

# The Umayyad Mosque of Şan‘ā’ (Yemen)

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## Abstract

Architectural historians remember the Umayyad calif al-Walīd ibn ‘Abd al-Malik ibn Marwān (r. 86-96 AH / 705-715 AD) for sponsoring construction of the still extant “Umayyad Mosque” in Damascus, and for re-building the Maşjid al-Nabawī in al-Madīnah; he also completed his father’s re-building of the Aqşā Mosque in Jerusalem. Less well remembered is the enlargement of the Great Mosque in Şan‘ā’ by al-Walīd’s order. The appearance of the Mosque today is the result of several enlargements and additions carried out after al-Walīd’s time. However, archaeological investigations, which are part of an extensive restoration project begun in 2006, have found foundations, wall stubs, floors and other architectural features of an early Mosque. Moreover, some above-ground elements of the Mosque today (notably brickwork of the arcading in the qiblah riwāq) also belong to this same building. Although the dating evidence remains imprecise, the building was definitely built well before the 3rd century AH / 9th century AD. The building should therefore be identified as the Umayyad Mosque of Şan‘ā’. The structure formed a rectangle about 58 meters long (north-south) and 53 meters wide (east-west). The building consisted of at least three, probably four, arcaded halls arranged around a central courtyard. A *sawmā‘ah* or minaret stood at each of the southern corners of the building. A large entry porch at the center of the qiblah wall and elaborate doorways set in other walls gave access to the building. The archaeological investigations found no trace of a mihrāb. The architectural arrangements of this building increase the variability evident in Umayyad mosques.

**Keywords:** Early Islamic Architecture, Umayyad Mosque, al-Walid, Minaret, Yemen.

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## Şan‘a (Yemen) Emevi Camii

## Özet

Mimarlık tarihçileri, Emevi halifesi el-Velid bin Abdülmelik bin Mervân'ı (r. 86-96 H. / 705-715 AD), Şam'da hala mevcut olan "Emevi Camii"nin inşasına sponsorluk yaptığı ve Medine'deki Mescid-i Nebevi'yi yeniden inşa ettiği için hatırlanır; aynı zamanda, babasının başlattığı, Kudüs'teki Aksa camii'nin yeniden inşasını da tamamladı. Velid'in emri ile, Şan'a Ulu Camiiyi genişletmesi daha az hatırlanır. Caminin bugünkü görünen hali, Velid'in zamanından sonra gerçekleştirilen birkaç genişletme ve ilavelerin sonucudur. Her haluklarında, 2006 yılında başlatılan kapsamlı bir restorasyon projesi dahilindeki arkeolojik araştırmalar, erken dönem bir caminin temellerini, duvar kalıntılarını, zeminlerini ve diğer mimari özelliklerini buldu. Dahası, bugünkü caminin yer seviyesi yukarısındaki bazı unsurları (özellikle kible revakındaki kemerlerin tuğla işçiliği), bu aynı binaya aittir. Tarihlendirme kanıtları kesin olmasa da, bina kesinlikle H. 3. / MS 9. yüzyıldan çok önce inşa edilmiştir. Bu nedenle bina, Şan'a Emevi Camii olarak tanımlanmalıdır. Yapı, yaklaşık 58 metre uzunluğunda (kuzey-güney) ve 53 metre genişliğinde (doğu-batı) bir dikdörtgen biçimindeydi. Bina, merkezi bir avlu etrafında düzenlenmiş, en azından üç, muhtemelen dört adet kemerli revak içermektedir. Binanın güney köşelerinin her birinde birer *sawmā'ah* veya minare duruyordu. Kible duvarının ortasındaki geniş bir giriş sundurması ve diğer duvarlara yerleştirilmiş gösterişli kapılar binaya girişi sağlıyordu. Arkeolojik araştırmalar bir mihrap izi bulamadı. Bu binanın mimari düzeni, Emevi camilerinin kanıt çeşitliliğini artırmaktadır.

**Anahtar Kelimeler:** Erken İslami Mimarisi, Emevi Camii, al-Velid, Minare, Yemen.

## Introduction

Architectural historians remember the Umayyad calif al-Walid ibn ‘Abd al-Malik ibn Marwān (r. 86-96 AH / 705-715 AD) for sponsoring construction of the Umayyad Mosque in Damascus, and for re-building the Maşjid al-Nabawī in al-Madīnah; he also completed his father’s re-building of the Aqşā mosque in Jerusalem. These construction projects were important steps in the development of Islamic architecture. Less remembered is the Umayyad mosque in Şan‘ā’.

According to later historical reports,<sup>1</sup> in 6 AH the Prophet Muḥammad ordered construction of the first mosque in Şan‘ā’, in the garden of the Sassanian gover-

1 Notably Aḥmad b. ‘Abd Allah b. Muḥammad al-Rāzī, *Tā’riḫ madīnah Şan‘ā’*, ed. Ḥusayn ‘Abd Allah al-‘Amrī, Dār al-Fikr, Şan‘ā’, 1984, pp. 63, 123 ff.

nor Bādhān. This location is said to have been between Qasr Ghumdān on the east and a rock called al-Mulamamah on the west. Eight decades later al-Walid instructed governor Ayyūb b. Yaḥyā al-Thaqafī to enlarge the mosque. The governor expanded the mosque in the qiblah direction (i.e. to the north) to the location of the “present” qiblah wall.<sup>2</sup> Recent archeological work in the Great Mosque has documented a building that corresponds to al-Walid’s mosque. This building adds to the formal variability of Umayyad mosques, contributes new information to the early history of minarets, and illuminates the spread of architectural techniques between regions in late antiquity.

### 1. Archaeological investigations in the Great Mosque

A major restoration project<sup>3</sup> began at the Great Mosque (Figure 1) in 2006, and continued until unsettled conditions brought the project to halt – perhaps temporary – in 2016. Archaeological investigation of the building was an integral part of the restoration project.

The archaeology team<sup>4</sup> had the dual goals of assessing the Mosque’s structural integrity, and of documenting the history of the Great Mosque and its immediate surroundings. The team undertook three basic activities – excavations within and around the Mosque, documentation of architectural features exposed by removal of wall plaster, and roof openings for repair of ceiling beams. The first two of these activities recorded architectural remains understood to be from the Umayyad mosque of Ṣanʿāʾ.

