

A STUDY OF LIGHT HIERARCHY IMPACTS IN MOSQUES: A CASE STUDY OF MASJID WAZIR KHAN, LAHORE

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ABSTRACT

Light has always been an icon of magnificent and mystical interplay with architectural spaces. Our built monopoly utilizes natural Light in such a manner that specifies meaningful experience to the spatial design. Light is a supreme element in Islamic architecture that symbolizes supremacy and knowledge, forcing humans to relate to spiritual experience just by being in sacred spaces. The built environment, however, should indicate this worldly Light as depicting paradise, a believable phenomenon even mentioned in our religious manuscripts. Usually, the focus was on the design elements of spatial planning of these built structures, yet other modifying design elements are used better to attain ecstasy and Light is one of them. Almost every religious building in the world has some wonders and depiction that makes them beautiful and recognizable across the globe. Hence Pakistan also has many beautiful buildings with glorious Islamic backgrounds focusing on Light. The Mosque, a perfect symbol of Islamic architecture, has a beautiful play of Light inside that reminds of the holy verses. This study focuses on the play of lights used in mosques as the best manifestation of Islamic architecture based on investigations through descriptive and explorative data for analyses. The study was carried out through a case study of the Wazir Khan Mosque, which is beautifully articulated with hierarchical lighting used to enhance Light's impacts for exploring the lighted spaces. The research findings are that the light display in the various parts of the mosques is beautifully intricated in such a manner as not only those parts keep the Mosque well lit for the Devotes like the central courtyard, Inner chamber that uses Light in a way that the identification of a place that leaves the user with sense holiness.

Keywords: Mosque, Light, Islamic architecture, Pakistan, Lahore, Masjid Wazir Khan.

INTRODUCTION

Light is characterized as the appearance of a vision of brilliant vitality. The sparkle of Light caused by the reflectance of Light from a surface depends on two factors: first, the reflecting surface and the amount of Light in every aspect of direct importance to the sense of sight, and second, the well-defined significance of the voids (Jourabchi, 1380). Depending on nature, inquiries into the cosmos produce Light or be seen by Light, the sun, liquid glass, fiber lights, or metal - or by the Light that transmits from the exterior surface of the human eye.

This Light's nature is Zoroastrian in concept, and it is decoded as the heavenly attendant of the holy Fire on the Jewish Light. In Christianity, Jesus Christ is "the word" and "light," or "God and light," or "Father." In Islam, the emphasis is placed on otherworldly Light. The Light in the supernatural nature of the Koran's imitations and the sway of names—the perfect sign Hqbh term "Al-Zaher" denotes that

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the Divine appeared in all creatures, occasionally revealed the hidden sciences, and was deliberate behind God from the heart. In Persian writing, Light has been utilized in numerous ways (Bolkhari, 1384). Le Corbusier (1972) also highlighted the importance of Light in the built environment, stating:

"The law of the Sun has stipulated architecture from the first steps."

He also narrates that:

"Architecture is a skillful, precise, wonderful play of volumes in the Light. Our eyes are made so as to perceive the forms that are lit."

Light Implications in Islamic architecture

Islamic engineering's accentuation on the part of Light is a wide sign. Even in Christian and Buddhist engineering, given the faith in the incarnation of "stupa" and "church," it is the interpretation of Buddha or Jesus. As the idea of immediacy with Allah is of supreme importance in Islam, Islamic design elements are a top priority when designing mosques. In this domain, utilizing these modifying designs, spatial arrangements, and materials is the primary task. It is also stated in Surah Al-Noor (24:35).

اللَّهُ نُورُ السَّمَوَاتِ وَالْأَرْضِ

(24:35) *"Allah is the Light of the sky and the earth."*

Fixation is applied to the Light shown in the engineering as an image of the heavenly and otherworldly pith. And it has turned out to be such an honorable and commendable thing, to the point that the human soul is the best possible area. The Light that comes from simple materials and minimizes the difficulty of the holy design is as frigid as the heart; this is the place where the spirit of man is obtained (Madadpur, 1390). Since Islamic craftsmanship has been skipped from the kingdom of the world, Light is regarded as a metaphorical component of the appearance of outright, and Suhrawardy's school of thought claims that lights will light the sky and the earth (Davud, et al., 2015). For Islamic scholars, Light is divine, and they connect this divinity of Light with the verses of the Qur'an. For them, Light is a derivative instrument, and it originates from the authentic base of religion, and for them, genuine faith is the word of the Almighty. This Light also manifests the complete knowledge of what is considered the truth in Islam. The designers of religious buildings attempt to bring this philosophy together to create a composite whole of truth, divine knowledge, and the presence of the Almighty manifested through the presence of Light in mosques. According to Surah Al Jinn (72:18),

