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Preface

Jean Sundin and Enrique Peiniger are the founders and principals behind a refreshingly different architectural lighting studio. Instead of being called in at the end of projects, they participate from very early conceptual stages, and provide creative input while designs are still being shaped.

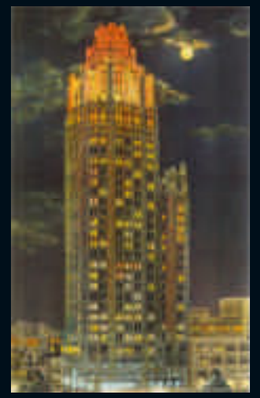
The name of their firm—Office for Visual Interaction (OVI)—points to the possibilities of this kind of practice. Light is treated as a primary architectural component, with the ability to transform spaces through its interactions with surfaces, volumes and materials. Used to its fullest potential, light visually shapes and models architecture, without physically altering it.

Since 1997, Sundin and Peiniger have amassed an impressive portfolio, counting the world's foremost architects among their clients. The quality of their work—as well as the power of their integrative design approach—has been proven through the successful completion of signature projects around the world. In each case, lighting does more than simply meet technical requirements. It reinforces and participates in architectural gestures, and creates powerful nighttime icons.

This book documents a selection of OVI's projects. It is not a picture book, nor a glossary of technical terms and lighting formulas. Rather, it provides a glimpse of the fascinating processes by which Sundin and Peiniger develop architectural lighting design. The duo's sophisticated solutions are showcased in their progression from initial concept sketches, through advanced computer models, to final realized details.

Just as architectural design is a complex process involving a multitude of stages and decisions, OVI inhabits a parallel universe of lighting design considerations, strategies and opportunities.

by Elsa Lam



Chicago Tribune - Postcard 1925
Architects: Raymond Hood and John Mead Howells
Lighting Designer: Basset Jones

Projected Trends: Verticals on wide avenue - Metropolis of Tomorrow 1929
Architects: Hugh Ferriss

Wrigley Building
Architects: Graham, Anderson, Probst & White
Lighting Designer: HOK

Introduction

Illuminating Architecture: The work of OVI

by Prof. Dietrich Neumann

When lighting designers first approached architects to offer their services more than a hundred years ago, their overtures were met with "passive or active antipathy"[1] as one of them put it in 1909. Architects initially had little use for a new, ephemeral art that set out to illuminate the facades of their structures at night. They feared floodlights would create unsightly shadows or the glare of lightbulbs would make buildings invisible.[2] Moreover, many of them felt confident that they could handle a building's night lighting without any outside advice.

While the illumination of architecture became very popular during the 1920s, it would usually be applied as an afterthought to existing buildings, such as historic monuments, churches, city halls or banks. Rare were the cases in which an architect would involve a lighting designer in the design process from the start, with a resulting building making concessions towards its nighttime appearance. The Wrigley Building in Chicago of 1921 is one such notable case, with its terracotta skin increasingly brighter towards the top in order to offset the waning rays of the floodlights below. A few years later, Raymond Hood's Tribune Tower responded to the bright halo across the street by offering a sophisticated Gothic setback, its delicate tracery backlit by a mellow, amber glow—an "architecture of the night" as Hood called it.[3]

At the same time, European avant-garde architects dreamed of a "Light Architecture," in which light would become a true building material, and envisioned luminous structures, in which space and light were the new religion. Few critics recognized enormous potential of architectural illumination at the time. Most prominent among these was Douglas Haskell, who proclaimed in 1931: "Thousands of years went by with their changes of style, but not until this century was there electric light, which, far, far more than the familiar triad of steel, glass and concrete has changed the basis of all architecture."[4] Haskell had been deeply impressed by the vision of a Metropolis of Tomorrow, published in 1929 by Hugh Ferriss, a prominent architectural delineator, who depicted the future American City preferably in foggy night, its skyscrapers soaring under the beams of powerful floodlights.

It would take another twenty years before Richard Kelly emerged as the first independent architectural lighting designer. Trained at Yale's architecture school during World War II, Kelly developed lighting concepts that were extraordinarily sensitive to the causes of architecture. The light source became invisible—Kelly had introduced recessed ceiling lights in the 1930s—and he instead focused on luminous space, reflective materials and responses to functional change.

Kelly's career began at a felicitous moment. A range of new lighting technologies had been introduced just as modern architecture became firmly established as the dominant style. Kelly made architectural lighting design broadly accessible and comprehensible when he described his fascination with "ambient luminescence", "focal glow" and the "play of brilliants."[5] He was the first to realize the enormous lighting potential that lay in modern architecture's vast expanses of glass. Reflective and dark during the day, these surfaces could become entirely transparent and thus invisible at night. Skillful lighting would reveal a building's spatial depth and complexity.

