

# ARCHITECT SINAN'S SPATIAL EXPLORATIONS AND URBAN "SCULPTURES" IN ISTANBUL

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## ABSTRACT

Despite the prohibition of sculpture in Islamic art, the renowned Ottoman architect, Mimar Sinan, transcended this limitation through his architectural mastery. Over his tenure as chief architect of the Ottoman Empire, spanning half a century, Sinan's constructions attained a monumental sculptural quality. Viewing constraints as opportunities for creative innovation, he transformed structures ranging from modest buildings to grand architectural complexes, aqueducts, and bridges into sculptural entities. The aesthetic sophistication of his works not only surpassed those of his predecessors and contemporaries but also integrated innovative technical solutions with refined artistic expression. Through his novel spatial compositions and continuous architectural experimentation, Sinan positioned himself at the confluence of art and science. Architecture, in his hands, became a vehicle for expressing religious devotion, political authority, and artistic ingenuity. By the late sixteenth century, Istanbul had been reshaped by his interventions, earning the moniker "Sinan's Istanbul." This study aims to explore the intersections of art and science within his oeuvre, emphasizing the sculptural nature of his structures and their impact on the spatial organization of Istanbul.

**Keywords:** Architect Sinan, Ottoman Architecture, 16<sup>th</sup> century, site organization, urban sculptures.

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## 1. INTRODUCTION

Doğan Kuban, in his seminal work *Ottoman Architecture*, describes Sinan's Selimiye Mosque with a striking analogy: "It is a bizarre dream to imagine a series of sculptures placed between the two minarets of Selimiye, atop its portico, akin to the façade of Saint Peter's Basilica" (Kuban, 2007). Kuban's observation underscores a fundamental paradox: the Ottoman Empire, adhering to strict Islamic precepts that forbade the depiction of living beings, particularly in sculpture, paradoxically produced an architectural legacy that emulated sculptural grandeur. While Western architectural traditions embraced figurative sculpture, Ottoman architecture relied on monumental form, spatial articulation, and structural ingenuity to achieve comparable artistic expressiveness.

During the sixteenth century, under the reign of Sultan Süleyman the Magnificent, Sinan emerged as the preeminent architect of the

empire, responsible not only for constructing numerous buildings but also for training successors and shaping urban landscapes. His architectural output, exceeding 400 structures, predominantly in Istanbul, demonstrates an unparalleled synthesis of functionality, aesthetics, and symbolic meaning (Kuran, 1986). Unlike many of his Islamic and European contemporaries (Rogers, 2006), Sinan's architectural significance was not merely quantitative but qualitative—his structures exhibited a sculptural interplay of volume, symmetry, and spatial hierarchy that transformed the city's skyline.

This study examines the sculptural essence of Sinan's architectural works and their role in redefining the urban fabric of Istanbul. Specifically, the research explores three key dimensions: the monumentality and aesthetic refinement of his constructions, the innovative spatial relationships he introduced between buildings and their environment, and his urban

planning strategies that fostered a dialogue between architectural elements across the city. In other words, the three levels of perception are examined, e.g. building level, site level and city level.

To evaluate these structures, this study adopts a combined architectural and urban analysis approach, integrating visual assessment, spatial mapping and historical documentation. The sculptural essence of Sinan's architecture is explored through detailed morphological analysis, focusing on the interplay of form, materiality and light. The three main themes - monumentality and aesthetic refinement, spatial relationships and urban strategies - emerge from a comparative assessment of key buildings, systematically examining structural composition, proportional harmony and site integration. The chosen method of analysis includes a qualitative assessment of spatial configurations and a contextual examination of historical sources, ensuring a comprehensive understanding of Sinan's architectural innovations within the evolving urban fabric of Istanbul.

## 2. SINAN'S ARCHITECTURAL CONTEXT: BETWEEN OTTOMAN AND RENAISSANCE TRADITIONS

To understand Sinan's architectural contributions, it is essential to consider the traditions that preceded him. Early Ottoman architecture, particularly in Bursa and Edirne, evolved from Seljuk precedents, incorporating the central dome as a defining feature. The 1447 Üç Şerefeli Mosque in Edirne marked a turning point by introducing a more cohesive spatial composition, which influenced later mosque designs. However, many pre-Sinan structures exhibited structural limitations that he later resolved. (Bakırer, 1999)