وَأَنَّ الْمَسَاجِدَ لِلَّهِ فَلَا تَدْعُوا مَعَ اللَّهِ أَحَدًا

(72:18) *and that "mosques belong to Allah, so do not invoke anyone with Him."*

It has been asserted through a literature survey, and analytic study of the Mosque designs that Light plays the most central role in not just the architectural design but also in inducing spirituality in the space and the individual. It is a means of being unified with the Creator. It is thus about declaring that there is nothing to hide from the Almighty for the worshiper. Light is almost universally understood to represent extraordinary supremacy and to be an essential part of anything excellent. The transformation of cloudiness into Light is seen as a necessary aim for development. According to various verses in the Quran, on the off chance that we concede that Light has dependably been considered a representation of God and his qualities, then the usage of Light in the expert domains, which are derived from religious musings, would not be astonishing at all. Then again, developed orientalist such as Henry Corbin, René Guenon, Titus Burckhardt, and Mohammad Nasr, who have devoted their lives to uncovering the hidden reality at the center of Islamic culture, have talked ordinarily about the status of "light" and "glow" in the Islamic idea in their articles and investigations. Henry Corbin was one of the pioneers in this field. René Guenon was another. Titus Burckhardt and Moham's The sign of Light can help you understand Islamic philosophy. Sheik Ishraq, Ibn Arabic, and Mulla Sadra affirm that the stream of presence is reflected as Light and that wherever there is light, there is an indication of the nearness of the supreme presence. This is the profound idea behind this component of Islamic thought, and it is particularly prominent in Sheik Ishraq's writings. Furthermore, Islamic logicians and researchers believe that the scholars of the universe of symbols come from the Light.. Light is not only a determinant of good art personality but also influences craftsmanship to work as a proprietor of celestial quality and a portrayal of the outright presence. The impact of Light and shading in Islamic engineering is evident and has tremendous significance (Nejad et al., 2016). (Surah At-Taubah 9:17) states

مَا كَانَ لِلْمُشْرِكِينَ أَنْ يَعْمُرُوا مَسَاجِدَ اللَّهِ شَاهِدِينَ عَلَىٰ أَنفُسِهِم بِالْكَفْرِ ۗ أُولَٰئِكَ حَبِطَتْ أَعْمَالُهُمْ وَفِي النَّارِ هُمْ خَالِدُونَ
(9:17) *It is not for the polytheists to maintain the mosques of Allah [while] witnessing against themselves with disbelief. [For] those, their deeds have become worthless, and in the Fire, they will abide eternally.*

Mughal architecture and Light

The Islamic design emphasized, in particular, distinct categories of Light. The inside of a mosque is suggestive of the Light that crystallizes a material reminiscent of light verse. The component of Islamic Mughal engineering is light, not as a physical component, but as a representation of God's wisdom and images. This is because Light is an image of God. Light has such profound proximity that it has become exceedingly challenging to penetrate matter. The matter is an honorable shape, and Light's presence makes a location lovely and worthy of the human intellect. Surah Al-Isra (17:1) narrates

سُبْحَانَ الَّذِي أَسْرَىٰ بِعَبْدِهِ لَيْلًا مِّنَ الْمَسْجِدِ الْحَرَامِ إِلَى الْمَسْجِدِ الْأَقْصَا الَّذِي بَرَكْنَا حَوْلَهُ لِنُرِيَهُ مِنَ عَائِيْتِنَا ۗ إِنَّهُ هُوَ السَّمِيعُ الْبَصِيرُ
(17:1) *Exalted is He who took His Servant by night from al-Masjid al-Haram to al-Masjid al-Aqsa, whose surroundings we have blessed, to show him of Our signs. Indeed, He is the Hearing, the seeing.*

