

# LIGHT IN THE PUBLIC REALM

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## ABSTRACT

In order to address daylight as a meaningful presence in the urban context, light needs to be understood as a public resource and one that offers a collective engagement with, and biological connection to nature.

All those who contribute to the built context of our daily lives might well have a host of ideas about design quality and purpose, but how often do they consider the essential place that our experience and perception of light plays in our lives? Do they consider our dependence on a temporal sense of light, both diurnal and seasonal, both to our physiological and psychological health?

Our interest is not so much a didactic approach to providing proven intensities or durations of light necessary to human health. We collaborate with engineers and scientists to have our work embody this knowledge, however our goal is more a poetic and aesthetic approach to place making. Consequently the potential is for design that articulates a powerful sense and perception of light within the very building fabric that makes up the public realm, whether it be in the design of curtain walls or street furniture. At every scale of design there is an opportunity to articulate the presence of light and to unpack the dense information contained within light.

*Keywords: Light, Glass, Public Realm, Spaces Between*

## 1. INTRODUCTION

As a designer and artist with more than forty years of technical and aesthetic experience, this paper takes a poetic approach to the subject of Light in the Public Realm. Light has been a profound interest of mine on several levels: that of the artist's observation and contemplation of nature; the film maker's intuitive understanding of light as a medium capable of transmitting information; that of the glass expert's knowledge of material structure and its relationship to light; and finally of the designer's deep interest in public spaces and how the built environment impacts access to light, both quantitative and qualitative. This paper outlines some examples of my studio's design projects and makes the case for an approach to design, including product design that seeks a highly technical and functional yet interconnected, timeless and lasting approach to an aesthetic solution.

## 2. COLLAPSING/EXPANDING PERCEPTION

The evolution of human perception and communication is an ongoing dynamic process that shouldn't be taken for granted. One aspect of the defining human drive to transform observation into symbols could be thought of as shaping the public realm. From pyramids to billboards, the symbols we deploy create a dialogue between our personal experience of our environment and the collective language we use to define it. Controlling the dissemination of symbols has long been a defining feature of culture and those invested in influencing its narrative framework. Through human history, the accelerating process toward the primacy of symbols appears to have reached a logical conclusion as observation, dissemination and consumption of symbols has become concentrated literally and conceptually within the frame of our mobile devices. Today, it may be that the act of perception is dominated by our mobile devices, this entirely symbolic experience of light eclipsing every other kind.

### 2.1 Light and Materiality

Light is both material and perception. Our universe, and its physical embodiment as we understand it, began with the big bang, while our conception of it occurs to an extent through the observation of light and other forms of energy resulting from the big bang.

Most discussion about light in the public realm is framed through the opaque and transparent materiality of surfaces. We believe that there are greater design opportunities for the public realm when opacity and transparency are framed as light in relationship with materiality – a focus that gives greater importance to the space between ‘things’. Light, in its every interaction as it is diffused, refracted, diffracted, absorbed or reflected, is conceptually accumulating information that is constantly, if subconsciously, informing us and connecting us to a more transcendent experience of nature. The designed world is no less important as it must consider the impact of ‘things’ far beyond their physical boundaries.

## **2.2 Transparency and Architecture**

The meaning of transparency in architecture has been conceptually framed as evolving first as a void within an opaque enclosure and then as a translucent and eventually transparent continuation of the enclosure before being conceptually expanded to include views through the mass of a structure implied by its form [1]. Today I would argue the concept of transparency, literal, and implied has fully shifted to our mobile devices – a window on the world, but one consisting of light entirely mediated by human symbols. Though this window exists in a physically dematerialized architecture, the glass threshold of our devices, and its rather literal association with architecture, is consistent with the idea of transparency in architecture in the modern age. The ignored materiality of glass may also be a conceptual framework by which we can pivot from the narrow frame our glass fronted devices and reconnect with a much more expansive experience of light.

### **4.1 Glass and Environment**

The glass on our mobile devices is itself entirely ignored just as the glass progressively defining the public realm is ignored. And yet the dark face of our mobile device could be observed, especially when at rest, to be a mirror reminiscent of polished obsidian surfaces, some 6000 years old [2]. Such objects would have themselves been considered a product of high technology – creating these flat reflective surfaces using a natural glassy material can be thought of, at least in retrospect, as the beginning of a linear progression to the extraordinary properties developed for industrial glass production today. What we are missing is the awe necessary to appreciate, and therefore harness, the properties of glass. The dark reflected image of the obsidian mirror may have been a near magical object, its reflection a source of wonder and contemplation. These properties are inherent in glass, as is the opportunity they offer for the public realm.