In comparison, sixteenth-century Renaissance architecture in Italy emphasized classical harmony and mathematical precision. Santa Maria della Consolazione in Todi (1508), for instance, employed a domed structure similar to Sinan's Şehzade Mosque, though its design prioritized centralized symmetry rather than the fluid spatial arrangements characteristic of Sinan's works. Likewise, Michelangelo's dome for St. Peter's Basilica surpassed the dimensions of Sinan's mosques, yet their architectural philosophies diverged—

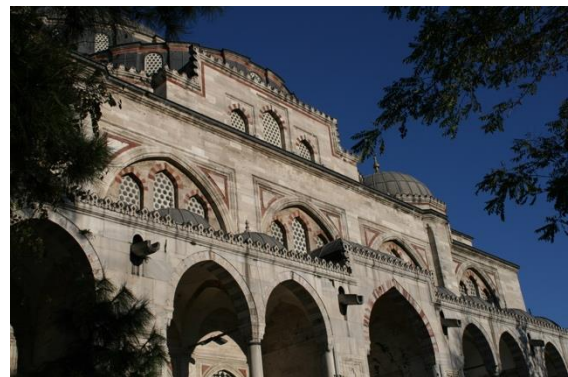
Renaissance architects sought geometric perfection, while Sinan emphasized spatial continuity and urban integration. (Erzen, 2004; Günay, 2020)

## 3. SINAN'S URBAN SCULPTURES: ARCHITECTURAL INNOVATIONS AND MONUMENTALITY

Sinan's architectural achievements, particularly his imperial mosques, functioned as religious landmarks and expressions of Ottoman imperial authority. Commissioned by sultans and statesmen, these structures conveyed power and prestige, paralleling the patronage of monumental sculptures in Renaissance Europe. His expertise lay in synthesizing form, structure, and site conditions into cohesive compositions that dynamically engaged with their surroundings.

### 3.1. Şehzade Mosque

Commissioned by Sultan Süleyman in memory of his son Mehmed, the Şehzade Mosque marked a critical juncture in Sinan's architectural development. Its symmetrical layout, intricate detailing, and rhythmic façade articulation distinguished it from earlier Ottoman mosques. The inclusion of side arcades introduced a newfound spatial dynamism, reinforcing its sculptural engagement with the surrounding environment. Therefore, in addition to its innovative structure (Özgüleş, 2008), this monument was a leap forward in façade composition.



**Figure 1.** The western façade of Şehzade Mosque. (author's photo, 2024)

The mosque's centrality was further reinforced by its impeccable symmetry, with the courtyard mirroring the prayer hall in floor area, thus establishing one of the most harmoniously proportioned arcade spaces. A groundbreaking innovation in Ottoman architecture introduced

in this design was the incorporation of side galleries. These expansive arcades flanking the mosque were not merely structural additions but dynamic architectural elements that enriched the visual composition of the façades. Goodwin also observes that such grand façades, reminiscent of the grandeur of the Western Renaissance, had been notably absent in earlier Ottoman architectural traditions. (Goodwin, 1993)

### 3.2. Süleymaniye Mosque

Perched atop Istanbul's third hill, the Süleymaniye Mosque exemplifies Sinan's mastery of integrating architecture with the natural topography. Its cascading domes and semi-domes create a sculptural effect, solidifying its dominance over the city skyline. According to Goodwin, the contrast of convexity and concavity is the architect's response to a nature of hill and dale, foreground and background, the swelling and sinking of the landscape (Goodwin, 1993). On the other hand, the strategic placement of four minarets—two towering adjacent to the mosque and two shorter ones at the courtyard's edges—establishes a visual balance that enhances the mosque's monumental presence.



**Figure 2.** The unique placement of four minarets around the courtyard of Süleymaniye Mosque. (author's photo, 2008)

### 3.3. Edirnekapi Mihrimah Sultan Mosque

Regarded as one of Sinan's most elegant compositions (Karaesmen, 2008), the Edirnekapi Mihrimah Sultan Mosque exemplifies innovative façade design. The interplay of natural light and structure, facilitated by an extensive window arrangement, imbues the mosque with a luminous quality, highlighting Sinan's ability to manipulate architectural mass and void for sculptural expressiveness. As Goodwin (1993) notes, "other Islamic masonry buildings

matched but could not surpass this achievement, which would not be surpassed until the eighteenth and twentieth centuries".



