

Hagia Sophia & the Mosques of **Istanbul**



Hagia Sophia and the Mosques of Istanbul

Version 1.1

by David Raezer and Jennifer Raezer

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Introduction

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Please [check out our enhanced preview](#), which offers a deeper look at this guidebook.

For visitors to Istanbul, Hagia Sophia, which stands regally atop the first hill of Constantinople, is an iconic sight. The church redefined religious architecture and served as a source of inspiration for countless religious structures that followed, both Christian and Islamic. Use our downloadable travel guidebook to Hagia Sophia's enduring legacy.

Hagia Sophia and its Islamic architectural legacy

In this Approach Guide, we explore the iconic church of Hagia Sophia (built 532-537) in Istanbul (then Constantinople), the historical religious center of the Byzantine Empire. Our discussion centers around the church's history, its structural and design innovations, the inspiration for its innovative centralized floorplan (versus the prevalent basilican layout), and its world-class mosaics.

We then explore the church's legacy, particularly as an inspiration for the greatest of Ottoman architects, Koca Mimar Sinan (1491-1588). In this context, we profile Sinan's architectural style — including his four basic design styles — and his contribution to the Islamic architectural tradition. Finally, we finish with a profile of three of the finest mosques constructed or inspired by Sinan: Sultanahmet Mosque (Blue Mosque), Suleymaniye, and Rustem Pasa.

For all structures profiled, we offer **high-resolution floorplans that highlight salient features with color highlights** to ease identification.

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David and Jennifer Raezer
Founders, Approach Guides

Hagia Sophia in Profile

Dimensions and Innovative Central Floorplan

The **basilican plan precedent that had prevailed for two centuries was abandoned** in large part with the third iteration of Hagia Sophia: Hagia Sophia was based on a **central plan**. The primary prayer space was covered by an enormous dome (red highlights in Fig. 2 and Fig. 3), reaching 56 meters above floor level and spanning 31.2 meters in diameter; to put this in perspective, the largest dome in antiquity, that of the Roman Pantheon (built 126 CE), has a height and diameter of 43 meters.

However, Hagia Sophia is not a “pure” central plan church, in that it combines the centrality of a dome with the axially and openness of a normal basilica (in order to enable more people to attend masses). Further, the aisles and galleries give the internal space a complexity that blocks clear views of the boundaries of the church, creating at one time both **enclosed** (given limited horizontal views) and **open** (given expansive horizontal views) impressions.

- The designers engineered a **square-based core** (outlined by four massive central piers; green highlights in Fig. 2), supporting a dome of 100 Byzantine feet (31.2 m) in diameter. Off of this core, they created an axial west-to-east directionality by using two semi-domes on the east and west sides of the dome (yellow highlights in Fig. 2 and Fig. 3). Therefore, although this design introduced the central plan to church architecture, the semi-domes served to recreate a familiar classical, vaulted basilican shape, spanning the entrance to the nave.
- **Side aisles and galleries** were added to create an overall rectangular, but nearly square, shape for the overall floorplan; the church measures measuring 73.5 meters long and 69.5 meters wide. That said, the nave (positioned directly under the dome and semi-domes) is roughly twice as long as it is wide without the flanking galleries.



Fig. 3: Elevation and floorplan, Hagia Sophia.

Origins of Justinian's Central Plan Design

Prior to Hagia Sophia, churches were designed in accordance with the traditional Roman basilican plan, consisting of an overall rectangular shape, an apse, a timber truss (forming a triangular shape, with two rafters and a tie beam base) roof, and no dome.

This all changed with the Byzantine Emperor Justinian, the inspiration behind the paradigm-shifting third version of the church of Hagia Sophia: Byzantine churches were based on a central plan, with the primary nave-based prayer space enclosed by an enormous dome.

Why break from basilican plan precedent in favor of a central plan?