During the ten years of its activities, the archaeology team made 64 individual excavations plus a dozen small probes inside the Mosque, and six excavations outside it. In order to avoid damaging the Mosque, each excavation was typically only 3-4 sq. m. in area but many reach 3-5m in depth. The excavations document more than sixty floors, plus occasional layers of fill, laid one upon the other in a

2 Al-Rāzī, *op. cit.*, pp. 135 ff.

3 The restoration project is administered by the Social Fund for Development, and funded by the Arab Fund for Economic and Social Development (Kuwait). The present author is the team leader of the archaeology component of the project.

4 The team members are Bakiye Yükmén Edens (assistant team leader), ʿAbd al-Azīz Saʿīd al-Qubaybī, Aḥmad ʿAlī al-Rawḍī, Muṣliḥ ʿAlī al-Qubābī, Bashīr Sulṭān, Burhān Maḥdī ʿAbd Allah, ʿIṣām ʿAlī, Mukhtār ʿAlī ʿAbd al-Rabb, Muṣṭafā Qāsim Aḥmad, and Mājid Ṭaha al-Majayī. I am deeply grateful to all members of the archaeology team, and to all other members of the restoration project, whose hard work created the results reported here.

sequence that is 0.6-1.8m deep across the roofed portions of the Mosque. Many excavations also uncover architectural elements – walls, pillar bases and foundations, blocked doorways, chunks of decorated plaster, etc. – that belong to earlier states of the Mosque. The stratigraphic relationships between the floor sequence and architectural elements exposed in each excavation establish a relative chronology of construction events and structural modifications in the Mosque. Some of the floors and fills are distinctive enough to establish stratigraphic correlations between different excavations. Such correlations are strong within a given section of the Mosque, but they are somewhat less definite across different parts of the Mosque. These correlations form a coherent framework for describing the structural history of the Mosque as a whole. Absolute dating of individual events in this history is more difficult to establish. Even so, the results give a coherent picture of the historical development of the Great Mosque of Ṣan‘ā’, as follows.

The Great Mosque covers remains of pre-Islamic occupation. These remains include architecture that probably was related to the famous Qaṣr Ghumdān, and a large well and water channel that may be identified with al-Karāmah, the well of Qaṣr Ghumdān. Despite common speculation among scholars today,<sup>5</sup> none of the pre-Islamic buildings can be identified as a temple or church, nor are any of them systematically incorporated into construction of the Mosque.

The first mosque, built in the year 6 / 627, is commonly thought to have been in a southern part of Mosque’s footprint today.<sup>6</sup> However, the archaeological investigations have not definitively identified this building. The earliest mosque identified with certainty is the building presented in this study and ascribed to al-Walīd. This

5 For older literature see the discussion in Paolo Costa, “The Great Mosque of Sanaa”, *Studies in Arabian Architecture*, Variorum/Ashgate Publishing, 1994. More recent suggestions include Werner Daum, “Ṣan‘ā’: the origins of Abrahah’s cathedral and the Great Mosque – a water sanctuary of the old Arabian religion”, *Proceedings of the Seminar for Arabian Studies*, vol. 48, 2018. Christian Robin (“La Grande Église d’Abraha à Ṣan‘ā’, Quelques remarques sur son emplacement, ses dimensions et sa date”, *Interrelations Between the Peoples of the Near East and Byzantium in Pre-Islamic Times*, ed. V. Christides, Oriens Academic, Cordoba, 2015, pp. 114-115) has suggested that the Great Mosque was built in the esplanade of Abrahah’s cathedral. The excavation results do not support this suggestion.

6 For example, Ronald Lewcock, G. Rex Smith, R.B. Serjeant, Paolo Costa, “The architectural history and description of Ṣan‘ā’ mosques: the Great Mosque”, *Ṣan‘ā’, An Arabian Islamic City*, eds. R.B. Serjeant-R. Lewcock, World of Islam Festival Trust, London, 1983). This view accords with the popular tradition that the qiblah wall of the first Mosque ran between two pillars named *al-manṣūrah* and *al-manqūrah*, in the south riwāq. These pillars are 12 meters apart, and are marked today by recent inscribed stones.

mosque occupied the area from the present minarets to the present qiblah wall, and from the east edge of the courtyard to the west wall of the present building. The building included structures in the locations of the two present mosques, and it did not include the area now occupied by the south riwāq.

The Umayyad mosque was enlarged to the south by construction of a new south riwāq with four aisles.<sup>7</sup> The present south wall of the Mosque and the southern end of its west wall, together with much of the extant arcading of the south riwāq, belong to this enlargement. Following the southward expansion, the structures in the minaret locations were no longer at the southern corners of the building. The enlargement is not mentioned in the available historical sources, but it was probably executed during the 2nd / 8th century.<sup>8</sup> Subsequently, the then-existing east riwāq was remodeled and the south riwāq was reduced to three aisles; this work occurred probably during the 3rd / 9th century, shortly before the final enlargement of the Mosque.

Construction of the present east riwāq was the final enlargement of the Mosque. The new riwāq extended from the qiblah wall to the south wall, and the vertical joints visible today on the exterior face of these walls mark the corners of the building before the enlargement. This enlargement left the eastern minaret in its present location in the southeast corner of the expanded central courtyard rather than at the exterior wall of the building. At roughly the same time the west riwāq was completely re-built. Construction of the new east riwāq and remodeling of the west riwāq can be dated with confidence to the late 3rd/9th century (see the discussion below).

Later changes to the Mosque were largely adjustments to individual elements inside the building. The qiblah wall was remodeled, probably in the early 6th / early 12th century, and the mihrāb was moved to its present location. The two minarets were rebuilt in Ayyūbid times (late 6th-early 7th / late 12th-early 13th century), and they still retain the appearance created at that time. Many pillars of the north and south riwāqs were replaced, sometimes more than once, after the 3rd / 9th century. The domed structure now within the central courtyard was built in the

7 The new south riwāq replaced a covered structure, perhaps a portico or *zullah*, which had been built against the outside face of the south wall of the earlier building. This structure was built at the same time as, or shortly after, construction of the early south wall.

8 An inscription in the Mosque (now set into the north façade of the eastern library staircase) states that the Abbasid governor ʿAlī b. al-Rabīʿ made renovations to local mosques in 136 / 754 AD. This work possibly included enlargement of the Great Mosque.

early 11th/17th century by an Ottoman governor. The libraries above the south riwāq were added during the 14<sup>th</sup> / 20<sup>th</sup> century during the Ḥamīd al-Dīn imamate.