## **3 CONCEPTUAL FRAMEWORK**

The properties of glass are rich with both literal and phenomenal properties, simultaneously presenting a multitude of optical and emotional responses, but beyond visual observation, glass and its simultaneous embodiment of light can define a conceptual framework to reframing light in the public realm as an experiential presence.

### **3.1 Aesthetics and Performance**

From before Isaac Newton [3] and beyond Richard Feynman [4] theories about the properties of light continue to push the limits of human imagination – to such an extent that light is more mysterious than any metaphysical or religious philosophy.

Bruno Taut, [5] Paul Scheerbart [6] and others articulated forward looking, utopian visions of glass as the essential element of the designed world – one founded on pure color and light. In our post-modern age, the greatest opportunity offered by glass is its simultaneous embodiment of aesthetics and performance – a meshing of art and science as concisely envisioned by Mike Davies’ Polyvalent Wall [7]. Through the material’s formulation, production methods and treatments, the material has an almost infinite number of properties. This allows for a high level of artistry which itself demands a clarity of purpose, one that, by its very aesthetics, is responsive to performance needs and requirements of occupiable and habitable space.

### **3.2 Light in the Public Realm**

The language of glass materiality is useful in a conceptual design approach to product design as much as the public realm. All materials and material treatments can at some level be explored for

their ability to transmit, refract, diffuse, absorb and reflect light – and thereby reconnect us with the presence of nature within the public realm. The simultaneous and layered possibilities of glass may be exceptional but with a rigorous knowledge of materials and their optical properties there is always an opportunity to better reveal light in the public realm with combinations of materials and treatments. A clarity of purpose is defined first by observation, a largely, if not exclusively optical process defined by specific characteristics of light. This observation leads to the identification of the defining characteristics of a place. Any addition to the public realm has the responsibility of harnessing those unique characteristics with the greatest economy of means. By developing structures that embed optimized native optical transpositions of image and light information, the deeply engaging experience of a particular ecology and urban context can be preserved or reclaimed.

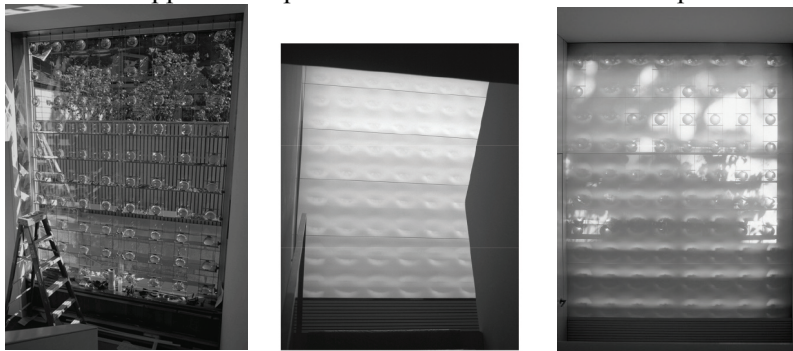
### 3.3 Collaboration

Collaboration as an intrinsic way of building performance into formal and aesthetic design procedures.

Driving attention away from the symbolic light of our mobile devices, which narrow our sense of place to an entirely cultural and symbolic landscape, and instead redirecting it to the star light that informs the physical world, both its specific local characteristics and its connectedness to the universe. Collaboration demands an open mind as well as core conceptual foundation upon which to direct the more wide ranging exploration of design opportunities. Whether consumer product or city planning, design must consider factors that only a collaborative process can elucidate.

## 4 PROJECT EXAMPLES

From artworks at a range of scales, to landscape interventions, to the lead design of a national museum, these examples demonstrate a variety of responses informed by the approach outlined above. To reiterate, the key is an overarching concern with the space between the objects and buildings of the designed world. Designers should be considering how to support public space and how this space in turn can support an expansive human connection to the presence of light.