Kelly's "nocturnal modernity" came to define the imagery of mid-century Modernism. No wonder that modern architects were eager to work with him, be they Philip Johnson (who had discovered his talent), Ludwig Mies van der Rohe, Eero Saarinen or Louis Kahn. Kelly insisted on being consulted early on in the project, and would often have substantial influence on the final design. The lobby of Mies van der Rohe's Seagram Building in New York would be polished dark green marble today, if Kelly had not talked Mies into using bright travertine instead which became a crucial element in the building's luminous presence on Park Avenue.[6] The ingenious daylighting of the Yale British Art Center and the Kimbell Museum in Fort Worth, Texas were also Kelly's creations.

Lit from Within

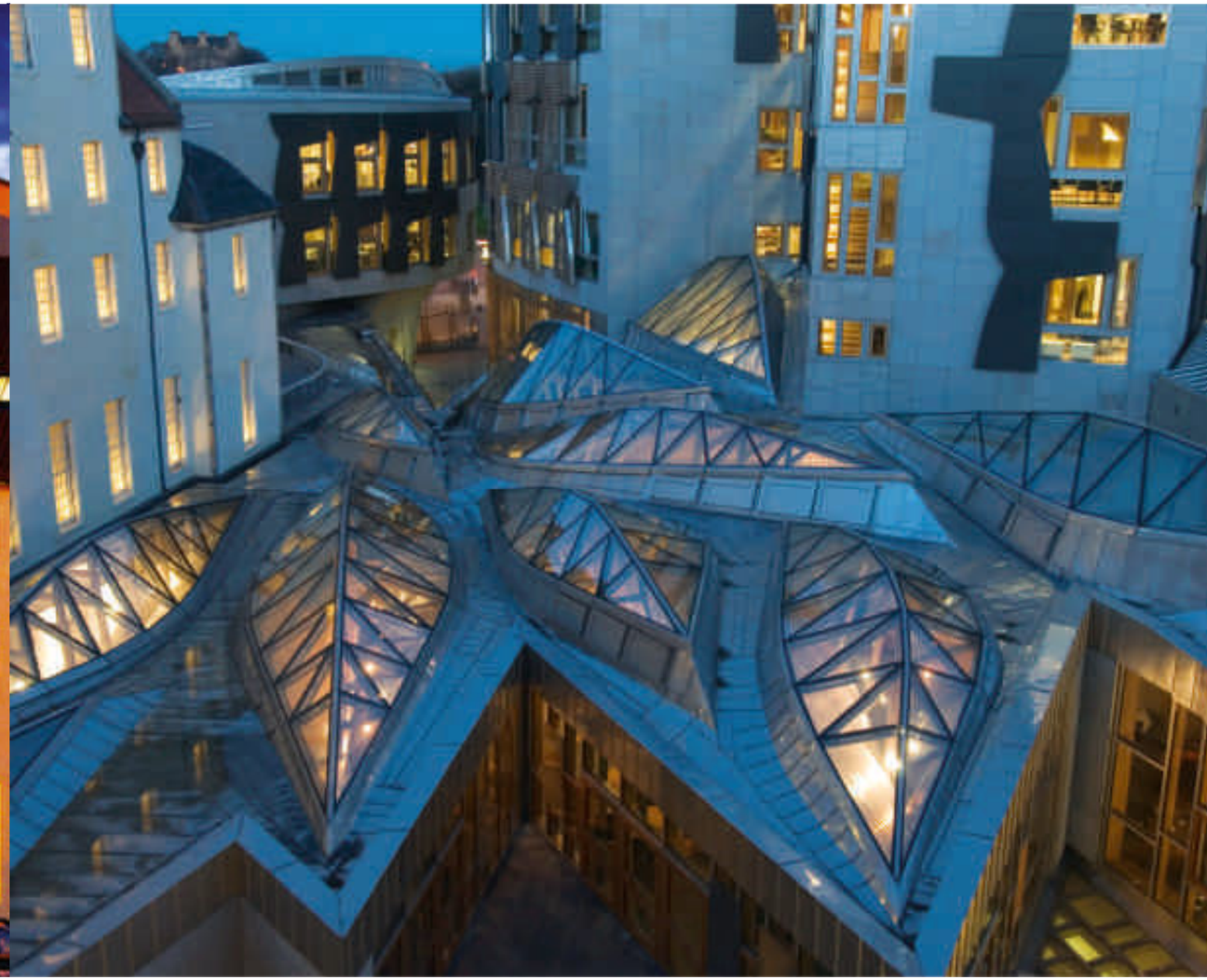
Throughout the Parliament, nighttime lighting emanates from the interiors of the buildings. The articulation of windows and skylights becomes a crucial visual component, anchoring the composition and defining the exterior identity of the complex at night.