Light is the totality of components influencing the estimation of physical space. It is regarded as the most significant component of nature, which has consistently existed in Islamic design in vast and profound spaces. Of mind in Light of Islamic Mughal engineering is impacted by Islamic thought, and this is achieved in its most elevated form as an image of blessedness. This view is profound and known all across the world. As part of their space, Islamic Mughal design made use of splendid Light in compositional space, a space that is not fully utilized but gives off the effect of a deep sense of being and heavenliness, and different perspectives (shading, surface, and so on) influenced the impact of Light. Not only that, but it frequently emphasizes homogeneous Light in engineering with Islamic vision and dual esteem, as well as the significance of it along these lines, which can be shortened as follows: Islamic vision, confidence, and confidence in the realm of supernaturalism made in the Light that we can see correctly what will tumble from paradise to earth light and that the Islamic vision that has an endless history of our engineering with our design is exceptionally homogeneous and part of our engineering is remarkably homogeneous, and part of our engineering is extremely homogeneous. For seamlessness, magnificence, lighting, and the internet, unity in differences and open space have always been our structural past.

METHODOLOGY

The present research aims to study the impact of "light hierarchy," the placement of Light and objects reflecting Light in mosques through Islamic principles. The Wazir Khan Mosque is part of the case study and is located in the interior, old city of Lahore. The focus of the research is on the application and investigation of light placements in qualitative terms. This paper will also use descriptive and analytical methods to study the interpretation of Light in designed spaces. The study uses extensive research from a literature study via articles, research papers, and books on the topic relevant to the study.

The importance of Light in mosques architecture

Every religion needs a place for religious congregation and to feel near to the supreme deity it refers to. For Muslims and in Islam, the most sacred and holiest site is a mosque. Hence, it is of the utmost importance to believers of Islam to design a mosque in such a way that it increases the experience of the religion of the worshipers and enriches and strengthens their belief in it as well (Nejad, et al., 2016). Therefore, Light is being used as an architectural element to play with the space for the illumination of souls and to make the worshippers experience the vastness of the space through the interplay of Light for their mind and soul's satisfaction.

As previously stated, Light is the primary factor in adding another dimension to built structures. It is treated as a supernatural element, as one cannot touch it directly but see it. Thus, it provides us with transparency, divinity, eternity, and clarity. All the religious buildings, whether churches, stupas, tombs, or mosques, are designed to attract pilgrims following their religion and people from other religions as well. The believers wish to come to their holy places, in this case, the Mosque, to feel the divinity and connect to God better. Light interplay with the spaces there helps them achieve this goal. The more illuminated the mosques are, and the more emphasis is placed on human psychology for visitors to be

enlightened when they visit the mosques. As the Muslims believe that there is a supreme form of Light known as "noor" that was used to create angels, the visual prowess of our eyes plays a fundamental part in absorbing the lighting in mosques.

Consequently, the positively lit environment boosts their faith in ways that could not be achieved in a dimly lit, dull, and drab environment. The light hierarchy impacts were studied and explored with the Wazir Khan Mosque case study, one of the finest examples of the magnificent play of Light through architecture. The Mosque is in the Walled City of Lahore, on the side of Shahi Guzargah that faces south. The Mosque also faces Wazir Khan Chowk, a town square. Structurally, the Mosque can be divided into three parts along the horizontal plane, called levels (Noor, 1384). The basic level, Level 0, contains the shops that form the perimeter of the Mosque (Figure 3) from both the eastern and northern sides. The next level is Level 1, which is the actual area of the Mosque (figure 4). The last is Level II, those areas of the Mosque that can be accessed from Level I through a staircase.



Fig 1: Shows the Ariel view of the Mosque

Source: <https://www.pond5.com/stock-footage/item/172478658-aerial-view-wazir-khan-mosque-dehli-gate-walled-city-lahore> Retrieved on 3rd August 2019

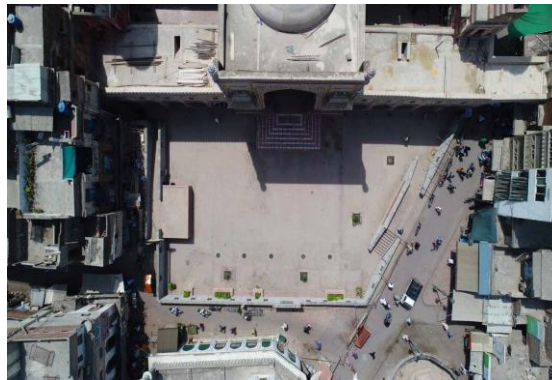


Fig 2: shows the perimeter of the internal courtyard

Source: <https://www.pond5.com/stock-footage/item/172478658-aerial-view-wazir-khan-mosque-dehli-gate-walled-city-lahore> Retrieved on 3rd August 2019