**Figure 3.** Mihrimah Sultan Mosque in Edirnekapi, Istanbul. (author's photo, 2024)

The southern façade of this remarkable work is distinguished by the presence of volutes flanking the polygonal-shaped turrets, a unique design feature. This particular structural element, in a similar form, later emerged in early Baroque churches in Europe, such as Il Gesù in Rome (Gombrich, 2022). In essence, introducing such architectural innovations was a defining characteristic of Sinan's artistic approach. Moreover, the progressive refinement of his elevations over the course of his career serves as further evidence of his architectural mastery and creative evolution. (Erzen, 2007)

### 3.4. Zal Mahmud Paşa Mosque

Among Sinan's later mosques, one that reflects his continued pursuit of architectural innovation is notably distinct from his earlier works in both spatial arrangement and façade composition. The Zal Mahmud Paşa Mosque features a striking combination of red brick and white stone, with uniformly arranged windows adorning its walls. The unconventional façade of this structure has been likened to that of a palace, a comparison articulated by Cerasi as follows:

"Uniformity of openings both horizontally and vertically had been established in Renaissance Europe with the palace architecture of Tuscany. That regularity was a consequence of the application of the Classical orders or, even when it was not accompanied by the halfcolumns and modanature of the orders, was assumed to be a paradigm of

order, rationality, and majesty. In the later works of Sinan and his school, as, for example, in the Zal Mahmut Paşa and Ivaz Efendi mosques, this scheme often replaced the complex compositions of earlier mosques.” (Cerasi, 1987)



**Figure 4.** Zal Mahmut Pasha Mosque, Istanbul. (author’s photo, 2024)

### 3.5. Mağlova Aqueduct and Büyükçekmece Bridge

The waterworks constructed by Sinan throughout Istanbul warrant significant attention not only for their advanced technological features but also for their monumental presence as civil engineering achievements. Despite being designed primarily for utilitarian purposes, these structures possess a striking architectural quality. A prime example is the Mağlova Aqueduct, which, through its sculptural form, seamlessly connects two hills, demonstrating a level of design excellence comparable to Sinan’s grand mosques (Kuban, 2017). Situated within a valley, the aqueduct establishes an organic link between the hills, while its fluid and dynamic form enhances the surrounding uninhabited landscape. The interplay of arches, prisms, and triangular elements within its structure closely resembles the compositional approach of a sculptural work, setting it apart from earlier aqueducts that merely adhered to repetitive formal arrangements.



**Figure 5.** Mağlova Aqueduct, Istanbul. (author’s photo, 2024)

Another notable example of Sinan’s functional architecture is the bridge spanning Lake Büyükçekmece, an exceptional structure in which structural integrity and aesthetic considerations are harmoniously integrated to achieve both rhythm and stability (Erzen, 2004). Constructed on stone foundations supported by wooden piles and utilizing small islands for reinforcement, the bridge extends 635 meters, exemplifying the seamless fusion of artistic creativity and engineering expertise (Kuban, 2007). Its design features four undulating rises and falls, albeit in an irregular manner, serving not only as a physical link between the two shores of the lake but also as the sole structure bearing the architect’s signature.

## 4. SINAN’S SITE ORGANIZATION

Sinan’s innovative approach to site organization transformed Ottoman architecture by redefining the relationship between buildings and their environments. He skillfully manipulated urban topography or implemented inventive layouts that enhanced the city’s skyline, giving the buildings a sculptural character. According to Erzen (2004), in addition to the interior courtyards, the spaces between buildings or between structures and garden walls—whether designed as alleys or left in their natural state—create spatial envelopes that connect buildings in a visually striking manner.

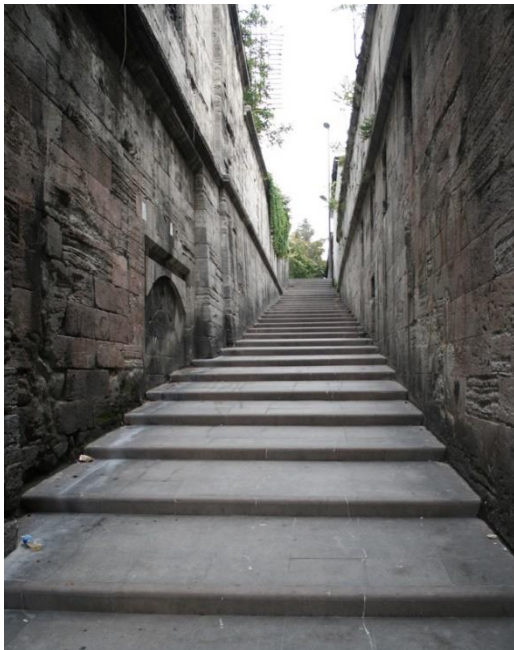
Sinan’s later complexes, built after the 1570s, adopted a more dynamic form, often utilizing diagonal axes. For instance, the Şemsi Paşa Mosque in Üsküdar is oriented at a 45-degree angle and features a portico on two sides. Similarly, the Zal Mahmut Paşa Mosque in Eyüp presents a diagonal design with an L-

shaped medrese. Both structures introduced varied perspectives, positioning the buildings creatively within the urban fabric. Such diagonal arrangements in mosque plans were not seen again until the 18th century, when Baroque and Rococo influences began to be integrated into Ottoman architecture.