## 2. The Umayyad Mosque of Ṣan‘ā’

The earliest mosque identified with certainty is a sub-rectangular structure, measuring about 58m north-south and 53m east-west. The north wall followed the line of the today’s north wall as far as the exterior joint that marks the addition of the present east riwāq, and the west wall followed the line of today’s west wall as far as the west minaret. The south wall of the building ran between the north faces of the two minarets; the stub of this wall is now beneath the southern end of the central courtyard. The east wall ran along the east side of the present central courtyard – the joint in the exterior face of today’s north wall and the east face of the east minaret correspond to the outer face of this wall.

Rectangular structures at each southern corner of the building occupied the positions of the Mosque’s two minarets today. The interior of the building was arranged as three, probably four, riwāqs bordered on a central courtyard. The north (qiblah) riwāq was five aisles deep, and the two lateral riwāqs were three aisles deep. The existence and size of a south riwāq remains undetermined.

In the following discussion, the locational terms “east riwāq” and “east wall”, as well as “south riwāq” and “south wall” refer specifically to this early mosque (not the analogous structures in the Mosque today), unless otherwise indicated. Elevation information is cited with respect to the arbitrary 10m baseline of the French photogrammetry program,<sup>9</sup> which produced the base plan of the Great Mosque used in the restoration project. The present floor of the Mosque is at elevation 9.8-10.0 meters.

### Exterior walls

The exterior walls are 1.3-1.8 meters thick. They are faced with regular courses of finely dressed basalt blocks, which encase a core of rough stone and earth. The foundations are structurally identical to the wall proper, but widen with depth in several steps. Many of the facing stones in the foundations are evidently recycled

9 See R. Héno-Y. Egels, “Architectural patrimony management in Yemen”, CIPA 2007 XXI International Symposium, 2007, <https://www.isprs.org/proceedings/xxxvi/5-c53/papers/fp073.pdf>, accessed 22.03.2022.

from older buildings, as shown by fringes of plaster around the edges of some blocks. The foundations typically extend 1.9-2.2m below the first floor of the mosque (described below).<sup>10</sup> The masonry coursing of foundations and the lower portions of the walls proper are bonded at the northeast, southeast and southwest corner of the building (Figure 2; the northwest corner has not been investigated). Similarly, wall plaster is continuous across these corners.

A string of wooden beams ran along the interior and exterior faces of the wall, at the top of the foundations. These two strings were joined at intervals by cross-pieces through the thickness of the walls, to form a structural grid. In most places the wood itself does not survive, leaving horizontal slots 12 cm high and 20cm deep in the wall faces. However, decayed wood was found in the east wall of the building, and elsewhere impressions in wall plaster covering the slot show wood grain and adze marks. The beam slot on the interior faces of the walls is continuous across the exposed corners of the building (Figure 2, right). On the interior face of walls, plaster extends 5-10cm or more below the beam slot, and the first floor of the building runs up to the plaster at a point often 5-15cm above the level of the beam.

The visible exterior face of the north wall was rebuilt at least once, during the 6th century AH, and the exterior face of the west wall has probably also been rebuilt. But the lower portions of the two walls and their foundations belong to the original building.

### **Doorways**

Excavations recorded a total of five doorways in the four exterior walls of the building. However, the entry system remains poorly understood.

Excavations on both sides of the north wall found remains of a doorway placed slightly east of the center-line of the building, below and slightly off-set from the present miḥrāb (Figure 3, right). The doorway is 1.5 meters wide, with plain plastered walls and a stone sill set at the level of the first floor (elevation 8.32; the floor slopes up to the entrance from elevation 8.20). The plaster of the passage was renewed at least once, and as the floor level of the mosque rose a low dais was constructed in front of the entryway. The dais is about 2.4 meters long, 1.6

10 For a detailed presentation of wall and pillar foundations in the Mosque, see Christopher Edens-Bakiye Yükmén Edens, "Foundations of the Great Mosque in Ṣanʿāʾ", *The Great Mosque of Ṣanʿāʾ Conservation Intervention (2005-2015)*, Centro internazionale della grafica, Venice, 2022.

meters wide and 28cm high; it is formed by dressed stone blocks retaining an earth fill and faced with plaster. Subsequently the bottom of the doorway passage was filled with stone rubble, as the footing for the first miḥrāb to be constructed at this location (see below) when the present central north doorway was also first built. The present appearance of the doorway is the result of remodeling probably in the 6th century AH (a dated inscription is above the remodeled entrance); the doorway's original appearance is uncertain.

Outside the present central north doorway, a wall runs northward from the mosque and forms an 'L' with a wall of long finely dressed limestone blocks (Figure 3, left). The latter wall was parallel to the north wall of the mosque, and formed a 1.1m wide space filled with stone rubble. A lime plaster floor at the top of the wall ran to the mosque at elevation 8.28, and a similar floor at its bottom ran away from the building at elevation 7.67. The vertical position of the upper floor corresponds to the doorway inside the mosque, and suggests that stairs led to a probably covered entryway, perhaps 6 meters long, 1.1m wide and 60cm high, at the outside face of the doorway.

Excavation on the east side of the building exposed portions of a doorway opposite the northeast corner of the original courtyard. The south portion of the doorway was destroyed during construction of the present east riwāq. The doorway was more than 1.7m wide, and the east wall here is 1.6m thick. A 20cm high limestone step was set on the first floor of the mosque, against the wood slot at the interior face of the east wall (Figure 4, left). As the floor level inside the mosque rose, the doorway was remodeled by insertion of a limestone sill over the interior wood slot, and by raising the surface of the entryway. The sill ran up to a plastered stone plinth on which sat two engaged pillars at the north side of the passage. One of the engaged columns was made of stone rubble encased in plaster; the other is missing entirely (leaving a semi-circular ring of plaster) and may have been wood.

A second doorway through the east wall was found at the northeast corner of the building (the north wall itself forms one side of the passage). This doorway is only 80cm across, and the north side of the passage was destroyed by remodeling of the north wall. The passage was paved with a large rectangular limestone slab surrounded by small bricks set in plaster (Figure 4 right). The south wall of the passage is formed by a mass of angular rubble fixed with plaster against the body of the external wall. In other words, the doorway was not original, but it was inserted soon after the mosque was built.