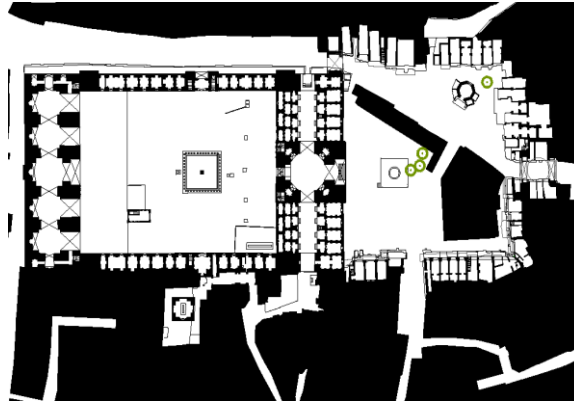


Fig 3: Master Plan of the Mosque[10]

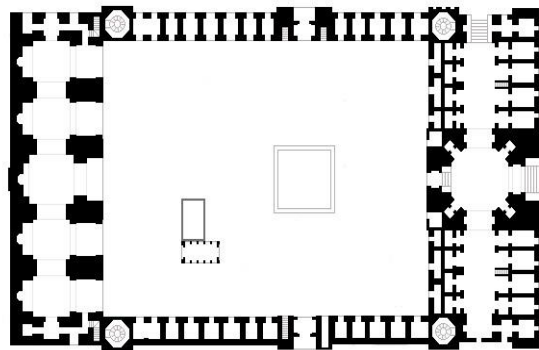


Fig 4: Ground floor plan of the building[10]



Fig 5: Entrance to main Prayer Area, Source: Author



Fig 6: Shadows cast through the surrounding buildings,
Source: Author

Natural Light can be provided inside the mosques in several ways. Principally, it is achieved by providing a central courtyard inside the mosques. Even if the adjacent buildings are high rises or there aren't enough punctures, such as windows, arcades, arches, or doors, the influx of Light is bound to occur inside the Mosque. Other methods include providing monitors, clearstories, arches, windows,

doorways, etc. At times, decorative elements like jalis are also introduced further to dramatize the impact of Light inside the mosques.

To achieve the right effect of spirituality and the presence of "noor" in a mosque, the placement of domes, courtyards, windows, archways, and doors plays an essential part. Suffice it to say that the architectural design of a mosque defines the use and spread of Light inside it. The Mosque's rectangular shape covers an area of 86.17 x 50.44 m (Antonakaki, 2007). Here, it was easy to see that the central courtyard method controls how much Light gets into different parts of the Mosque. Through the portal and octagonal chamber, you can get to the central courtyard of the Mosque. At each end of the courtyard, there are four minarets. The courtyard is about 160 feet by 130 feet and has a central brick-paved courtyard surrounded by high-arched galleries—these standard features of imperial Persian mosques in Iran (Figure 4). The courtyard size is enormous, and no artificial light needs to be provided to illuminate the prayer hall. The main prayer hall has five giant arches that allow daylight to enter the space. The rhythmic blend of Light and prayer hall is an interpretation of the wideness of the heart to achieve higher spiritual status. An arched doorway at the extreme right side of the prayer hall can be used as a side entrance to the Mosque, but this entrance is kept locked. The central courtyard also provides Light to the Hujras, or private rooms, running parallel to each other on both sides of the courtyard adjacent to the prayer hall (Figure 8). There is also an opening in each of the Hujras facing opposite directions to the courtyard. The architectural setting of punctures in the solid masonry replicates the illumination effect of religion on individuals.