#### 4.1. Süleymaniye Complex

Among Sinan's works, the Süleymaniye Complex stands out as a prime example of his mastery in site organization. The complex was designed in response to the Sultan's request for a monumental foundation. Sinan spent an entire year constructing the podium for the Süleymaniye Mosque, moving approximately 2 million cubic meters of earth to create a level platform that would elevate the mosque as the centerpiece of both the complex and the city; the setting for a *primadonna among mosques* (Goodwin, 1993):

“With the vision of genius, he did not raise the whole complex on a platform but let the colleges on the Golden Horn side of the mosque and the royal sepulchers descend the steep slope step by step and so not obscure the monumental view, which still survives from Galata and elsewhere down the shores of the Horn.” (Goodwin, 1987)



**Figure 6.** The narrow streets hide Süleymaniye until you reach up the platform of the mosque. (author's photo, 2008)

While the view of Süleymaniye from the Golden Horn is spectacular, its visibility from surrounding areas is limited. The narrow streets obstruct full views of the mosque until one reaches its outer walls. As one navigates through these streets and ascends to the mosque's platform, the full grandeur of the structure is revealed:

“The view of the mosque unfolds sequentially at every turn; a complete view is possible only at close distances and only with imperial mosques which are treated almost as sculpture and are intended to be seen as a whole. In small mosques, the walls separating the courts and cemeteries obstruct such a total view of the building. In any case, the idea of perceiving the building as a sculptural mass from a distance is not predominant in this period of Ottoman architecture, as it would become later in the 18th century, with Westernizing influences.” (Erzen, 2004)

#### 4.2. Kadirga Sokollu Complex

Sinan's ability to leverage topographical variations is evident in the design of the Sokollu Mosque in Kadirga. The sloping site enabled him to create a visually engaging and three-dimensional arrangement of buildings within the complex (Erzen, 2004). The uneven terrain, rather than being a hindrance, became an advantage, allowing Sinan to achieve an organic dynamism in the relationship between the various buildings and spaces within the complex:



**Figure 7.** Kadirga Sokollu Mosque, which was built on an inclined area, is a good example of Sinan's manipulation of the topography of Istanbul. (author's photo, 2007)

“The construction of the magnificent porticoes and the courtyard of the Kadirga Sokollu Mosque on such a sloping site required a supporting wall. (...) The placement of the building complex on this site, where there is a difference in height of 5 metres between the main gate and the courtyard, and 4 metres between the courtyard and the dervish's lodge behind it, shows Sinan's skill in creating a site relationship, which we can also see in the Süleymaniye, Zal Mahmud Paşa and Üsküdar Mihrimah Sultan Mosques.” (Kuban, 2007)

This spatial complexity is also evident in other structures, such as the Azapkapı Sokollu Mosque and the Rüstem Paşa Mosque, where the buildings are elevated on platforms. These platforms were necessary for practical purposes—either to provide space for commercial activities below the mosque or to prevent moisture—but also serve to elevate the structures within the urban landscape, giving them a sculptural presence.

#### 4.3. Minarets

The placement of minarets, traditionally viewed as separate elements in Islamic architecture, was reimagined by Sinan as an integral part of the mosque's overall design. According to Kuban (2007), Sinan's innovation eliminated the minaret's role as a standalone tower, instead incorporating it into the mosque's composition. He was keenly aware of the minaret's architectural function as well as its contribution to the mosque's silhouette (Tayla, 1996).

In his early work at Şehzade, where the massive side walls of Ottoman mosques are replaced with galleries, the relationship between the minaret and the mosque is established through the side arcades. Even in his smaller works, Sinan's strategic placement of minarets enhanced the architectural composition. For instance, in the Piyale Paşa Mosque, the minaret is positioned at the center of the entrance, while in the Azapkapı Sokollu Mosque, it is connected to the mosque via an arch structure, resolving the traditional issue of their relationship (Egü, 1997).