- **Eastern liturgical necessity.** The liturgy of the Eastern Orthodox Church based in Constantinople was (and presently remains) very different from that of the Western Catholic church based in Rome. In Rome, presiding priests had been relegated to the very front or apse of the church for services; the congregation filled the large majority of the church's interior, occupying the nave and aisles. However, in Constantinople, the congregation was relegated to the aisles and galleries above them (galleries were an Eastern Orthodox invention to provide greater viewing space); the entire nave and apse was the exclusive domain of the priests. The nave had to be clear in order to facilitate the various processions that were a

critical part of the Orthodox liturgy. Accordingly, in order to balance liturgical necessity and optimal viewing for the entire congregation, the Byzantines embraced a centralized church layout (often with a large central dome rising above) that incorporated wide naves and elevated seating in the galleries.

- **Pagan Roman inspiration.** Justinian was extremely religious and, as Emperor, viewed himself as having a direct link to God, consistent with the pre-Christian imperial Roman tradition. Accordingly, Justinian perhaps gained inspiration from pagan architecture, symbolic of such a link; centralized, domed plans were characteristic of temples (especially the Pantheon) or imperial halls. By contrast, in the absence of a strong secular power in Rome (Justinian was based in Constantinople at this time), the basilican plan prevailed, with no reversion to pagan architectural designs.

Architectural Precedent and Technical Innovations

Architects

The two most famous architects of the age, Anthemius of Tralles and Isidorus of Miletus, were entrusted with the church's design and construction. They made many innovations, the most important of which being the use of a new type of support mechanism for the large dome, called a pendentive.

Design precedent and prototypes

Bucking basilican plan precedent — keep in mind, the basilican plan had been used for the two holiest sites in Christendom, Saint Peter's Cathedral in Rome and the Holy Sepulchre in Jerusalem — the architects chose to draw inspiration from:

- **Pagan temples:** The domed Pantheon temple in Rome was the foremost among these.
- **Palace reception halls:** Symbolic of the emperor's power and quasi-divine status, they included the dome-capped octagon within Nero's Domus Aurea and the freestanding dome-topped decagon of the Temple of Minerva Medica.
- **Central plan churches:** San Lorenzo in Milan (built 375) and many small churches in the Eastern Roman Empire (early 6th century) embraced the tetraconch plan (that is, a central plan consisting of four exedras, or niches). These churches, however, did not employ a dome, but rather a groined vault (a vault produced by the intersection at right angles of two barrel vaults).
- **Prototypes for Hagia Sophia:** The churches of Saints Sergius and Bacchus (built 526/27-36) in Constantinople and the Church of San Vitale (built 532-37) in Ravenna.

The pendentive: A technical design innovation

Hagia Sophia's dome was supported by a **recent innovation, the pendentive**, which enabled a



Fig. 4: Interior, Hagia Sophia (highlights added).

Materials

- **Stone was used for the walls and piers.** The stone types utilized were chiefly limestone and greenstone, a local granite.
- **Brickwork was used for the arches and dome.** Interestingly, in Hagia Sophia, there is typically more mortar than brick in the whole combined mass, thereby ascribing greater importance to the quality of the mortar. The mortar is made from slaked lime, sand, and

Mosaics of Hagia Sophia

The Oldest Mosaics

The oldest mosaics in Hagia Sophia date from the 6th century and are comprised of gold-colored, abstract geometrical and floral designs on **the ceilings of the inner narthex and the aisles inside the church**. Note that many of these decorations were covered by Iconoclast crosses during the Iconoclast Period (726-843) – the period in which all figurative representations (icons) were banned from churches – but are still visible (see [Fig. 6](#)).



Fig. 6. Geometric and floral mosaics covered by Iconoclast crosses, Hagia Sophia, Istanbul.

It is important to point out that no figurative mosaics existed in Hagia Sophia, and therefore, none were destroyed during the Iconoclast Period; this Period simply marked an increased emphasis on the depiction of the cross.

Why were there no figurative depictions? This was probably due to the desire to complete

Sinan's Mosque Designs

Sinan's mosque floorplans assume several basic design schemes; we provide a basic description for each, as well what we believe are its best examples in Istanbul.

***Author Tip:** Unlike in many other Islamic countries, non-Muslims are allowed to enter all of the mosques in Turkey (except at prayer times). This affords the visitor a great opportunity to explore and learn all aspects of these magnificent structures.*

In the floorplans provided for each design scheme, the **central dome is highlighted in red**, **semi-domes in yellow**, and **the principal supports in green**.

