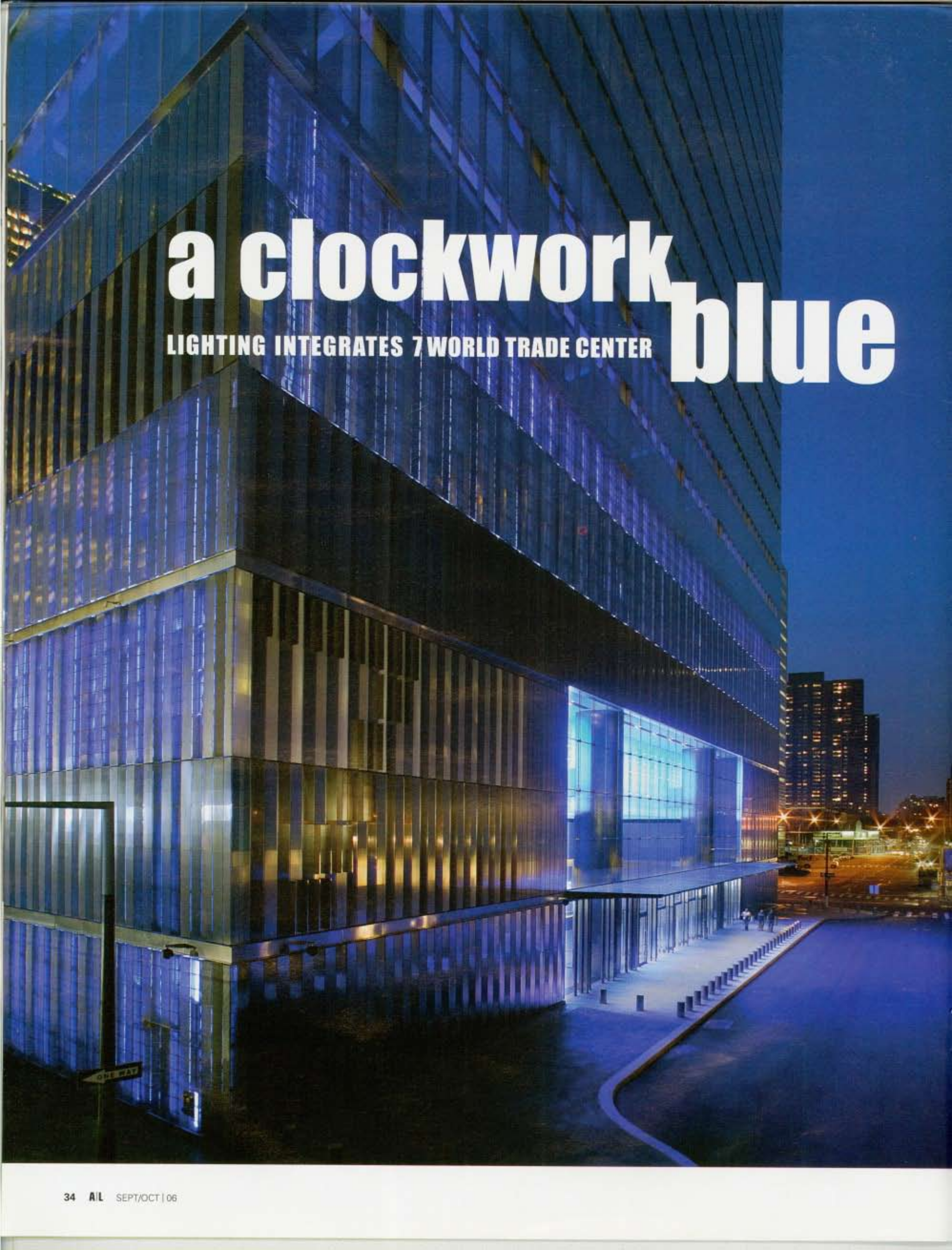
architectural | lighting



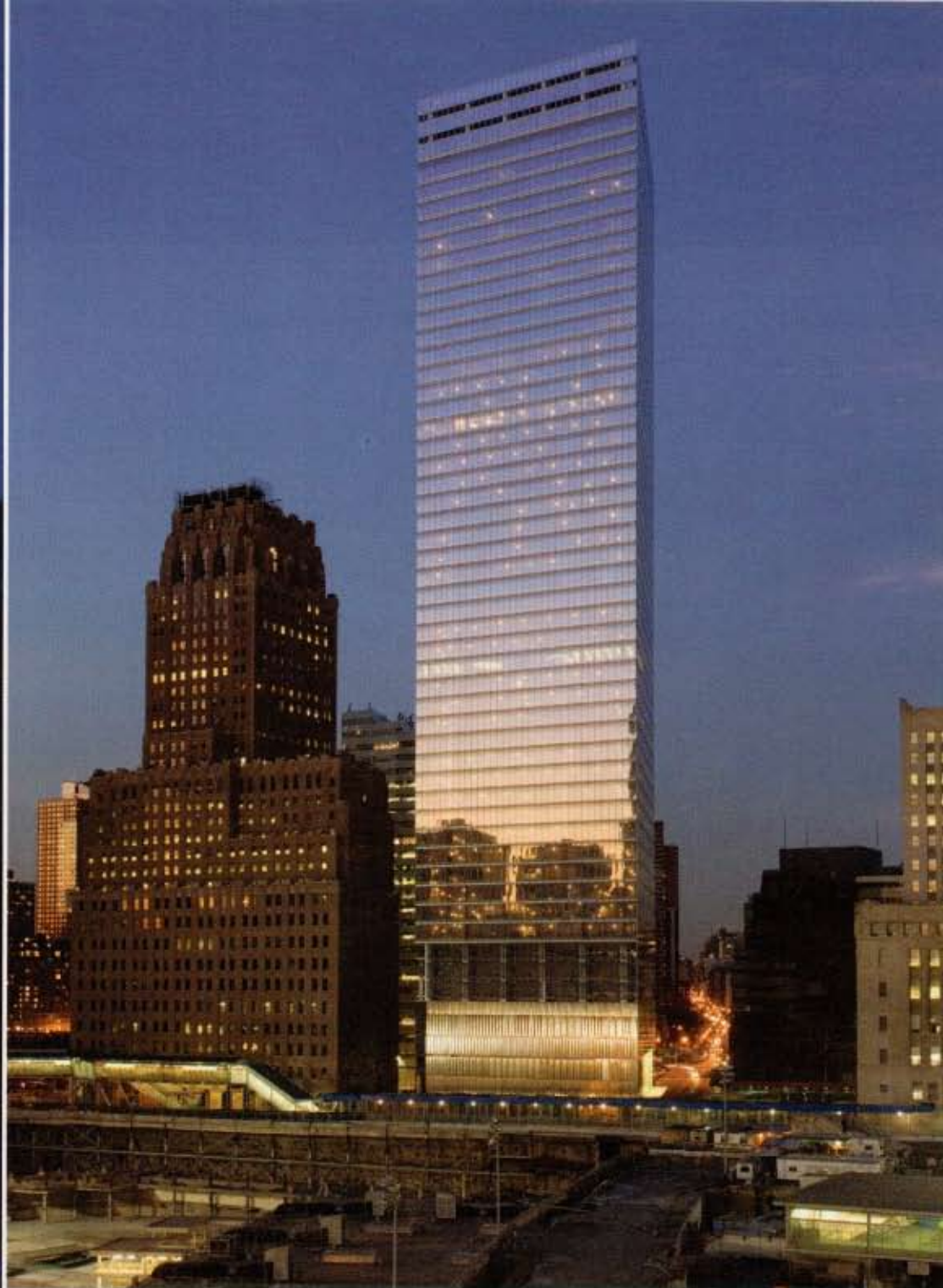
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DIVERSE DESIGNS AND THEIR SOURCES



