

NATURAL LIGHT AS A MEDIUM FOR EMOTIONAL EXPRESSION IN ARCHITECTURAL DESIGN

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Abstract. Natural light shapes spatial perception and emotional response in architecture. Light and shadow enhance both form and atmosphere of architectural space. Case studies reveal light as a compositional and symbolic design tool. Regional analysis shows the underutilization of sunlight in Uzbek architecture. Daylight can improve design quality and reduce energy dependence.

Keywords: natural lighting, architectural perception, emotional design, daylight integration, spatial atmosphere, Tadao Ando, Louis Kahn.

Annotatsiya. Tabiiy yorug'lik me'morchilikda fazoviy idrok va hissiy munosabatni shakllantirishda muhim rol o'ynaydi. Yorug'lik va soya me'moriy makonning ham shakli, ham muhitini boyitadi. Holatli tadqiqotlar yorug'likni kompozitsion va ramziy dizayn vositasi sifatida namoyon etadi. Mintaqaviy tahlil shuni ko'rsatadiki, O'zbekiston me'morchiligida quyosh nuridan yetarlicha foydalanilmayapti. Kunduzi yoritish dizayn sifatini oshirishi va energiyaga bog'liqlikni kamaytirishi mumkin.

Kalit so'zlar: tabiiy yoritish, me'moriy idrok, emotsional dizayn, kunduzi yoritishni integratsiyalash, fazoviy muhit, Tadao Ando, Luis Kan

Аннотация. Естественный свет формирует пространственное восприятие и эмоциональный отклик в архитектуре. Свет и тень подчеркивают как форму, так и атмосферу архитектурного пространства. Анализ конкретных примеров показывает, что свет является композиционным и символическим инструментом проектирования. Региональное исследование выявляет недостаточное использование солнечного света в узбекской архитектуре. Дневной свет может повысить качество проектирования и снизить энергозависимость.

Ключевые слова: *естественное освещение, архитектурное восприятие, эмоциональный дизайн, интеграция дневного света, пространственная атмосфера, Тадао Андо, Луис Кан.*

Introduction

The thoughtful use of light in architecture emphasizes form, creates spaciousness, guides movement, and shapes expressive, dynamic environments through the interplay of light and shadow. Beyond aesthetics, light enhances well-being by improving mood, productivity, and circadian rhythms, while efficient lighting design supports sustainability by reducing reliance on artificial sources. In places like Uzbekistan, light serves both decorative and functional roles, blending tradition with modernity through features like carved screens and light patterns that regulate heat and illumination. Light becomes a powerful design tool, conveying atmosphere and meaning, from symbolizing the divine in sacred spaces to revealing form and texture in modern interiors, making architecture an interactive part of the human experience.

Main Body

Architectural techniques such as optimizing window placement, skylights, and reflective surfaces can maximize the transmission of daylight while minimizing issues such as glare and overheating. Future research in construction should integrate studies on the holistic impact of daylight to create design parameters aligned with the body's natural rhythms, ultimately promoting a healthier and more sustainable environment [1].

One example of how architecture can use natural light as a component of a building's emotional perception is Tadao Ando's Church of the Light (1989) in Ibaraki, Osaka. The simple form and striking cruciform openings of this concrete chapel transform sunlight into a central architectural focus [2].



Figure 1. Church of the Light, Tadao Ando

Natural light penetrates through the cross-shaped cut in the concrete altar wall, forming a moving cross of light that governs the dark space and draws the viewer's attention, creating a spiritual atmosphere. The visitor's path represents a transition from darkness to light. A 15° inclined concrete wall guides toward the entrance through a tall slit in the side wall, separating the mundane from the sacred. The interior is intentionally dark, with minimal windows. As sunlight passes through the cross, sacred shapes are projected onto the floor and walls throughout the day, turning static architecture into a living, evolving canvas. This light-and-shadow dynamic emphasizes austerity and concentrates attention on the altar (Fig. 1) [3].

Another outstanding example of how architecture can use natural light for emotional impact is the Kimbell Art Museum, which consists of a series of parallel cycloidal concrete vaults forming its roof. Louis Kahn designed the museum as a "family of rooms" with a simple, repetitive plan based on classical proportions. Six vaulted gallery rows are arranged in three sections, creating a spatial rhythm that is easy for visitors to navigate. This clear spatial order and monumental form reflect what Kahn called "Roman grandeur," seen in the vaults, arches, and porticoes inspired by classical architecture [4].



Figure 2. Kimbell Art Museum, Louis Kahn

Kahn envisioned the galleries as bathed in natural light, which he considered "the only acceptable light for works of art." Daylight enters through narrow linear skylights – "slots to the sky" – running along the top of each vault. Below each skylight is a curved perforated aluminum reflector that diffuses sunlight along the curvature of the vault and down onto the travertine walls. This system gives the concrete a "silvery glow" and creates soft, slightly shifting light that is ideal for viewing art. As the sun moves, the character of the light constantly changes. Kahn remarked that the museum "has as many moods as there are moments in time," and no two days are alike (Fig. 2) [4].