*Figure 1. 2. and 3. Installation of artwork – a window on the neighboring fence and property become a responsive device*

### 4.1 Periscope Window

The Periscope Window, Figure 1, was commissioned in response to a window view blocked by the immediately opposite neighboring property. Working in close collaboration with architect, VJAA, the artwork transforms the experience and expectation of a window view by selectively revealing tree shadows layered with upside down pinhole and lensed projections of trees and sky, some of which are reverted by mirrors. The exchange of ideas among the studio's cross-disciplinary mix of artists, architects and engineers engages each design with a simultaneous addressing of performance, craft and light concept.

The Periscope Window redefines the singular idea of the window, as prescribed by its frame, and instead extracts light that exists in the environment well beyond the window frame's limit. The result is a highly responsive and richly textured layering, Figure 2 and 3, of variously scaled phenomena which dynamically represent the depth of information found in light.

## 4.2 Lens Ceiling

Commissioned to design the ceiling for the Special Proceedings Courtroom of the new Sandra Day O'Connor Federal Courthouse in Phoenix, JCDA proposed the Lens Ceiling as not only a public artwork, but also a part of the architecture. Designed by Richard Meier and Partners, the courthouse is almost entirely built of glass, Figure

4. The piece sought to enhance the theatrical nature of the space while acting as a multi-functional building component: an acoustic barrier; a daylight and artificial lighting system; and a functional support for the fire and life safety system.

With a work so seamlessly integrated into the architecture, and with safety considerations paramount, collaborating with architect, Richard Meier & Partners and engineers, Ove Arup & Partners was essential to the design process.

The spherical area of glass is diffused, creating a luminous sculptural element that captures the sky and the shifting shadows of the building's structure without distracting attention from the proceedings in the courtroom. The various laminated glass panels, provides a thermal, acoustic, and dust barrier for the courtroom space.



*Figure 4. 5. and 6. The Lens Ceiling encloses the cylindrical glass courtroom and is founded on merging performance, structure and light*

The central lens area acts as a precise diffuser for the artificial lighting mounted at the top of the drum, while the clear horizontal perimeter ring of glass visually frames the lens and allows views of the sky from the public viewing gallery. JCDA also designed an innovative solution for the mandated sprinkler system, Figure 5, fabricating the sprinklers out of stainless steel and integrating them as working members of the cable-net tension structure.

The Lens Ceiling presents a delicate, suspended spherical form intersecting a horizontal plane, as if a bubble of air were resting gently on a surface of water. The courtroom, Figure 6, is informed by the contemplative presence of light.

## 4.3 Midway Crossings

The mile-long eighty acre Midway Plaisance Park divides the University of Chicago into north and south campuses, resulting in a sense of separation between the two. The Midway Crossings, Figure 7, establish a more coherent and engaging connection between the two areas of the campus by marking the three main cross-Midway streets that now serve as the student vehicular and pedestrian links.



*Figure 7. and 8. View of one of three Midway Crossings and detail illustrating how light is revealed as a presence embodied within the functions of the crossings*

The Midway Crossings also highlight the park's plan which links the campus to the luminous qualities of Lake Michigan to the east and Washington Park Lagoon to the west. The interventions provide a sense of continuity between these campus areas, the park and the bodies of water, by merging lighting, seating and materials to create a bridge-like experience for pedestrians on the street and those within the park.

The 16 stainless steel light masts at each Illuminated Bridge, Figure 8, establish a strong presence of the sky during the day, while at night internal illumination provides pedestrian lighting and signals safe passage across the park to those near and far.

The Midway Crossings activate the public outdoor space at both the macro scale of the Midway and campus plan and at the micro scale of the pedestrian. At both these scales the insertion of the 'bridges' speak to the historical significance of the site, originally designed and planned by Frederick Law Olmstead - his design had a canal linking Lake Michigan to the inland lagoon. The existing length of the park spans these two water features and although the excavation began at the time, it was never completed. The excavated sections are now well used as sunken playing fields while the cross-streets remain at the higher elevation. This new plan both shelters and reinforces the visibility of the popular playing fields while the Midway Crossings mark the passage across the park and emphasize a sense of the light reflected in water that would have defined Frederick Law Olmstead's original plans for a canal.