a clockwork LIGHTING INTEGRATES 7 WORLD TRADE CENTER blue



BEFORE DESIGN BEGAN ON 7 WORLD TRADE CENTER, THE FIRST STRUCTURE TO RISE OUT OF THE ASHES OF THE 9/11 ATTACKS, architect David Childs of Skidmore, Owings & Merrill (SOM) outlined a daunting task for his team. The project, he said, should set the bar for design and technical considerations—environmental sustainability, urban sensitivity, construction detailing, and security—for all future buildings to rise at Ground Zero and the surrounding area. As part of their response to this directive, the architects pulled 7's footprint 115 feet back from the original eastern site boundaries, restoring the path of Greenwich Street through lower Manhattan, and in turn creating a triangular-shaped public plaza, known simply as Triangle Park. The tradeoff to restoring this piece of the city's fabric was the resulting smaller footprint and the necessity for the 10 Con Edison transformer vaults programmed for the site to occupy a larger portion of the building's base. In this configuration, the first 80 feet of the 741-foot-tall, 1.7-million-square-foot structure was consigned to a windowless concrete block, above which the tower's glass curtain wall begins. The architects' challenge was to find a way to fuse the disconnected structure into a cohesive architectural experience. Their solution was light. Says Chris Cooper, an SOM associate partner assigned to the project, "Our idea was to use light as a way to dematerialize the density of the concrete and link that part of the building with the glass-clad upper volume."

SOM's concept envisioned a cube of light embedded within the concrete box that would first appear in the lobby, then bleed out through the walls of the windowless base, and shine up into the curtain wall, thus linking podium and tower. The architects called on the help of two New York-based firms that specialize in lighting solutions for architecture—Cline Bettridge Bernstein Lighting Design

Sunset shimmers on 7's southern façade—from the stainless-steel screen wall at the building's base, to the curtain wall's Low-E glass, specially treated with a slightly reflective coating. Both 7 World Trade Center and the Verizon Building to its left humbly stand guard over the reconstruction work at the Ground Zero site in the foreground (above). At night, 7 comes alive with the lobby's luminous "light box" ceiling, while outside, an interactive LED light feature adds dimension to the double-layer metal scrim wall (left).

(CBBLD), who could take SOM's concepts and make them work fixture to fixture, and James Carpenter Design Associates, whose expertise lies in controlling light with surface and material. In collaboration with James Carpenter, who had previously worked with David Childs and CBBLD on the Time Warner Center at Columbus Circle, the architects developed a cladding surface for the Con Edison vaults that interacts with electric as well as natural light—a stainless-steel screen-wall system. Fabricated by Johnson Screens, a company that normally manufactures its product for hydroelectric dams, the wall system is composed of 5-foot-wide modular panels of varying height that incorporate two surfaces (one interior and one exterior) of vertically strung stainless-steel bars. Each bar is triangular in plan, with the apex welded to the panel framing at varying angles, forming an "a-b-a-b" pattern of four vertical stripes per panel. During the day, sunlight plays across this patterned surface in much the same way that it moves across the slightly reflective coating on the Low-E glass of the curtain wall. At night, the inner screen layer takes over, acting as a reflective backdrop to a customized LED lighting feature designed by CBBLD.

"For years, people have been used to seeing LEDs in large-screen applications like you see in Times Square," says senior associate Michael Hennes of CBBLD, "but incorporating LEDs into a curtain wall or building requires an integration of the trades that goes beyond providing hangers for signage." The only available location to install a fixture within the screen wall was at the joint between panels. For aesthetic reasons, SOM wanted to keep that joint down to a mere 1-inch width, leaving a very narrow space for the lighting feature. Working closely with manufacturer LED Effects, CBBLD designed a waterproof fixture (the screen wall is cleaned with a power hose) that fits within the joint, while casting light at contrasting angles against the inner screen wall. Here, the patterning of the screen was also essential, as it helped diffuse the light evenly across the surface, while avoiding hot spots. To provide maintenance access, CBBLD arranged the fixtures on quick-connects, which are attached to the back of the fascia joint-covering panels and are easily removed.