Movement through the museum is subtly guided by light: visitors instinctively follow the softly lit vaults or are drawn to the glow of an interior courtyard at the end of a gallery. According to Kahn, the structure and lighting of each room work in harmony so that one can “read the line of illuminated spaces” ahead [5]. Thus, light and space are inseparable – daylight animates architecture, and clear spatial organization enhances its presence, fully realizing Kahn’s ideal of a museum where “light is the theme.”

Another building where light is integral to its architectural ensemble and emotional impact is the National Assembly Building of Bangladesh – a monumental complex housing the country’s parliament. Designed by Louis Kahn in the 1960s and completed after his death in 1983, it is considered one of his greatest masterpieces due to its monumental scale and deep, symbolic use of light (Fig. 3).



Figure 3. National Assembly Building, Louis Kahn

A key design principle was the use of massive walls pierced with geometric openings – circles, triangles, and arches. These graphic forms define the facade and function as light filters [6]. From the beginning, Kahn viewed the project as a sculptural exploration of natural light, assigning it both a practical and philosophical role. He described the building as a system of “light-bearing volumes,” where walls serve not merely as partitions but as channels of light. This idea materialized in the building’s iconic openings. The exterior walls are punctuated with large circular, triangular, and arched apertures, glazed or screened, functioning as giant light receivers. They admit sunlight deep into the structure, casting dramatic light-and-shadow patterns. As one moves through the interlinked halls and corridors – what Kahn called “internal streets” – the sensation of flowing light alternates with zones of deep shade [8].

The National Assembly Building is one of the most expressive examples of architecture where light is an essential structural component. It modulates space,

creates a spiritual atmosphere, and transforms the concrete monument into a living organism interacting with time and nature. Critics have said that “being in the building is a cleansing by light”: “It is not just abstract – it is tangible. Light here is a sensory experience” [7].

Though still limited, there are examples of using the aesthetic and functional potential of daylight in Uzbekistan’s architectural practice. One such case is the Central Exhibition Hall of the Academy of Arts of Uzbekistan. Despite the abundance of sunlight in the region, modern buildings rarely employ natural lighting to enhance design and perception. However, some demonstrate successful integration of daylight into architectural solutions.

A notable example is the Central Exhibition Hall of the Academy of Arts of Uzbekistan, located in central Tashkent. Opened in 1974, it is one of the largest exhibition venues in Central Asia, with an area of 2500 square meters. Designed by architects Rafael Khayrutdinov and Farhad Tursunov and constructed between 1972 and 1974, the building combines traditional elements and modern approaches. The facade is adorned with national motifs and turquoise tiles reminiscent of traditional Uzbek ornamentation.

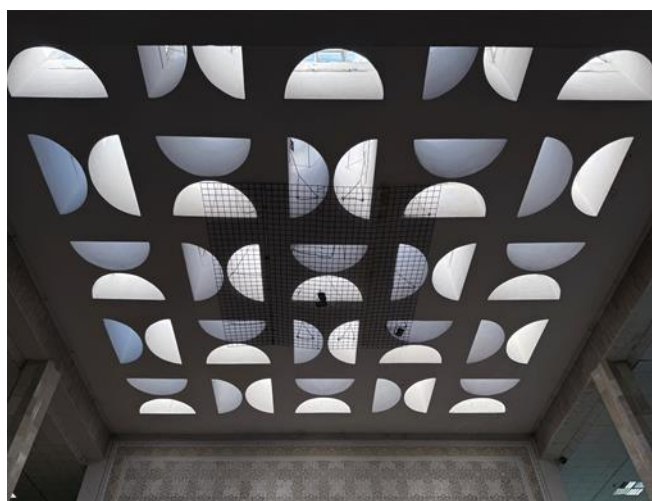


Figure 4. Central Exhibition Hall of the Academy of Arts of Uzbekistan, Rafael Khayrutdinov and Farhad Tursunov

The interior lighting is designed to maximize natural daylight. Ceiling windows distribute light evenly throughout the space, creating comfortable conditions for viewing exhibitions and highlighting the artistic features of the works on display. Simmering light creates soft ambience, similar to Kahn’s approach. This approach not only reduces the need for artificial lighting during the day but also creates a natural and pleasant atmosphere for visitors (Fig. 4).

Conclusion

Despite this successful example, many modern buildings in Uzbekistan fail to utilize the potential of natural daylight. This may be due to a preference for

standardized construction methods, insufficient attention to local climate conditions, or a desire to implement projects quickly without considering the architectural specifics of the region. Why do contemporary architects in Uzbekistan not fully embrace the benefits of abundant sunlight to enhance building design, comfort, and the thoughtful use of electricity?

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