Fig 7: Light coming inside the prayer hall, Source: Author

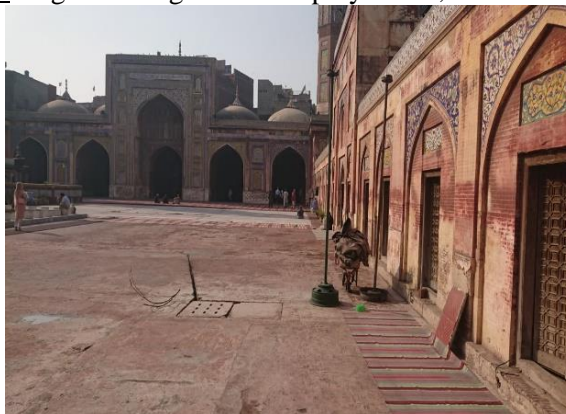


Fig 8: The outer courtyard of the Mosque, Source: Author



Fig 9: Shadow casted through the inner courtyard



Fig 10: Main entrance to the Mosque

Source: Author

The minarets of the Mosque are four in number, and their top can be reached through 103 stairs inside each of the minarets. The stairways inside the minarets have small ventilator-like punctures present at some intervals. These punctures illuminate these stairways. An entrance podium is present along the prayer hall's central axis. This podium gets decorated from four sides through the open corridors at its right and left sides. The Light also enters it through wazir khan square and the central courtyard of the Mosque. The portion at either side of the entrance portal, known as the calligrapher's bazaar, is illuminated through the open corridor. It has been designed carefully to get the benefit of daylight in the maximum possible way for the maximum number of hours of the day. Had clearstories been used underneath the domes of the prayer hall and the one present at the entrance portal, they would have lit up the spaces lying directly below them in a better way.



Fig 11-12: shows the outer view of the Mosque in terms of the segregation of Spaces



Fig 13: Light striking the facade



Fig14: Ambulation space in the courtyard



Fig-15: Light entering the rooms, Source: Author

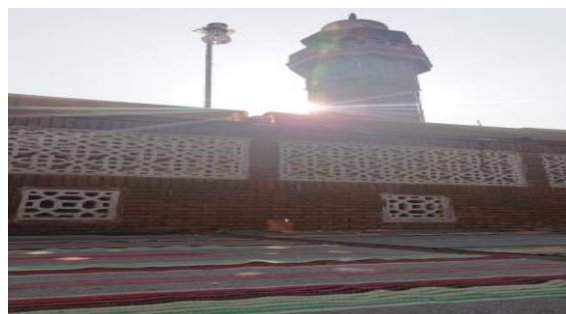
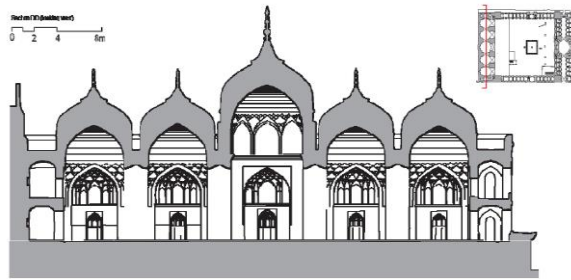


Fig 16-17: Sun Glare through the Jaliwork patterns, Source: Author



Mosque name	Wazir Khan Mosque, Shahi Guzargarh, Chota Mufti Baqar Walled City, Lahore
Role of Light openings	As referring to Fig-2, 4,5,6,7,8 & 9 indicate, the use of Masjid devotees increases during salah. Therefore, the courtyard is used as a well-lit prayer area. Similarly, Fig 10 & 15 shows the play of solar Light inside the inner chambers for the prayer by keeping the natural Light inside.
Light-making zone & Boundaries	Referring to Fig 2,5 & 7, the light zones are the inner courtyard, entrance & Inner chamber. As the sun moves, the shadows are cast at a lower angle keeping the inner chambers well-lit until the sunset in the evening.
Hierarchy of Light & Shadow	As Light keeps the Mosque well lit during most of the daytime, it takes the lead in other Architectural styles of the Built environment.
The proportion of the walls with windows	Figures 3, 4, 6 & 8 indicate that the inner courtyard's walls have Arch openings and doors that keep the inner prayer halls well-lit.
Patterns made by Light	Fig 17 shows the reflection made by the Solar Light at different parts of the Mosque.