Windows are grouped to form a geometric, shifted-grid pattern on the interior courtyard façade of the Members of Scottish Parliament (MSP) building. Diagonal downpipes silhouetted against the lit offices add to the façade's liveliness. In contrast, the adjacent historic Queensberry House is demurely lit with uplights embedded in the restored windowsills.

Leaf-shaped foyer skylights, an echo of the project's signature leaf-like building volumes, extend the site topography to slide between buildings. At night, the glazed surfaces glow softly from miniature pendants suspended within, generating elegant, luminous shapes in the landscape.




Opposite: East façade of MSP building and Queensberry House
Above and below: Foyer skylights at dusk



black

silver piper

black fixtures.

metal silver/grey

BLACK

GREY - ISH (grate + pipe)

6" sq.

coffer plan

Black out above

normal unfinished metal grate

8'-0" o.c.

12" x 12" x 16" wide

drywall edge

(See 3rd floor for clg this area)

shadow reveal @ metal box

Solid ceiling material (steel or wood) TBD
Ltg in reveals in between @ 7'-0" o.c.

painted to above.

a) ltg
b) sprinkler
c) power

finished black interior

6-8"

30°-45°

6"

MR16

5' grid of coffers

drywall edge

drywall liner

6'

drywall

drywall

24"

concrete outside

precast concrete edge

concrete

drywall

5'-6"

black

+4'-6"

4

REFLECTED CEILING PLAN
2ND FLOOR
SCALE 1/16" = 1'
21-05-00

Bergisel Ski Jump

Innsbruck / Austria
Architects: Zaha Hadid
1999-2002

The Bergisel Ski Jump is part of an Olympic arena refurbishment for the Austrian city. An international sensation at the time, the architectural design of the structure is a hybrid between a tower and a bridge. Combining a highly specialized sports facility, café, public viewing terrace, and access elevators into a single sculptural element, it extends the topography of the slope towards the sky.

Dramatic lighting makes the 50 m (164') high structure stand out against the backdrop of the Alps at night. A glow of colored light radiates from the jumper's starting point and accelerates down the ramp, hinting at the structure's sports function. Seen from downtown Innsbruck, windows surround the top of the structure and form a luminous slice. Silhouettes of activity in the top-floor restaurant and viewing gallery are revealed within.

During evening ski events, a specialized set of lights is activated. Multi-lamp luminaires line the sides of the ramp, providing optimal lighting conditions with minimal glare. This allows athletes to evaluate minute variations in the snow surface to perform at top speeds.

In collaboration with the architects, finishes were selected to enhance the natural lighting of the ski jump. The structure is clad in brushed finish metal panels which catch daylight and provide a smooth gradation of light and shadow to sculpt the form. This was chosen over a mirror-polished finish, which would have produced flashes of reflected glare.

Opposite: The iconic gestural sweep of the ski jump is brilliantly illuminated, making the structure visible at night from surrounding areas.

Signature Color

The Times Square District has specific requirements for illuminated signage and overall surface areas that must be illuminated. Many of the area's buildings meet these requirements by using bright façade lights and animated signage boards.

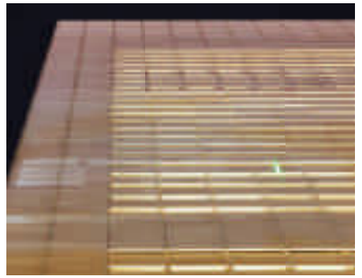
Inventive lighting strategies are used to support The New York Times Building's image of prestige and elegance while also respecting the Times Square District requirements. Instead of brash floodlighting, the building is lit in a subtle manner that plays up the transparency of its screen façade. By utilizing the reflectance value of the building's off-white ceramic rods, the scheme also saves power, while appearing to achieve similar light levels to adjacent buildings.

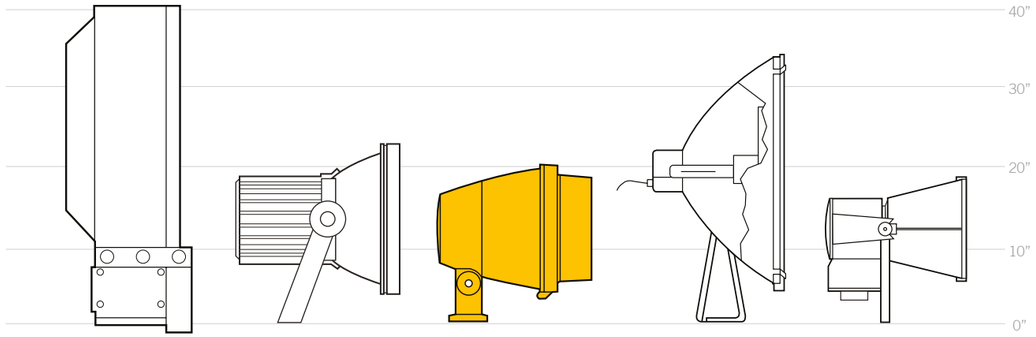
Rather than deploying typical illuminated signage boards to generate visual interest, select luminaires are custom painted "taxi-yellow", echoing the cultural context of midtown traffic. This color is a first-of-its-kind finish for luminaires normally only found in black, white and gray.