Excavation adjacent to the west minaret uncovered the stub of the south wall. The coursing and slot for wood beams on the interior face of the wall were continuous with the north face of the minaret, and an engaged pillar at the northeast corner of the minaret dropped down to the wall stub (described below; see Figure 9). A limestone step was set against the wall stub, on the first floor of the mosque and next to the engaged pillar. These structural relationships strongly suggest that a doorway existed at the east face of the minaret. A doorway at the east end of the south wall may also have existed, but the staircase to the Eastern Library prevents confirmation of this probability.

Excavation at the interior south corner of the present central west doorway exposed elements of an early doorway in the same location. The first doorway here featured an engaged pillar in a recessed niche at the interior corner of the doorway; design of the niche is similar to the obliquely recessed niches at the inner corners of the minarets (described below). Plaster covered the sides of the stone step set on the first floor of the mosque in front of the stone door sill; the plaster joined the bottom of the wall plaster in front of the wood slot. The full dimensions and character of the earliest doorway in this position remain unclear.

Excavation at the west wall of the north riwāq shows that no doorway existed opposite the doorway in the east wall. Similarly, excavation at the east wall in the position opposite the central doorway in the west wall shows that no doorway existed there. These results indicate that the doorway system of the mosque was not symmetrical, and the documentation in hand affords only a partial understanding of the system.

### **Riwāq pillars**

Several different kinds of pillars exist in the Mosque today. In the present east and west riwāqs all the pillars are constructed of several large stones encased in lime plaster. Some pillars in the north and south riwāqs are the same type, but many are re-used pre-Islamic pillars and other architectural elements, or occasionally multi-drum pillars of recent appearance. The pillars that run along three sides of the central courtyard are square stone shafts plus several re-used pillars.

Excavations show that the pillars in the north riwāq sit upon continuous wall-like stone foundations which run east-west below the arcades. The foundation walls are 1.0-1.1 meters wide, and they extend 2.2-3.0 meters below the first floor of the mosque. The east and west ends of the pillar foundations approach or abut the

exterior foundations of the building. The trenches for these foundations were cut from the same surface as for the exterior walls of the building and the tops of the foundations are at elevation 7.83-8.14 (sloping gradually down from east to west).

Pillar bases composed of multiple basalt blocks were fixed to the foundation in a bed of clay, and covered by plaster. In all the examples excavated in the north riwāq, the original pillars on these bases were cylinders about 80cm in diameter and faced with plaster; the plaster facing probably enclosing large rough stones set in lime plaster. Pillars of the same form exist in the north riwāq today, but all of the investigated examples are remodeled, not the original pillar (Figure 5). To be clear about this point, all of the pre-Islamic *spolia* in the north riwāq (and also in today's south riwāq) sit upon stubs of the original pillars.<sup>11</sup> According to stratigraphic evidence, the replacements in the south riwāq were Yu'firid (mid-3rd to early 4th / late 9th to early 10th century) in date, while those in the north riwāq were later.

The lateral riwāqs remain poorly understood. Foundations for the Yu'firid remodeling of the west riwāq completely concealed or destroyed the original pillars. Excavations in the eastern section of today's courtyard did encounter remains of a single pillar. The pillar is a rectilinear (probably square) construction of basalt blocks encased in plaster; the pillar measures at least 85cm to a side. The pillar is stratigraphically tied to the first floor of the mosque, yet it contrasts in form with the first pillars of the north riwāq. The pillar belonged to an interior portion of the early east riwāq (beneath the present courtyard), so the contrast cannot be explained by a position at the edge of the original courtyard. This slender evidence suggests that the lateral riwāqs differed from the qiblah riwāq in appearance.<sup>12</sup>

The area beneath the present courtyard immediately north of the early south wall has not been investigated. As a result the existence and nature of an early south riwāq remains uncertain.

### **Riwāq arcading**

The ceiling of the Mosque today rests upon brick arcading, and architectural evidence strongly suggests that the same was true for the Umayyad mosque. Moreover, some of the original brick arcading above the pillars does seem still extant, even though the pillars in the north riwāq today are not original.

11 See Edens-Yükmen Edens *op. cit.* for detailed examples.

12 The *zullah* outside the south wall of the mosque also had square pillars, but these were smaller (64-68cm to a side), and built of rubble encased in plaster.

Arches of the north riwāq arcading are formed by two courses of brick, a lower course of vertical brick and an upper course of radial brick (Figure 6, left).<sup>13</sup> The bricks average 30cm x 26 x 6cm, and those in the vertical course are often slightly tapered as voussoirs. Bricks of the same size are commonly present in the arcading walls above and between the arches. Areas of arcading repair are clearly distinguished by much smaller (often only 16 x 16 cm) bricks laid in varying patterns (Figure 6, upper right). Vertical brick arches also characterize the existing arcading in the other three riwāqs of the Mosque today. In the present south riwāq the arches follow the north riwāq pattern of lower vertical and upper radial courses of brick, but the bricks are smaller (22-24 x 22-24 x 4cm). In the present west and east riwāqs the arches are formed by two vertical courses and one radial course brick; the bricks themselves are 20 x 20 cm in size (Figure 6, lower right). These differences of detail imply that the riwāq arcading was constructed at three different times.

Epigraphical and stratigraphic evidence (discussed below) shows that the two lateral riwāqs were constructed in their present form in the late 3rd / 9th century. The roof of the present east riwāq is two meters higher than elsewhere in the Mosque, and the arcading is correspondingly higher. When the present east riwāq was built, the arcading arches in the adjacent bays of the north and south riwāqs were remodeled in order to raise the soffits of these arches to a point halfway between the arcading in these two riwāqs and the east riwāq arcading (Figure 6 lower left). The remodeling, which used bricks of the 20 x 20cm format, shows that the arcading existed in the north riwāq before the 3rd century. Moreover, the present south riwāq is stratigraphically younger than the north riwāq (it probably is early Abbasid in date), and the large bricks found in the north riwāq do not appear in the south riwāq. These considerations strongly recommend the conclusion that in its initial condition the north riwāq was an arcaded rather than a hypostyle hall.

When pillars were replaced in the north riwāq, a scaffolding of wooden beams supported the arcading brickwork, and after the new pillars had been installed the protruding ends of the scaffolding were cut flush with the brickwork. This technique left short wood beams at the transition from stone pillar to arcading

13 Following Lancaster's distinction between pitched brick, vertical brick and radial brick vaults (Lynne Lancaster, "Early examples of so-called pitched brick barrel vaulting in Roman Greece and Asia Minor: A question of origin and intention", *Bautechnik in antiken und verantiken Kleinasien*, ed. Martin Bachmann, Ege Yayınları, İstanbul, 2009, p. 371).

brickwork (Figure 5, lower right). The same effect is also visible in the south riwāq, but it is absent in the east and west riwāqs.