Inside, the light feature takes the form of a point-supported-glass-clad box, which fills the upper portion of the double-height lobby volume. While the architects decided on blue as the color of the curtain wall light feature for its peaceful, calming effect, its lobby counterpart, which serves practical lighting purposes during the day, had to glow white. Rather than flip a switch at an appointed hour to go between day and night modes, CBBLD created a smoother transition by throwing a bit of red into the mix. They also chose fluorescent lamps for the interior instead of LEDs. "LEDs are great for effects,"





The number "7" emerges from the podium screen-wall panels (facing page, top). Visitors are greeted in the lobby by an art wall installation of streaming text, designed by artist Jenny Holzer (above). The other main lobby feature is a point-supported-glass-clad box, which fills the front portion of the double-height volume. By day, the "light box" is illuminated in white with tri-phosphor fluorescent lamps. By night, it switches to a cool blue (left) to match the building's exterior. Incandescent accent lights line architectural coves along the lobby's perimeter (facing page, bottom).

comments Hennes, "but they didn't provide enough general illumination for the lobby space." Hidden behind the glass, which has a light-diffusing interlayer, the fluorescent fixtures are composed of three-lamp strips on dimming ballasts that control each lamp separately. Each fixture holds three T5s with color in the phosphor—one blue, one red, and one white. This avoided the dimming effects of colored gels and allowed for an even tone of light.

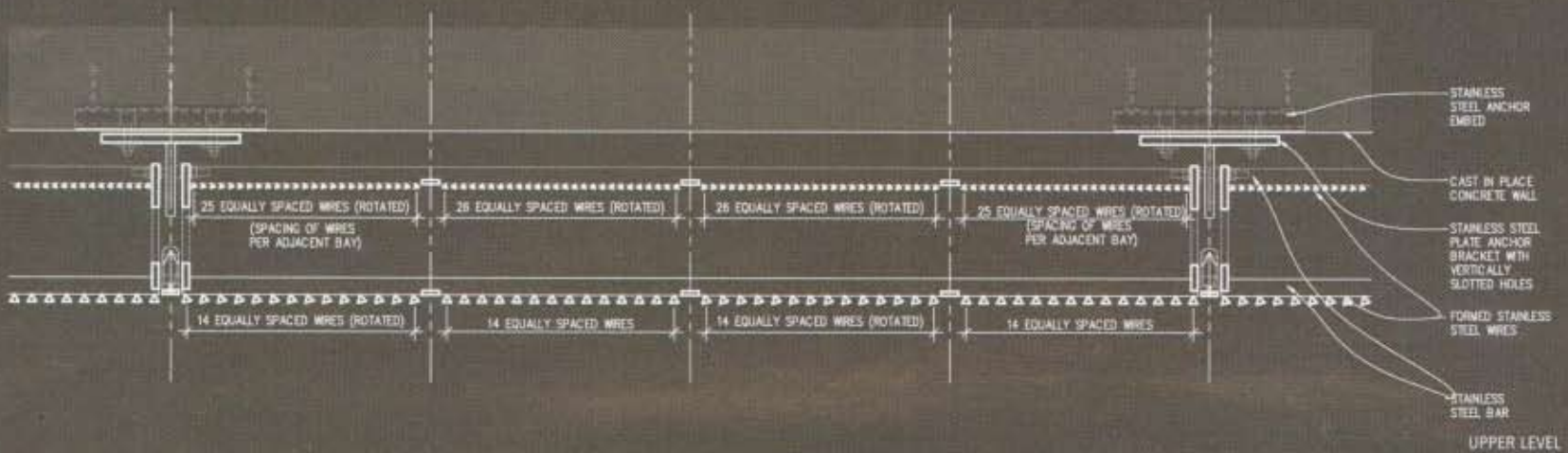
All of the fixtures, interior fluorescents and exterior LEDs, link back to a dimming control system. As daylight wanes and the sky takes on the purple tones of sunset, the lobby volume itself transforms into a violet-glowing space. Then, as twilight and darkness descend, the lobby transitions to a cool blue color. This color change is also echoed by 116 LED floodlights, incorporating red, blue, and white LEDs, situated on 6-foot centers around the top of the screen wall, which shine up into a glass-louvered mechanical level. The rest of the screen-wall lighting, however, incorporates only white and blue LEDs. It also comes on as night falls, glowing cool blue.