Opposite and below: Times Square District at day and night

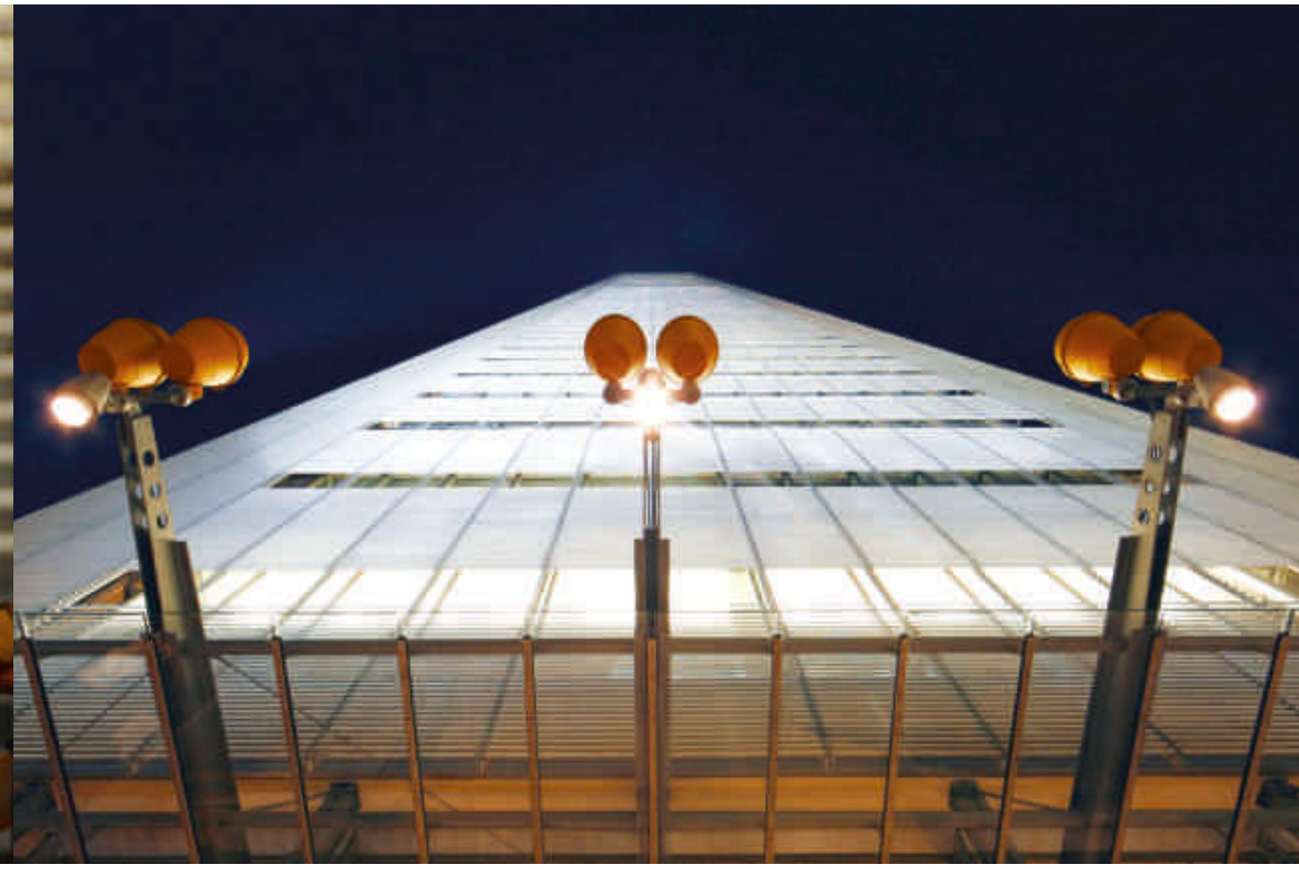
Laser Aiming

Exceptional for a building of this size, floodlighting is achieved with a single family of luminaires and one lamp type. Luminaires equipped with metal halide lamps pair with varying optical systems to create the inverted, 261 m (856') wall wash effect. The top of the building is lit by luminaires with narrow beam optics that give a long throw of light. Mid-levels receive illumination using narrow beams with spread-lenses. Finally, wide floods cast light on the base of the building. The luminaires are precisely focused using laser aiming devices, and locked in place once adjusted.