Creation of the present west riwāq completely removed the pillars and arcading of the earlier riwāq.<sup>14</sup> Excavations did encounter foundation walls for the original arcading pillars. These foundations run east-west, so the original arcading probably also ran east-west instead of the present north-south arrangement. A system of three east-west foundations also exists under the east side of the central courtyard, but here a north-south system is also present. The latter reflects rebuilding the original east riwāq, when the south riwāq was reduced from four to three aisles.

### **First floor of the building**

The first floor of the building was a robust surface of plaster mixed with gravel. The surface is commonly tinted red by brick dust during creation of the riwāq arcading. This floor appears throughout the north and west riwāqs, and in the area of the east riwāq beneath the present courtyard. The floor was not horizontal – it appears at elevation 8.39 in the southeast corner of the building, and drops to elevation 8.08 in the southwest corner and to elevation 7.99 in the northeast corner. Within the north riwāq the floor drops 15cm from east to west. The floor elevations reflect the gently sloping ground surface over which the building was constructed.

The floor covers fill deposits of two different kinds – fill in the construction trenches for the mosque’s exterior walls and for arcading foundations in the north riwāq, and a sheet of leveling fill within the footprint of the building. The latter fill deposit is commonly 15-25cm thick, but it can be as little as 10cm and as much as 40cm thick as it evened out highs and lows in the topography of the area before construction of the mosque. In most places the leveling fill covers bedded sand and sandy earth; these deposits indicate that the north riwāq, for example, was built on largely open space. In several places, especially around the west wall, the leveling fill covers mud brick collapse which forms stratigraphic levels that sometimes are 80-100cm thick) from walls that had fallen long enough before construction of the mosque to allow development of a weathering surface.

The interior faces of the walls were plastered after the leveling fill had established the intended grade of the mosque interior; typically a shallow trench was dug into

<sup>14</sup> The pillars in the present east and west riwāqs are similar in structure to the original pillars of the north riwāq. These pillars sit upon individual circular foundations of rubble, which may enclose the base and bottom portions of the original pillars in the west riwāq.

the leveling fill along the walls so that the wall plaster could cover the wood beam fitted into the masonry (described above). The first floor was then laid over the leveling fill, abutting the wall plaster and joining the plaster that covered the bases of the arcading piers. The stone steps at doorways were placed on the first floor of the building.

### **The question of “minarets”**

In their present form the present minarets reflect the Ayyūbid rebuilding. Discussions of the pre- Ayyūbid history of these structures have suggested that initially the mosque had no minaret, and that these were added one at a time. Opinions differ about which minaret is earlier and when it was installed.<sup>15</sup> The archaeological results indicate a very different history. Excavations opened the foundations of both minarets on their north faces, and also the east and south faces of the east minaret. The following discussion focuses on the north faces of the two structures and the east face of the east minaret; the south face of the latter structure reflects the Ayyūbid remodeling.

The north faces of the two minarets are mirror images of each other (Figures 7 and 8). As described above, the north foundations of the minarets bond with the foundations of the east and west exterior walls of the building, and both the slot for wood beams and the wall plaster are continuous across these two corners. The first floor of the building runs up to the wall plaster, at elevation 8.39 in the east and 8.08 in the west.

Each structure has a 70cm wide doorway, set around 1.9-2.1m from the interior corner of the building (see Table 1 for a more precise metric comparison). The door sill is 30-40cm above the first floor, on which sits a limestone step up to the door sill. A rectilinear plaster frame, its bottom resting on the step, runs around the doorway. Whether the doorway was arched at its top is not clear. Later modifications truncated the east minaret doorway. The top of an arched doorway, blocked up with bricks, is extant today at the west minaret,<sup>16</sup> about three

15 Finster (Barbara Finster, “Die Freitagmoschee von Ṣanʿāʾ. Vorläufiger Bericht, 1. Teil”, *Baghdader Mitteilungen*, vol. 9, 1978) favors the west minaret as the earlier structure and gives it an Umayyad date; Lewcock et al. (*op. cit.*) suggest that the east minaret is earlier and is a Yuʿfirid construction.

16 Before plaster was stripped from the north face of the minaret, the blocked doorway was visible only as an arched space at the top of the doorway. According to tradition, this space communicates with the tomb of the prophet Ḥanzalah b. Ṣafwān. Historical sources (e.g. al-Rāzī, *op. cit.*, pp. 205 ff., ibn Rustah cited in Lewcock et al., *op. cit.*, p. 128) indicate that the tomb was destroyed during enlargement of the Mosque.

meters above the original floor; but the upper part of the blocked doorway cannot definitely be identified as part of the original entrance,

The inner corner (i.e. northwest corner of the east structure, the northeast corner of the west structure) is around 1.2m from the doorway. Much of this space forms a niche, the interior of which is progressively recessed in three steps diagonally across the corner to the inner face of each structure. The floor of the niche is about half a meter above the first floor. At the west minaret, an engaged column, about one meter wide, framed the southern side of the niche (Figure 9).<sup>17</sup> Plaster of the engaged column and of the adjacent wall of the western structure sits on the rubble core of the south wall of the building. The existence of a stone step against the interior face of the south wall indicates the presence of a doorway at this point (see the doorway discussion above). An analogous arrangement may also have existed at the east minaret.

The form of upper portions of the north face of the two structures is uncertain. The visible north face of the east minaret was completely remodeled by Ayyūbid brick work and more recent stone masonry. The west minaret today has two plastered niches separated by a pair of engaged colonnettes (Figure 9, left). The niches have semicircular arches with plain archivolt. Areas of the niches lacking plaster reveals bricks that are 30cm long and 6cm thick, i.e. a size comparable to bricks in the oldest arcading in the north riwāq and suggestive of an early date for the west minaret niches. However, the stonework at the level of the arches is not bonded with the present west wall of the Mosque, and this section of the minaret may have been remodeled.

**Table 1:** Dimensions of the north faces of the “minaret” structures

	East minaret	West minaret
Exterior wall to doorway	1.83m	2.09m
Width of the doorway	0.70m	0.71m
Height of the door sill above the first floor	0.28m	0.43m

<sup>17</sup> The niche in the west minaret was used as footing for a two-part stone pillar that supports the present north-south arcading in the west riwāq (Figure 7). This element conceals the articulation of the engaged pillar and the recessing within the niche. The niche at the east minaret is filled with stones of a pillar foundation when the original east riwāq was rebuilt in the 3rd / 9th century (Figure 8, lower left). A very restricted horizontal probe confirmed recessing across the niche but did not confirm existence of an engaged pillar.