Cool blue, then, is the primary color of 7's night, except for two unique elements of the lighting system. The first is an interactive feature designed by Kinacity located on the north and south façades, which, unlike the east and west façades, are solid screen walls without lobby or loading dock openings: Motion sensors embedded in the screen wall detect the movement of people on the sidewalk and track their passage with a scrolling, illuminated deep-blue bar that extends the full height of the screen wall. "It's like street theater," says Chris Cooper. The second exception to the cool-blue wallpaper is that every hour, on the hour, the entire lighting feature transitions to deep blue and then back to cool blue, just like clockwork.

No matter whether one approaches 7 from the north on Greenwich Street, sits gazing at it from Triangle Park to the east, or spots the building from the south across the expanse of Ground Zero, day or night, it is hard to believe that this is a glass box sitting on an 80-foot-high metal-clad concrete podium. So effective was the designers' control of daylight and use of electric sources, the absence of windows, for example, at the building's base feels completely natural and intended, a testament to what can be achieved when lighting and architecture become one. **AARON SEWARD**

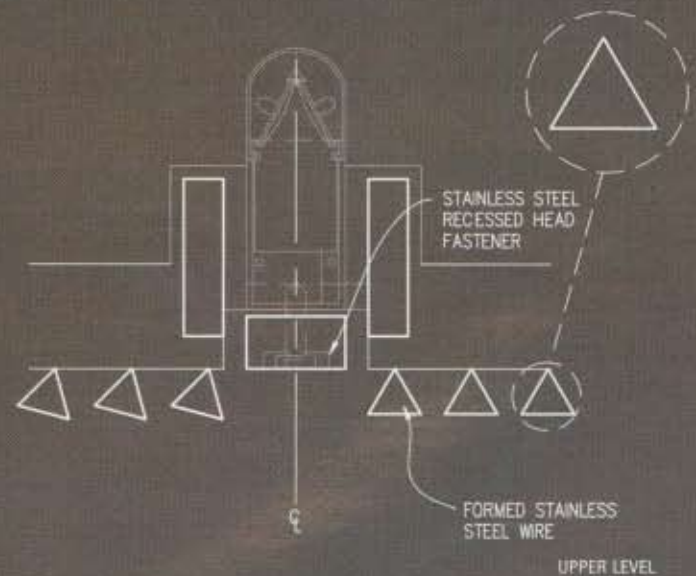


UPPER LEVEL



UPPER LEVEL

A stainless-steel podium screen-wall system with an interactive LED lighting feature conceals 10 Con Edison transformer vaults located at the building's base (top). Sensors embedded in the wall detect people's movement, and mark their passage with a scrolling blue bar that runs the full height of the screen wall (middle). The podium wall is comprised of five-foot-wide modular panels of varying height that incorporate an interior and exterior layer of vertically strung, triangular-shaped stainless-steel bars. The bars are attached at different angles forming an "a-b-a-b" pattern (above). A detail of the vertical bars at the mullion joint (right).



UPPER LEVEL

DETAILS

PROJECT 7 World Trade Center, New York
DEVELOPER/OWNER Silverstein Properties, New York
LANDOWNER Port Authority of New York and New Jersey
ARCHITECT Skidmore, Owings & Merrill, New York
LIGHTING DESIGNER Cline Bettridge Bernstein Lighting Design, New York
COLLABORATING ARTISTS James Carpenter Design Associates, New York (podium screen wall); Jenny Holzer, New York (art wall installation in lobby)
LANDSCAPE DESIGNER Ken Smith Landscape Architect, New York
PROJECT SIZE 1.7 million square feet
PHOTOGRAPHER David Sundberg/Esto