Opposite: Laser aiming of luminaires to pre-determined façade locations
Above: Exterior product evaluation
Below: Luminaires cast light up the 261 m (856') façade



The United States Air Force Memorial

Arlington, Virginia / USA
Architects: Pei Cobb Freed & Partners
2002-2006

Situated on a promontory overlooking the Pentagon, the United States Air Force Memorial takes its place in the ranks of the capital city's key monuments. Lighting is an essential aspect of establishing the nighttime identity of each of these structures. At the Air Force Memorial, three stainless-steel spires evoke the precision and weightlessness of flight. Illuminated with a variation in intensity, the sweeping curves of the arcs are accentuated, and their tips brilliantly lit. Illumination appears to emanate from within the monument itself, gliding along the slender forms and bursting into the night sky.

Lighting for the memorial is a highly technical challenge. Each spire has a different-sized triangular footprint, varying in proportion and height. Their surface area tapers dramatically to tips that are 23 cm (9") wide, and sway up to 46 cm (18") in the wind. Moreover, the convex contours of the arcs turn away from the center of the monument necessitating a peripheral lighting strategy.

An additional challenge is posed by the monument's location on the commercial flight path to Ronald Reagan Washington National Airport. To meet Federal Aviation Association (FAA) requirements, red beacons would typically be placed at the tip of each spire, to alert approaching pilots. Upon a close reading of the guidelines, a creative interpretation allowed for the upper portions of the spires to be brightly lit to aviation regulation levels, as an alternative to the red beacons.

Luminaires concealed behind granite walls provide the primary lighting for the monument. The lights have precise narrow beams, deep-set optics and integral cross baffles to minimize potential glare for pilots. Additional luminaires near the base of the spires are cleanly detailed into the granite paving. Instead of an even wash of light, the overall illumination brightens in a calibrated gradient to subtly accentuate the base and curving tips.

Granite inscription walls flanking the spires are lit by in-grade wall-washers, housed behind custom-fabricated stainless steel hoods that minimize glare and match the material of the spires. In the central viewing area, oversized glass pavers in the form of an Air Force Star logo are backlit by LEDs, that generate an ambient glow of light.

To meet the National Capital Planning Commission's and Fine Arts Commission's exacting standards, the project's rigorous technical lighting requirements are balanced with its overall aesthetics. Longevity, ease of maintenance, and meeting FAA requirements were important considerations in developing the lighting design to ensure that the lighting will uphold its performance and appearance over time.

Opposite: Lighting accentuates the sculptural forms of the monument's slender spires, reinforcing its elegance.

Below: Installation of streetlight prototypes
Opposite: Daytime view of streetlight prototype
Following spread: Nighttime view of streetlight prototypes

The first of its kind

The apparent simplicity of the streetlight design belies its technical complexity. Even the support pole has multiple design features and requirements: slight tapering over its 9 m (30') height slims its appearance while maintaining an indiscernible conical shape that provides increased structural stability. As the pole connects to both the luminaire housing and to the base of the streetlight it becomes the dimensional setting out point and the tolerances must be exacting.

Distinguished from other LED streetlights that have appeared on the market since the groundbreaking design, the Citylights streetlight has undergone rigorous testing and prototyping to meet the stringent requirements of New York City's Department of Design and Construction, Department of Transportation and Public Design Commission—a process that assures the quality and performance of the streetlight. The resulting streetlight's sleek form is entwined with state-of-the-art lighting technology and is poised to illuminate streets, sidewalks, and parks within the five boroughs of New York.

King Abdullah Petroleum Studies and Research Center (KAPSARC)

Riyadh / Saudi Arabia
Architects: Zaha Hadid
2009-

Situated in Riyadh, the King Abdullah Petroleum Studies and Research Center (KAPSARC) is a global center for international energy analysis, environmental research and policy studies. The overall site exceeds 500,000 m^2 (5,000,000 ft^2) and consists of multiple buildings including a research center, conference center, musalla (prayer room), IT center and research library. The complex also includes shaded outdoor spaces, courtyards, gardens and open atria woven together by an open-air central plaza, known as the Place of Icon.

The architectural design features a series of interlocking, cellular structures—dune-like forms rising from the desert landscape. Hexagonal in plan and section with varying heights, these structures encompass of a multitude of different architectural elements including folded ceiling planes, hexagonal skylights, open atria, canted walls, triangulated niches, sloped ceilings, and shard-like panels that wrap walls and ceilings. Both the interior and exterior spaces are highly atypical and asymmetrical, having no right angles or identical sections.