### 5. SINAN'S CITY PLANNING

Sinan's contributions to urban planning are an essential aspect of his architectural legacy in

Istanbul, particularly in relation to his sculptural approach to the city's built environment. Beyond designing and overseeing the construction of major buildings both in the capital and across the empire, he was also responsible for various administrative aspects, including sewer systems, fire regulations, and the maintenance of public monuments (Goodwin, 1971). With this authority and responsibility, he strategically positioned his architectural works to contribute to the city's overall spatial composition. Reflecting this perspective, architectural historians have employed titles such as “Sinan's Construction of the Urban Panorama” (Guidoni, 1987) and “Sinan's Istanbul” (Günay, 2006; Erzen, 2004) in their studies of his urban interventions. Tayla, for instance, asserts that Sinan selected the sites of his mosques to facilitate the city's growth and guide its development (Tayla, 1996), while Erzen further elaborates on how he exercised this influence:

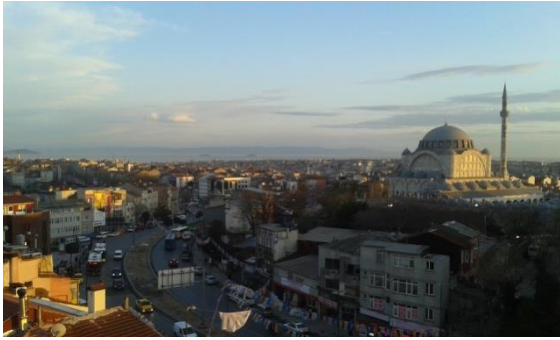
“In the Ottoman period, it is Sinan who, overseeing all the architectural activity of the empire, gave it its imperial form and meaning. He contributed to it a mechanism of connections that made it work as a whole. He activated the already existing foundation to function appropriate to an imperial Ottoman capital, by providing the necessary links and aesthetic significances, through his architecture.” (Erzen, 2004)

#### 5.1. Symbolism within the City

Sinan's architectural interventions in Istanbul were shaped by both the city's topography and legal constraints. While he had the ability to acquire additional land for his building complexes, he lacked the authority to restructure entire districts or extend roadways in the manner of contemporary urban planning. More significantly, he had no intention of doing so. Instead, he embraced the city's natural form, characterized by its seven hills and the valleys between them, integrating his works within this existing landscape. It could even be argued that rather than imposing his own vision onto the city, he allowed the city itself to dictate his architectural decisions (Goodwin, 1987).

This approach aligns with the prevailing worldview of the time, in which artistic creation and storytelling were perceived as mere

enhancements to an already harmonious and divinely ordered environment. Within this paradigm, an artist's primary duty was to respect and adhere to the existing order, integrating their work within its framework. The artist was expected to harmonize their creation with the natural and built surroundings, as they were ultimately accountable not only to the Sultan but also to God (Erzen, 1991).



**Figure 8.** The Mihrimah Sultan Mosque at Edirnekapı, visible from many points in the city, crowns Istanbul's sixth hill as an organic extension, but does not dominate it. It also serves as a landmark for the nearby city gate and adorns the main ceremonial route. (author's photo, 2018)

In this context, Sinan designed his grand complexes as carefully orchestrated architectural compositions that functioned as urban stages for the display of Ottoman ceremonial traditions. He meticulously calibrated their monumental presence to serve as a backdrop for these public spectacles. By incorporating elements such as transparency, subtle contrasts, and visual diversions, he rendered these celestial structures more accessible and relatable to the mortal realm. Through this approach, Sinan devised a novel method of fostering a connection between the city's inhabitants and their urban environment, establishing an aesthetic dialogue through his sculptural architecture (Erzen, 1991).

Moreover, the symbolic significance of the mosque and its surrounding dependencies, arranged around a central religious core, reflects an allegorical representation of eternal life. As a result, these religious complexes hold profound meaning, embodying the spiritual values and principles to be upheld by the community. The mosque itself serves as an intermediary between the earthly and the divine: its northern courtyard symbolizes the dynamic and transient nature of life, while the mosque's

grand dome and sacred interior evoke the omnipotence of God and the authority of the Sultan. In contrast, the southern courtyard, which houses the cemetery, represents the final resting place of the departed, symbolizing the afterlife (Erzen, 1991).