Fig18: A sectional elevation of the main prayer chamber (Muhammad,2017)

The image above shows the sectional elevation of the main hall used for praying so that the worshippers should not be confined to one place. They can move around the Mosque and perform their prayers at any location. Through this sectional elevation, the basic architectural design of the Mosque is made clear. There are domes and windows alongside the bottom of the domes. Archways can also be seen. The light passage of the Mosque and the illumination pattern are seen through this sectional view, and the use of domes, windows, and archways can also be witnessed. In a mosque, Light enters from the dome and then spreads downward to create a halo of Light in which the worshippers congregate and feel the spiritual impact of natural Light. The domes are large with supporting reflecting mirrors, "jalis," and other instruments that would not alienate the worshipper from the place of worship and, ultimately, the religion. With reference to Muslim architectural design, Light is designed to enter the Mosque through a dome and in many different ways. Windows, both colorful and gridded, are used to manipulate the Light and its intensity inside the Mosque (Shokrpour, et al., 2015). At times, wide spaces are also induced without load-bearing walls to drive Light and its reflections. One can also add carved screens to the interior of the Mosque to increase lighting. The entrance of Light inside the main prayer hall of the Mosque can be achieved through the dome by providing one or multiple punctures inside the dome. There are usually three methods that can be followed to achieve illumination through the dome. One is providing an oculus in the central portion of the dome.

On the other hand, we can also provide a clearstory at the dome's base horizontally. The amount of Light under the domes was tested in three different ways: with a dome with no openings (like the original building), a dome with one opening in the middle, and a dome with openings all around the base. It was found that a dome with openings around the base spreads Light evenly all over the prayer hall between the essential times of noon and three o'clock. It also makes the amount and quality of Light better. The Wazir Khan Mosque's illumination is achieved by providing punctures at the base that provide natural Light.

CONCLUSION

Islam is a complete religion resulting from the concept of the nearness of God, the physical indication of which is realized through Islamic engineering. The Android application is the most vital image of the appearance of the material reflections. As a result, such things should cast Light, the effects of which should represent the sky and the earth, the genuine primary total. Because the kingdom of the world is associated with Islamic craftsmanship, Light is the non-literal component of the appearance of a flat-out treat component is prominent in Islamic architecture and is viewed as an image of God's presence and intelligence. Light creates an idea of the variables influencing space estimation, and this presentation creates a glorious reality that implies a deep space. Our sure belief should be the one described in Surah At-Taubah.

إِنَّمَا يَعْمُرُ مَسْجِدَ اللَّهِ مَنْ ءَامَنَ بِاللَّهِ وَالْيَوْمِ الْآخِرِ وَأَقَامَ الصَّلَاةَ وَءَاتَى الزَّكَاةَ وَلَمْ يَخْشَ إِلَّا اللَّهَ فَعَسَىٰ أُولَٰئِكَ أَن يَكُونُوا مِنَ الْمُهْتَدِينَ

(9:18) *The mosques of Allah are only to be maintained by those who believe in Allah and the Last Day and establish prayer and give zakah and do not fear except Allah, for it is expected that those will be of the [rightly] guided.*

Dispositions in Light of Islamic Mughal architecture are affected by Islamic premonition. Lightly felt in this way results in achievement at its most significant degree. Light no doubt plays the most fundamental aspect in mosques and in defining their interior, but the use of natural sunlight inside the Mosque is dependent on the structure of the Mosque, as depicted in the Wazir Khan Mosque. However, the essential architectural components remain the same, like the domes, windows in the domes, columns, arches, varying sizes of windows, colored glass, carved screens, and oculus openings. What changes is the placement of these components, and how are they mixed in the design of the Mosque, like in the studied Mosque? The Wazir Khan Mosque's rhythmic interplay of Light and space interpreted the concept of illumination of the world with the advent of Islam and the fulfillment of souls with spiritual Light.

Future Recommendations

The services of renowned lighting experts should be hired by the local government authorities to introduce new, natural lighting elements that blend in with the architectural aura of the Wazir Khan Mosque. A good share of tourists visit the Mosque during the night, so artificial lighting schemes can be strategically introduced to enhance the beauty of the historic building. Lighting should not be limited to the main entrances and hall of the Mosque. The secondary entrance of Wazir Khan Mosque lacks natural and artificial lighting, and proper attention should be given to such crucial parts of the building. Artificial lighting can be achieved by using high-powered Light beams that focus on the architectural features of the building but should not be visible to the naked eye. The lighting patterns of historical mosques around the world should be studied to develop a comprehensive lighting plan.

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