An overall lighting design logic was critical to visually unify the diverse buildings—ranging from administrative and gathering spaces, to auditoriums and a worship hall and reinforce the avant-garde architectural aesthetic. Lighting is utilized throughout the complex to emphasize angular geometries, while being completely integrated to become an extension of the architecture.

Innovative lighting strategies also support the facility's agenda as a global sustainable energy research center. A lighting masterplan of energy efficient and sustainable solutions throughout the complex help the project meet its LEED Platinum goal, a first of its kind in Saudi Arabia. The overall control strategy employs a digitally addressable lighting interface system, zoning controls, dimming capabilities, daylight and occupancy sensors, and energy monitoring software capabilities. These allow for a holistic, integrated scheme for energy efficiency that balances the overall quality and brightness of artificial lighting in relation to usage and natural daylight.

At night, a choreographed play of light and shadow accentuates the multi-faceted geometry of the façades, supporting the complex's iconic visual character. Lighting for the Place of Icon—a luminous focal point—visually connects the buildings and radiates into the vast landscape.

Opposite: Rendering of the KAPSARC complex with its distinctive angular geometry.

Interiors

Research Center

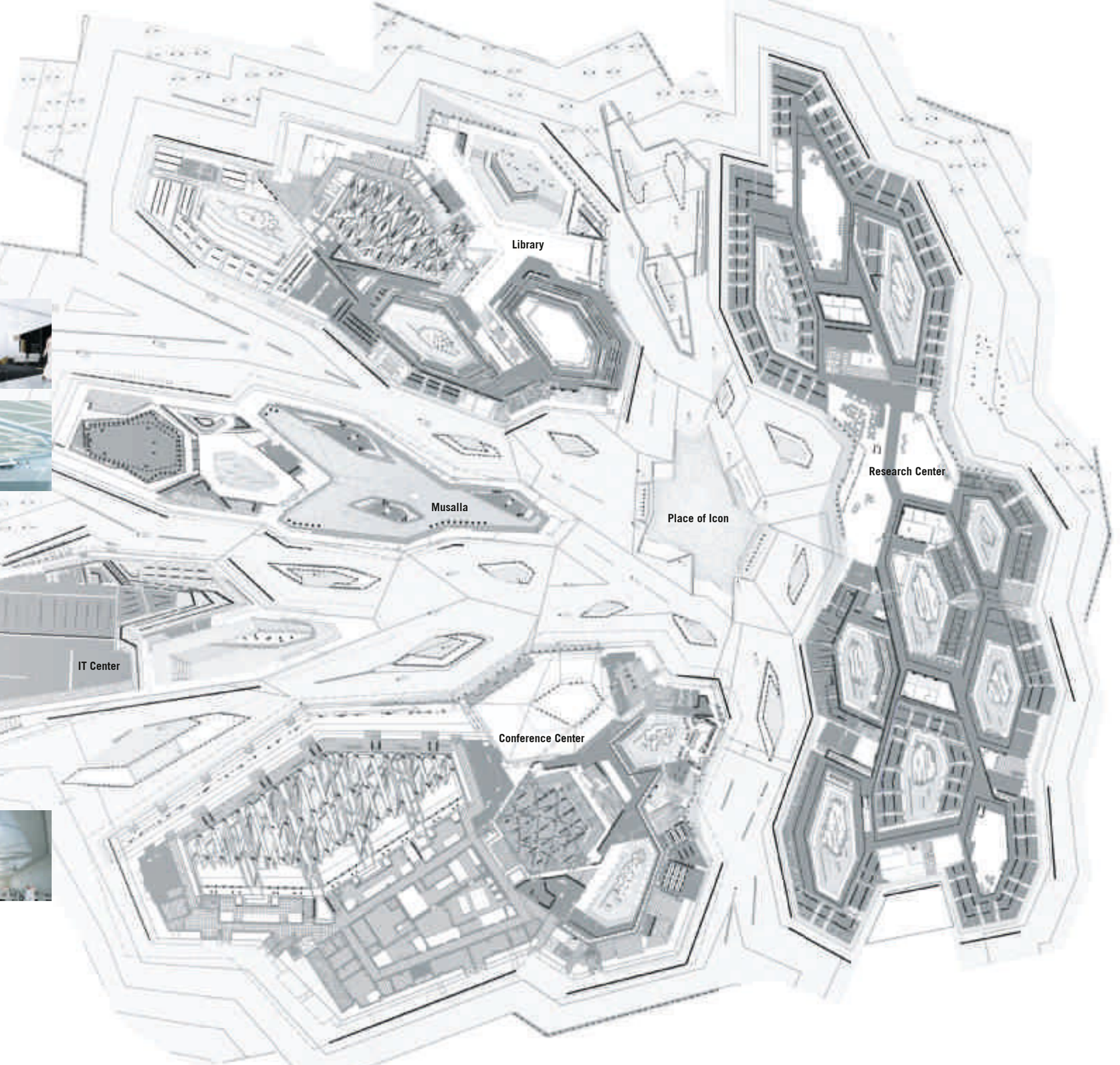
Library

Place of Icon

Musalla

IT Center

Conference Center



The Rookery

Chicago, Illinois / USA
Architects: Daniel Burnham and John Wellborn Root

1888 - Original building
2011 - Exterior lighting

The Rookery is a milestone in American architecture. Designed by Daniel Burnham and John Wellborn Root and completed in 1888, its masonry is supported by a steel frame—an innovation in construction at the time that allowed the building to achieve the unprecedented height of twelve stories.