## 5.2. The Spatial Dialogue Between Mosques

The Süleymaniye Complex, regarded as Sinan's architectural masterpiece in Istanbul, embodies profound symbolism and functions as both the spiritual and intellectual center of the capital. Its strategic location and commanding visibility reinforce its role as an assertion of imperial power. The monumentality of the complex is perceived from various vantage points across the city, establishing a unique spatial relationship with Sinan's other works. From within Süleymaniye, an observer can visually engage with many of his buildings dispersed throughout the urban landscape, creating a multi-dimensional dialogue between architecture, space, and the city's inhabitants. The radial arrangement of the complex's dependencies further integrates it into its surroundings, ensuring a seamless connection between the core structure and the broader urban fabric (Erzen, 2004). As Goodwin observes, "Before the twentieth century, the mosque was a focal point from which the whole city could be seen," highlighting that "the drama of the view from Galata is as good an example of Sinan's mind in action as can be found." (Goodwin, 1993)



**Figure 9.** Many other mosques of Sinan can be seen from Süleymaniye and even the mosques on the other shore of the Bosphorus are visible. In turn, they are in visual contact with Süleymaniye and each other. (author's photo, 2007)

Additionally, over twenty of Sinan's other mosques are visible from Süleymaniye, extending even to the opposite shores of the

Bosphorus. This reciprocal visual connectivity ensures that not only can one observe these structures from Süleymaniye, but the complex itself remains a dominant landmark visible from miles away. Among the significant monuments seen from Süleymaniye is the Hagia Sophia, the grand structure of Justinian, which posed a direct architectural challenge to Sinan and his patron during the mosque's construction. According to Necipoğlu, the visual reference to Hagia Sophia may have been a deliberate attempt to draw an ideological connection between Süleyman's mosque and the Temple of Solomon, reinforcing the sultan's image as a just and divine ruler (Necipoğlu-Kafadar, 1985). In essence, Sinan's scattered architectural works engage in a visual and symbolic dialogue, collectively shaping the city's spiritual and political landscape.

Conversely, more than ten grand mosques are visible from the Edirnekapı Mihrimah Mosque. In designing this structure, Sinan was confronted with the challenge of an unfavorable location atop a hill. To overcome this limitation, he elevated the mosque on a vaulted platform, enhancing its prominence within the urban landscape. Additionally, he endowed it with a remarkably tall and slender minaret, ensuring its visibility from a great distance—both from within the city walls and to travelers approaching from Edirne. This approach mirrors the function of Gothic church spires in Western Europe, which similarly served as visual landmarks within their respective cities (Goodwin, 1971).

## 6. CONCLUSION

The findings of this study reveal that Sinan's architectural mastery operates on three interconnected levels of perception: the building level, the site level, and the city level. At the building level, his works exhibit a sculptural quality achieved through a refined interplay of form, materiality, and light, reinforcing their monumental presence. At the site level, his spatial compositions establish dynamic relationships between structures and their immediate surroundings, enhancing both functional and aesthetic coherence. Finally, at the city level, Sinan's strategic placement of monumental buildings within Istanbul's urban fabric fosters a visual and spatial dialogue that transcends individual sites, unifying the city's architectural landscape. Through the applied

methodological framework, this study demonstrates how these three dimensions collectively shaped an innovative and enduring architectural language, solidifying Sinan's legacy in the evolution of Istanbul's urban identity.

Consequently, Architect Sinan's spatial explorations and "urban sculptures" in Istanbul, monumental even in their simplest forms, demonstrate his ability to transform architecture into a plastic art. Despite adhering to Islamic prohibitions against figurative art, Sinan's designs are remarkable for their simplicity and sculptural qualities, derived from the overall composition rather than internal or external decorative elements. The strategic placement of his structures in Istanbul, taking full advantage of the city's topographical challenges, further emphasizes their monumentality. Through these works, Sinan also conveyed religious symbolism, as well as expressions of power and authority.

Sinan's intellectual curiosity was comparable to the Renaissance spirit, marked by experimentation and exploration, and his contributions to Ottoman architecture are seen as foundational, much like the work of Leonardo da Vinci or other Western masters (Goodwin, 1987). His influence on Ottoman art history is unparalleled, with his works forming a core part of its narrative (Kuban, 2017). In conclusion, Sinan's name is synonymous with architectural excellence in the East, akin to Michelangelo's legacy in the West. Discussing the details of his works provides the same intellectual enjoyment as analyzing the masterpieces of Rembrandt or Da Vinci. His creations also captivated travelers to Istanbul, serving as sculptural monuments in a city where actual sculpture was absent. Sinan, through his innovative designs, found a romantic and creative solution to the prohibition of sculpture in Islamic art.

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