MANUFACTURERS

Cathode Lighting Systems

Design Plan

Edison Price

Kim Lighting

LED Effects

Legion Lighting

Lighting Services Inc

Lightoller

Linear Lighting

NeoRay

Osram Sylvania

Specialty Lighting Industries

Venture Lighting

APPLICATIONS

Surface-mounted, continuous linear desk fascia uplight at lobby reception desk

Custom-designed LED exterior-grade strip fixture at stainless-steel podium screen wall

Recessed compact fluorescent downlights in elevator lobbies; recessed metal halide adjustable downlights at exterior loading dock; compact fluorescent downlight at typical core restrooms

Surface-mounted metal halide uplights at exterior tower crown

Custom-designed LED exterior-grade strip fixture at stainless-steel podium screen wall

Fluorescent lighting in lobby glass-box light feature; surface-mounted T5 fluorescent strip in elevator cabs

Incandescent adjustable accent light in architectural slot in lobby portion of high ceiling near glass/cable wall

Fluorescent troffer at ground-floor back-of-house offices and typical tenant corridors

Perimeter louvered wallwasher at ground-floor elevator lobbies

Fluorescent striplights in typical core restrooms

T5 colored phosphor lamps in lobby glass-box light feature; lamps used throughout the project

Surface-mounted linear low-voltage lensed striplight integrated into canopy structure faceplate

250W, 4000K pulse-start metal halide lamps for exterior tower crown floodlights

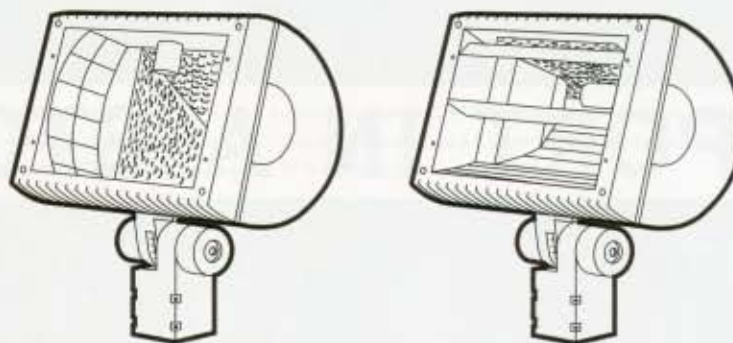


LIGHTING SERVICES INC | 500 SERIES | LIGHTINGSERVICESINC.COM

This series of quartz halogen incandescent 500W PAR56/64 adjustable spotlights is suited for long-throw applications in areas that require high-intensity accent lighting. The luminaire measures 7 3/4 inches wide by approximately 10 inches tall and is constructed of heavy-gauge steel and aluminum, with full yokes for universal swiveling. Available in five standard finishes, a full complement of accessories is also available. At 7 World Trade Center, this fixture is recessed in an architectural slot in the main lobby's portion of high ceiling. **CIRCLE 145**

KIM LIGHTING | AFL20 ARCHITECTURAL FLOODLIGHTS | KIMLIGHTING.COM

This family of architectural floodlights has a range of seven standard beam patterns from wide flood to horizontal spot. Each fixture housing is fabricated from a die-cast, low-copper aluminum in a cylindrical shape with integral cooling fins over its entire length. Several accessories and finishes are available. For 7 World Trade Center, the lighting designers selected this luminaire—with 250W, 4000K pulse-start metal halide lamps for their consistent color—in order to illuminate the building's exterior tower crown. **CIRCLE 146**



OSRAM SYLVANIA | PENTRON PRIMARY COLOR LAMPS | SYLVANIA.COM

These 28W T5 and 54W T5HO lamps produce red, green, or blue light by using special phosphors, rather than modifying white light sources with external filters. For 7 World Trade Center, the lighting designers selected these lamps in red, blue, and standard white, to be used in the linear fluorescent micro-profile strips horizontally mounted in the lobby ceiling glass-box light feature. Prior to their installation on this project, these lamps were a European-only offering. Now, these tri-phosphor lamps are available for specification in the United States. **CIRCLE 147**