Added to the National Register of Historic Places in 1970 and designated a Chicago Landmark in 1972, The Rookery is now considered one of the greatest surviving examples of early commercial skyscrapers and Chicago's oldest standing high-rise. Its stately dark red brick and terracotta façade with elaborate masonry is unmatched in architectural detailing. This is complemented by a rich and inviting environment within the building, with architectural features including a mesmerizing oriel staircase and stunning light court.

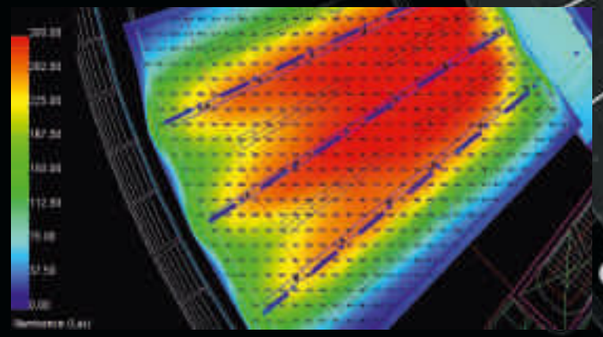
The Rookery makes history again as nighttime lighting graces its façade for the first time in the edifice's over century-long history. Previously, the building's distinctive dark red color made it visually "disappear" at night, especially when compared to the lighter colored buildings nearby. Lighting now softly activates the intricate masonry carving, giving the structure an elegant nighttime presence and distinguishing it from its neighbors.

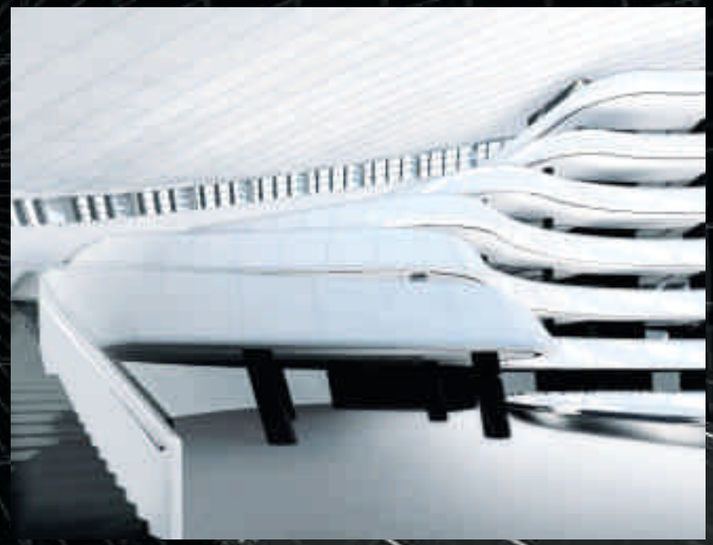
Upon a close look one notices the building is not 'floodlit' which would flatten it's appearance, but instead the façade is grazed with a veil of illumination that catches the undersides of windows and ledges, enhancing the architectural beauty and texture of the building.

The historic building is illuminated solely with LEDs—the most advanced state-of-the-art lighting technology available.

Developed in close collaboration with the client and the Chicago Landmarks Commission, the exterior lighting design creates a subtle presence of brightness, shadow, and contrast that renders the building visible without overpowering it with light. By activating the façade with a soft veil of illumination, The Rookery's distinct character and historic integrity are respected and maintained.

Opposite: Illumination from window sill-mounted LEDs grazes up The Rookery's façade, highlighting its masonry details.





On the upper levels, micro-scale luminaires are arranged in radiating bands that also integrate speakers and sprinkler heads. State-of-the-art technology allows a thin, 50mm luminaire profile to provide light levels for work areas. Spacing between the radial bands is coordinated architecturally and photometrically to provide sufficient light levels, while accommodating service equipment and aligning with the building's structural modulation.