Height of the floor of the diagonally recessed niche above the first floor at door	0.44m	0.52m
Height of the floor of the diagonally recessed niche above the first floor at inner corner	0.48m	0.57m
Door to inner corner of the north face	1.08m	0.94m
Total width of the north face of the minaret	3.61m	3.75m

Excavations at the east wall of the east minaret show that foundations on this side of the structure were set in a trench that was dug from a ground surface at elevation 8.1 meters, which corresponds to the elevation 8.0 meters at the top of the foundation trench for the south wall of the building just west of the same minaret. The minaret's foundations are continuous with the stonework of its east face, with no obvious evidence of rebuilding (Figure 10, left). A wood beam slot does not separate foundations from upper wall; instead three wood beams are set into the upper stonework of the structure. Brickwork replaces stone above elevation 13.9 meters. Three arched niches framed by pairs of engaged colonnettes appear at elevation 14.0-15.7 meters, just below the ceiling of the present east *riwāq* (Figure 10, right). The niches have slightly horseshoe arches with ribbed archivolt molding; the molding was assembled from multiple pre-fabricated sections. Fragments of such colonnettes and molding found in excavation have impressions of matting on their reverse faces.

Arcading of the present east *riwāq* is set into the eastern corners of the minaret. At the northeast corner of the minaret the arcading truncated a fourth arched niche. This architectural relationship indicates that the niches existed before construction of the present east *riwāq*, and suggests that a frieze of arched niches once decorated the exterior face of the east wall of the building. Brickwork around the arched niches uses bricks that are 26cm long and 6cm thick, which corresponds to the brick size in arcading of the north *riwāq*. At the southeast corner of the minaret a vertical joint separates the brickwork of the present east *riwāq* arcading from the minaret brickwork. This joint, about 4.75 meters from the northeast corner of the minaret, seems to represent the southeast corner of the original building.

The architectural and stratigraphic evidence leaves no doubt that the exterior walls and the two "minaret" structures belong to the same building. This evidence includes the bonding of foundation stonework, the continuity of both the wood frame and the wall plaster across the corners formed by exterior walls and "minaret" structures, the mirror imagery of the north faces of the "minaret" structures,

and the stratigraphic position of the first floor associated with the structures and exterior walls of the building. The two “minaret” structures formed rectangular projections at the southern corners of the building. Including the thickness of the exterior walls of the building, these two structures measured around 5.25 meters east-west and 4.75 meters north-south. Assuming the arched niches of the east minaret to be original, the structures exceeded six meters in height.

### **Question of a miḥrāb**

Al-Rāzī explicitly states<sup>18</sup> that the newly constructed Umayyad mosque contained a miḥrāb. As described above, the earliest documented miḥrāb was created in the opening of the central north doorway into the building. Although the date of this miḥrāb is not well defined, it was considerably after construction of the building – the earliest floor associated with the miḥrāb (at elevation 8.65 meters) was 45cm higher than the first floor of the building, and separated from it by nearly 20 superimposed floors. Stratigraphic correlation with construction of the present east riwāq is difficult, but at the east end of the north riwāq the earliest floor of the enlarged mosque is at elevation 9.33, and the corresponding floor at the miḥrāb must be at a similar elevation. The first miḥrāb here therefore is probably early Abbasid in date. Later remodeling of the miḥrāb moved it 35cm to the west.<sup>19</sup>

The north riwāq has 12 columns in each arcade, creating 13 bays in each of the five aisles. The present miḥrāb is at the eastern side of the central (7th) bay, and the original doorway here is opposite the 7th pillar from the west. Excavations at the qiblah wall found no trace of an original miḥrāb the 3rd, 5th, 7th, 8th, 9th or 13th bay (counting from west to east).<sup>20</sup> If the building did have a niched miḥrāb, the structure most likely was in the 6th bay, 6-7 meters left of the central doorway. But the building may in fact not have included a niched miḥrāb.

A related point may be made here. Al-Walīd’s mosques in Madīnah and Damascus contained an axial transept at the miḥrāb (a feature of many Umayyad

18 Al-Rāzī, *op cit.*, p. 135.

19 Al-Rāzī (*ibid.*, p. 135) states that in the 4th century AH, Yaḥyā b. ‘Abd Allah b. Kulayb (d. 341 / 952-3) ordered demolition of inscriptions around the miḥrāb and replastered it without decoration. This act probably refers to the miḥrāb in this shifted position. Inscriptions on the present miḥrāb include a date of 665 AH.

20 In all these bays the original wall plaster is uninterrupted to a level below the first floor of the north riwāq, implying that the interior face of the north wall was not been rebuilt or deeply repaired. In this situation, the absence of evidence is indeed evidence.



mosques in Syria), and a cupola in the roof above the miḥrāb. The mosque in Ṣanʿāʾ includes a corbelled wood cupola surrounded by four smaller cupola above the present miḥrāb. However, these structures can have no connection to an Umayyad miḥrāb, and the domes are probably not original features of the mosque. Moreover, structural indications of an axial transept do not exist in the mosque. Intercolumnation is regular throughout the north riwāq, and excavation at the pillar on the west side of the miḥrāb bay revealed a typical original pillar replaced by pre-Islamic *spolia*.

### Question of date

The sequence of floors and fill in each excavation and the stratigraphic correlations between excavations establish a framework of relative chronology for the Mosque. Assigning absolute dates to the various architectural events in this framework is much more difficult, because the flooring and most of the fill deposits contain few datable artifacts (which provide a terminus post quem at best).