Design 1: Square-Based, Single-Domed Mosques

Description

Structurally the most basic of Ottoman mosques, this design consists of a square base — consisting of four piers or columns — supporting a large, single dome, typically with a pendentive transition. See [Fig. 9](#).

The Haseki Mosque is the first structure Sinan built upon assuming the role of Chief Architect under the Sultan.

Examples in Istanbul

Haseki Mosque (built 1539) and Hadim Ibrahim Pasa Mosque (built 1551). See [Fig. 14](#) in next section for map marking locations.

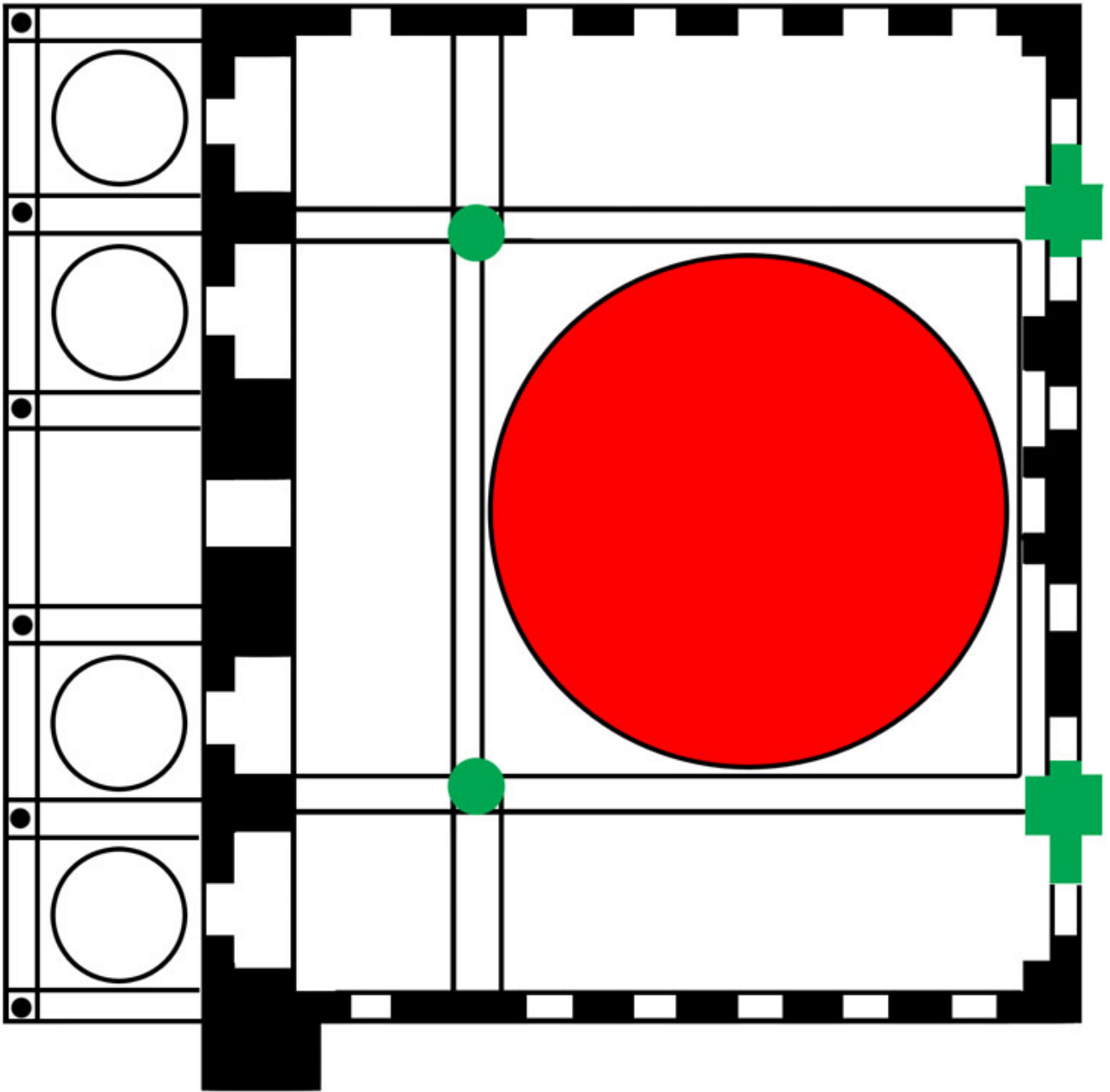


Fig. 9. Example, Mosque Design 1. Highlights added.