As an artwork, the studio's collaboration with Skidmore, Owings & Merrill, the architect that developed the university's master plan, was essential in realizing a light-based articulation of this urban infrastructure. This project was also an example of working across disciplines, harnessing technology developed and perfected over decades by the fabricators of industrial filtering – welding prism stainless steel wire progressively rotated with a level of control that would be otherwise cost-prohibitive. This industrial technology was combined with light pipe technology used in lamp fixtures, the two tuned to create specific qualities of light, both providing functional yet comfortable lighting.

#### 4.4 Israel Museum, Jerusalem

The five-year expansion and renewal of the Israel Museum's 20-acre campus was to reorganize the campus plan and poetically moderate Jerusalem's intense natural light within new, innovative all-glass pavilions. A sequential and engaging experience of subtle light effects provides intuitive wayfinding, enhancing the visitor experience of the Museum's art, architecture, and surrounding landscape.

The Israel Museum's campus enhancement project, Figure 9, was designed to resonate with the original design vision of Alfred Mansfeld and Dora Gad, infusing light and a clarity of circulation into a built environment that had changed tremendously since its opening in 1965. JCDA designed 95,000 square feet of new construction, including three Entrance Pavilions standing at the front of the campus housing ticketing, restaurant, and retail, a main Gallery Entrance Pavilion providing centralized access to the Museum's main galleries, and a major below-ground Route of Passage that connects the two parts of the campus.



*Figure 9. 10. and 11. The all-glass buildings are light instruments deeply connecting visitors to their sequential passage through the museum campus, moderating heat and glare while embodying views and light within the building envelope*

The structure and form of the four new glass pavilions, created to support visitor circulation, echo the modernist geometry of the Museum's original buildings. At the same time, the pavilions provide a visual counterpoint to the stone-clad facades of the original buildings, which present the Museum's collection and exhibitions. Each glass pavilion is enclosed by terracotta light-redirecting louvers designed to transmit a sense of the exterior landscape into the buildings while entirely blocking the transmission of direct light.

Captured on the interior plane of the louvers, Figure 10, a continuous play of light, shadow, and color is broadcast by the louver geometry. As visitors transition through the Entrance Pavilions at the front of the campus, they may reach the galleries either by ascending the Museum's refurbished Carter Promenade or by entering the new Route of Passage, situated directly below the promenade. Leading visitors to the heart of the Museum, this below-ground transition is designed as a luminous and active visitor experience. The route, Figure 11, is flanked on one side by a light slot revealed behind a continuous translucent glass wall. Enclosing the light slot above is a prismatic cast glass water-feature running along the Carter Promenade's walkway. Water-activated light projected into the light-slot is distilled by the 426 foot long translucent glass wall into a mutable expression of the sky sweeping across the campus. The sound of the bubbling water combined with the performative effects of the light create both a visual and aural connection between the below-ground Route of Passage and the exterior landscape of the Museum.

The Route of Passage brings visitors into the lowest level of the Gallery Entrance Pavilion. The Gallery Entrance Pavilion provides vertical circulation to the Museum's three collection wings and temporary exhibition galleries on its main floor, while also allowing visitors to reach Crown Plaza at the campus' highest point. All of elements of the museum design speak to an experience of progression, both literal and psychological. The physical architecture is a device that both intuitively guides visitors through the museum, and emotionally engages them with a collective and uniquely local experience.

## 5 CONCLUSION

Design at every scale needs to push beyond a primary concern with designed objects as insular self-referential points of focus. Instead of materiality and light being conceived as vectors of symbolic output, as represented by today's most representative design object, the mobile device, product and other fields of design, could be reconceived as the opportunity to expand perception outward and address daylight as a critical and meaningful presence in our daily lives.

As the properties of light continue to be researched, their mysteries only seem to further stretch our imagination. Meanwhile the physiological role of light is being researched and determined to be very specific in its role in human functioning which can be measured through indicators of human health. As designers, collaboration with other areas of expertise is key in harnessing the simultaneously scientific and aesthetic potential of any project. Instead of measuring the success of design by the symbolic etymology of mobile device and connectedness to the internet, there may be a growing public desire to measure design by its performance – performance that encompasses function and the ability of the design to support an outward experience of life, a connectedness to the physical, un-mediated reality in which we live our lives. Even in the densest urban realm, there is always the opportunity for design that connects us with the most, profound, transcendent sense of that place and its connection to the universe – design that provides us with a collective sense of being.

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