The most reliably dated events in the framework are the rebuilding of the west riwāq and construction of the present east riwāq. The first floors associated with each event are clearly identifiable and they can confidently be traced across large sections of the north riwāq as well as the present south riwāq. The band of text just below the ceiling of the present west and east riwāqs name Muḥammad b. Yuʿfir, along with the date 265 AH (878-879 AD) in the west riwāq and 270 AH (883-884 AD) in the east riwāq. Numerous historians in addition to al-Rāzī state that Muḥammad b. Yuʿfir brought the mosque to its “present form”.<sup>21</sup>

Some archaeological evidence supports this date. Excavations found more than 45 Abbasid copper coins (*fals*) throughout the Mosque. Legible names on the coins are restricted to al-Muʿtamid ʿalā Allah (caliph 256-279 / 870-892) and his brother al-Muwaffaq bi-llah (d. 278 / 891); in fully legible coins both names appear. The coins are on floors immediately above the floors associated with remodeling

21 The tradition that ascribes the present east riwāq to queen Arwā (al-Sayyidah al-Ḥurrah bint Aḥmad al-Ṣulayhī (d. 532 / 1138) seems to have a relatively recent origin, at least among Yemeni chroniclers. Those writing before the 11th century / 17th century consistently attributed construction of the riwāq to the Yuʿfirids (e.g. ʿUmārah b. ʿAlī al-Yamanī, *Tārīkh al-yaman al-musammā al-mufīd fī akhbār Ṣanʿāʾ wa-Zabīd*, ed. Muḥammad ʿAlī al-Akwaʿ, Ṣanʿāʾ, 1985, p. 58; Muḥammad b. Yūsuf al-Janādī, *Sulūk fī ṭabaqāt al-ʿulamāʾ wa-l-mulūk*, ed. Muḥammad ʿAlī al-Akwaʿ, Wazārah al-Thaqāfah wa-l-ʿIlām, Ṣanʿāʾ, 1993, p. 200; ʿAbd al-Raḥman b. ʿAlī al-Daybaʾ, *Qarrāh al-ʿuyūn bi-akhbār al-yaman al-maymūn*, ed. Muḥammad ʿAlī al-Akwaʿ, al-Maṭbaʿah al-Salafiyyah, Cairo, 1977, p. 121).

of the west riwāq and construction of the present east riwāq. The coins were probably brought into the Mosque with the materials used to repair and/or renew the floors. The stratigraphic locations of the coins do not prove that work on the west and east riwāq dates to the late 3rd century AH, but the stratigraphic concentration of these finds plus the inscriptional evidence leaves little room for doubt.

The first floor of the remodeled west riwāq and of the new east riwāq is 90-110cm above the first floor of the building; in this stratigraphic thickness are 20-35 floors recorded in numerous excavations. This number of floor renewals must represent a considerable if indeterminable span of time. If these floors represent the 170 years between al-Walīd and Muḥammad b. Yu'fir, then on average the floors were renewed every 5-10 years. Given the ephemeral nature of most of the floors in the Mosque, this rate of renewal seems reasonable. The archaeological evidence cannot prove that al-Walīd ordered construction of this building, but it does provide solid grounds for assigning to the building an Umayyad date. At the same time, there are no archaeological grounds for accepting the recent argument<sup>22</sup> that the west minaret incorporates a pre-Islamic monument (the reported pre-Islamic radiocarbon date reflects the old wood effect plus the re-use of architectural wood).

### 3. Summary and discussion

The Umayyad mosque was sub-rectangular, without right angle corners (Figure 11). The north wall was slightly longer than the south wall (estimated 53.4m versus 52.5m), and east wall was slightly longer than the west wall (estimated 58.6m versus 57.1m). These differences were probably not intentional, and the building was not designed to widen toward the qiblah (as al-Walīd's building in al-Madīnah did, according to written descriptions).<sup>23</sup> Entrances to the building existed at all four sides of the building, but their number and arrangement remains uncertain.

The interior space centered on a courtyard with roofed halls on at least three, and probably all four, sides. In the north (qiblah) riwāq five arcades formed five aisles, each with 13 bays. In the two lateral riwāqs three arcades formed three aisles, with nine bays between the north riwāq and the south wall of the building. If a south riwāq existed, it likely also had three aisles. The arcading in all the spaces

<sup>22</sup> Daum, *op. cit.*

<sup>23</sup> Discussed in Ghazi Izzedin Bisheh, *The Mosque of the Prophet at Madinah throughout the First-Century A.H. with Special Emphasis on the Umayyad Mosque*, unpublished Ph.D. dissertation, University of Michigan, 1979, pp. 211, <https://www.proquest.com/docview/302945312/fulltextPDF/D3538FA085E64FB5PQ/1?accountid=15725>, accessed 16.03.2022.

ran east-west, and an axial transept in the qiblah riwāq is not apparent. Although a miḥrāb is said to have made in the original building, its existence is not definite. If a miḥrāb did exist in the north riwāq, it was not in the location of the present miḥrāb.

The initial interior floor was a thick plaster and gravel surface which was tinted red by brick dust. Some of the subsequent floors in the building had a similar character, but most were earth and gravel surfaces with a skin of plaster. Cylinders of rough stone blocks encased in plaster supported brick arcading, on which rested the wooden roof of the covered areas. The pre-Islamic *spolia* present in the north riwāq and elsewhere in the Mosque today were not present in the Umayyad building. As the existing coffered wooden ceiling of the Mosque has been refurbished many times, the form and decoration of the original roof is not obvious; however, the extant ceiling in the north riwāq may be an Umayyad structure.<sup>24</sup> The existence of original arcading brickwork nearly to the height of the ceiling today suggests that the original ceiling was 6.5 meters above the floor (compared to five meters today).

The courtyard seems to have been surfaced with compacted earth and gravel (according to results from a single excavation within the original courtyard). If a south riwāq with three aisles did exist, then central courtyard was 23.9m long (north-south) and 26.9m wide; if no south riwāq existed, then the courtyard was around 35.7m long. It is unknown whether a structure – a fountain or *bayt al-māl* – was in the courtyard.<sup>25</sup>

Two rectangular structures of stone and brick existed at the locations of the present minarets. Including the thickness of the exterior walls of the building, these two structures measured around 5.25 meters east-west and 4.75 meters north-south, and they were at least 6 meters high. The upper brick portion of the structures was ornamented with arched niches. The inner north corner of the structures was arranged with an engaged pillar which bordered on doorways through the south wall.

24 As suggested by Renzo Ravagnan-Maurizio Merlo-Cristina Muradore, “Chronological development of the decorative schemes”, *The Great Mosque of Ṣanʿāʾ – Restoration Project* (2005-2015), Centro internazionale della grafica, Venice, 2022, pp. 113-132.

25 The *qubbah* in the courtyard today was built by governor Sinan Paşa in the early 11th / 17th century. Its location is eccentric within the present courtyard, but laterally symmetrical in the Umayyad courtyard. In all likelihood Sinan’s construction is in the location of earlier structures which existed before the present east riwāq was built.