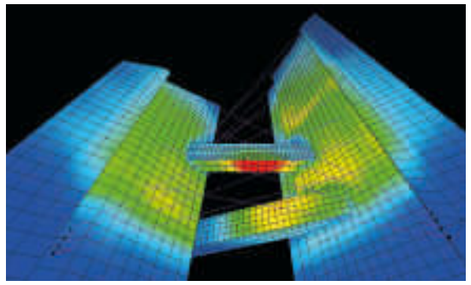
Above: Office renderings and light calculation diagram
Opposite: Lobby rendering; reflected ceiling plan at typical floor

Scale-like façades

At night, the scale-like façade of the towers are enlivened with illumination. A series of exploratory lighting strategies for the exterior included emphasizing the mega-columns and accentuating the textured cantilevered volumes.

Playing on the building's identity, LEDs allow the building to 'breathe' in different colors for special events, changing from white to fire-like amber hues and cool, blue-green tones. Articulating the shingled façade produces a distinctive appearance from a distance and generates a unique visual experience of the dragon-scale building skin.

Right: Close-up of glass façade
Left: Lighting diagrams showing white and colored options
Below: Rendered view of towers from above; lighting calculation



Jean Sundin and Enrique Peiniger founded Office for Visual Interaction (OVI) in 1997. Based in New York City, the office specializes in architectural lighting design for signature projects worldwide.

Born in the United States, Jean Sundin received her B.F.A. in Interior Design from Virginia Commonwealth University, where she studied under Han Schroeder and graduated magna cum laude. She later joined the lighting office of Claude and Danielle Engle, and as a project manager contributed to internationally acclaimed works including the Carée d'Art in Nîmes, France; Stansted Airport in Essex, UK and the Grand Louvre in Paris, France. Jean's lighting design experience and technical expertise allow her to use light as a technical extension of the architectural language to shape and transform space.

German-born Enrique Peiniger received his Diploma in Architecture and a Masters degree in Social Science from the Technical University in Berlin. He worked in the lighting design studio of Christian Bartenbach in Austria and later joined a lighting manufacturer to develop custom luminaires. Over the years he has cultivated an in-depth knowledge of luminaire manufacturing and technology, giving him the highest level of precision in designing lighting solutions that conform to narrow technical requirements. Enrique frequently spearheads collaborations with industry to develop custom luminaires, incorporating specialized finishes, innovative manufacturing techniques, and emerging light sources.

OVI's unique work process and holistic approach to lighting design were recognized early on, with major commissions including lighting for the Scottish Parliament in Edinburgh, Scotland. As principals of OVI, Jean and Enrique have been responsible for iconic lighting work around the globe, ranging from masterplans and cultural buildings to sophisticated interiors and product design.

Parallel to their lighting design practice, they are both active Professional Members of the International Association of Lighting Designers (IALD), the Illuminating Engineering Society of North America (IESNA) and the Professional Lighting Designers' Association (PLDA). During Jean's tenure as Director of Education for the PLDA, she established the *'Architectural Lighting Fundamentals',* a set of universal benchmarks for lighting education, and chaired the committee for the development of a syllabus for a Masters Degree in Lighting Design. She has been an invited judge for the IALD Lighting Design Awards, IES Lumen Awards and AIL Magazine Awards. Jean and Enrique are co-authors of the IALD *'Guidelines for Specification Integrity'* used by lighting designers worldwide. In 2004, Enrique was appointed a UNESCO expert and later served as Treasurer for the PLDA. In addition, he has served on the program advisory committee for the IALD – Enlighten America conference.

Jean and Enrique have been internationally recognized for their technologically and aesthetically inventive lighting design solutions. Their work has been honored with the industry's highest accolades, including the General Electric *Edison Award*, Architect Magazine's *R&D Award*, the Illuminating Engineering Society *International Award of Distinction* and multiple *Lumen Awards*, the IALD *Award of Merit,* the American Institute of Architects' *Project Merit Award*, the New York Arts Commission *Award for Excellence in Design*, the Illumni *Gold Infinity Award*, the LAMP *First Place Award for Architectural Outdoor Lighting* and the World Architecture News *Lighting Project of the Year*.

Their work has been featured on national television and in leading international architectural, design and lighting publications. In 2010, the work of OVI was showcased in the first solo lighting exhibition at the renowned Architecture Forum in Berlin, entitled 'Lighting Powers of 10'. Jean and Enrique have both led advanced courses in lighting design and are frequent lecturers worldwide. Presentations have included the keynote at Neocon in Toronto, the Richard Kelly Lighting Symposium at Yale University, Universidad Politécnica in Madrid, Lightfair, Light + Building in Frankfurt, PLDC conventions in Berlin, London, Madrid and the Euroluce in Milan.