Design 2: Square-Based, Single-Domed Mosques with Semi-Domes

Description

This structure adds increased complexity to the design by introducing a **new element: the semi-**

Sinan's Major Works in Istanbul



Fig 14: Map of Highlight Sinan Mosques in Istanbul.

Suleymaniye Mosque

- Constructed from 1550-1557.

Floorplan

- Suleymaniye also conforms to **Mosque Design 2** laid out in the prior section. And this is Sinan's largest square-based, semi-domed mosque: a large central dome (red highlights in Fig. 19) rests on four massive piers in a square arrangement (green highlights); it is supported by two primary semi-domes (yellow highlights) that are each, in turn, reinforced by two smaller semi-domes (pink highlights).
- **The floorplan resembles that of Hagia Sophia** in that its semi-domes are oriented similarly, that is, in alignment with the qibla wall (altar in Hagia Sophia) and entranceway; the **qibla wall** marking the direction of prayer is marked in light blue highlights.
- The mosque's **four minarets** frame the entrance courtyard; their specific locations are marked in blue highlights. The two minarets on the outer periphery of the courtyard are 56 meters tall and have two balconies; those on the inner periphery against the facade of the mosque are 76 meters tall and have three balconies.

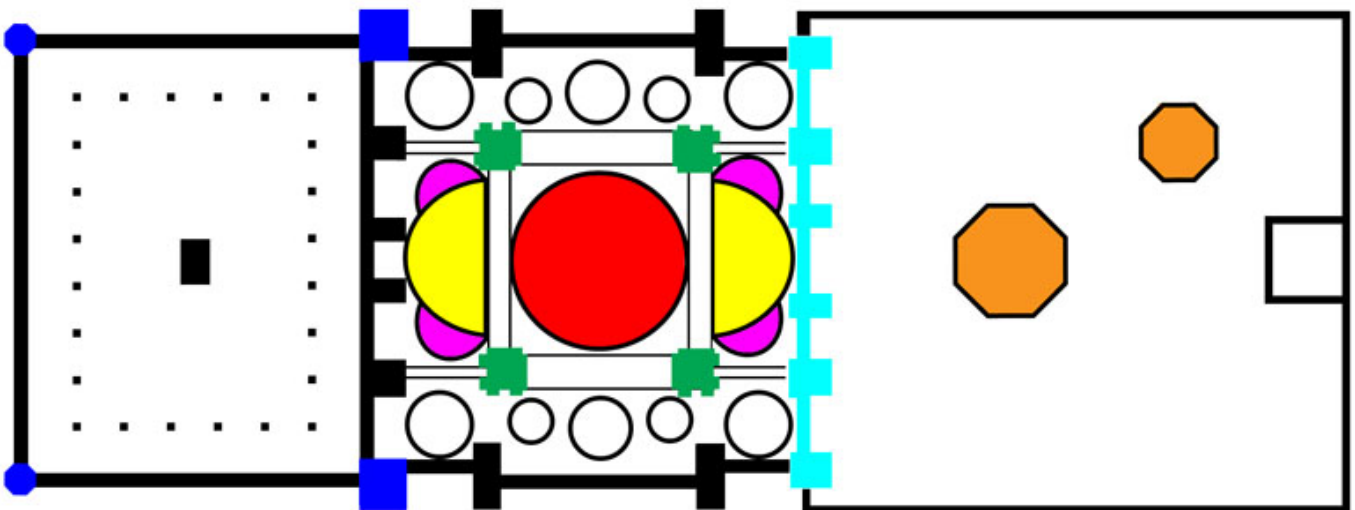


Fig. 19. Floorplan, Suleymaniye Mosque, Istanbul.

Two mausoleums

The mosque compound also houses **two royal mausoleums** (orange highlights in Fig. 19): (a) the larger mausoleum of Suleyman; and (b) the smaller mausoleum of Hurrem, the wife of Suleyman.

Pronounced pyramidal appearance

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Los Angeles Times

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