Fine stonework is characteristic of pre-Islamic architecture in South Arabia, and builders of the mosque drew on this tradition. Construction with a wood framework set in the faces of walls is an element of the local architectural tradition.<sup>26</sup> But other construction techniques used in the mosque are alien to the South Arabian architectural tradition. Hypostyle rather than arcaded halls are typical of pre-Islamic architecture in Yemen, and the only (textually recorded) example of arcading in pre-Islamic Ṣanʿāʾ is the cathedral build by the Axumite governor Abraha in the mid-6th century AD.<sup>27</sup> Similarly, extensive use of fired brick is not characteristic of pre-Islamic architecture across the region. Excavations below the Mosque found remains of stone and mud brick, but not fired brick architecture. These features of the Mosque may reflect a Mediterranean influence.

Other techniques such as vertical brick arches and pre-fabricated plaster elements ultimately have Mesopotamian origins, and both techniques are commonly found in Parthian and Sassanian architecture.<sup>28</sup> The vertical brick arch (and pitched brick vault) was adopted in some Roman architecture in the eastern Mediterranean,<sup>29</sup> and vertical brick arches or vaults appear in Umayyad buildings of the Levant.<sup>30</sup> The horseshoe arches of the niches in the east minaret are a form that also appeared both in Umayyad Syria and in Sassanian Mesopotamia. These construction techniques and forms may have arrived to Yemen from the Levant. Alternatively, the techniques may have been introduced to Ṣanʿāʾ during the Sassanian occupation that started around 575 AD and lasted some 50 years.

The arrangement of the mosque follows the so-called Iraqi or Mesopotamian plan, of an elongated building with a central courtyard surrounded on three or all four sides by covered halls. Early examples of this form include Kūfah and Wāsiṭ in Iraq, and al-Walīd's mosque in al-Madīnah, as well as smaller mosques in Jerash and the Amman citadel in Jordan. This form contrasts with the wide qiblah hall

26 Charles Darles, "L'emploi du bois dans l'architecture du Yémen antique", *Proceedings of the Seminar for Arabian Studies* 40, 2010, pp. 149-160.

27 Barbara Finster, "An outline of the history of Islamic religious architecture in Yemen", *Muqarnas*, vol. 9, 1992, p. 128.

28 For construction technique see Ignacio Arce, "Umayyad building techniques and the merging of Roman-Byzantine and Partho-Sassanian traditions: Continuity and change", *Late Antique Archaeology*, vol. 4, no. 1, 2008, pp. 512, 516-517, 524.

29 Lancaster, *op. cit.*

30 E.g. Qaṣr al-Ḥayr al-Sharqī and Mushattā. K.A.C. Creswell-James Allan, *A Short Account of Early Muslim Architecture*, Scolar Press, Aldershot, 1989, pp. 153, 205.

arrangement of the “Syrian plan”, found at al-Walīd’s mosque in Damascus as well as Tiberias, al-Ramlah, and perhaps al-Aqṣā and Mafjar.

In their metrical review of Umayyad and early Abbasid mosques, Walmsley and Damgaard show that before around 110 / 730, only the mosques in al-Madīnah and Ṣanʿāʾ were longer than they were wide (and thereafter elongated rectangular form became common).<sup>31</sup> The mosques in al-Madīnah and Ṣanʿāʾ share additional features. The qiblah riwāq in both mosques was five aisles deep, and the pillars were stone covered with polished plaster; the miḥrāb at both mosques (if the Ṣanʿāʾ mosque in fact had a miḥrāb) were not placed at the axial midline of the building; the lateral riwāqs were at least three aisles deep, not simply a single aisle portico.<sup>32</sup> Both buildings also had tower-like structures placed at corners of the building.

But the Ṣanʿāʾ mosque was not simply a smaller-scale repetition of the Madīnah mosque. The ceiling of the qiblah riwāq at al-Madīnah rested directly on wood beams set over the pillars, while in Ṣanʿāʾ the ceiling rested on brick arcading. The Madīnah mosque had an axial transept at the miḥrāb, with a cupola over the first bay in front of the miḥrāb; the Ṣanʿāʾ mosque lacked all of these innovative features.

The most striking feature of the Ṣanʿāʾ mosque is the pair of structures in the positions later occupied by minarets. Later modifications leave uncertain the original height and appearance of the structures, and their purpose is not clear. Conceivably they were simply unnecessarily elaborate stairs to the roof. A more attractive interpretation is that these are early versions of the Mosque’s minarets. If the structures were relatively low, they might have been comparable to the four *ṣawāmiʿ* which in 53 / 673 Maslamah famously added to the ʿAmr mosque in Fuṣṭāṭ.<sup>33</sup> If the structures were taller, then they might have been analogous to the four square towers which al-Walīd installed at the corners of his mosque in

31 Alan Walmsley-Kristoffer Damgaard, “The Umayyad congregational mosque of Jarash in Jordan and its relationship to early mosques”, *Antiquity*, vol. 79, 2005, pp. 373-375. In point of fact, Walmsley and Damgaard over-estimate the elongation of the Umayyad mosque in Ṣanʿāʾ – the length:width ratio is only around 1.1:1. After the new (probably early Abbasid) south riwāq was built, this ratio reached 1.45:1.

32 Bisheh, *op. cit.*, pp. 214-216, 219-222.

33 These *ṣawāmiʿ* were entered from the street, not from the interior of the building. Similar “archaic minarets” existed into the 20<sup>th</sup> century (Joseph Schacht, Ein archaischer Minaret-Typ in Ägypten und Anatolien. *Ars Islamica*, vol. 5, no. 1, 1938.

al-Madīnah. According to later written sources,<sup>34</sup> those towers were around 27 meters (55 *dirāʿ*) high and measured around four meters (8 *dhirāʿ*) on each side; the latter number is agreeable close to the size of two structures in Ṣanʿaʿ.

The long debate about the history of minarets has conflated lexicon, form and function. Jonathan Bloom contends<sup>35</sup> that the towers attached to mosques initially had little to do with the *adhān*; rather, they announced the location of the *maṣjid al-jāmiʿ*. Such towers became characteristic of mosques only in early Abbasid times. Before the 9th century, Bloom argues, towers or analogous structures were built with Umayyad mosques only very rarely,<sup>36</sup> and the *adhān* was made from the roof or a low *ṣawmāʿah* on the roof. Al-Walīd's mosque in al-Madīnah is an important exception to this generalization, but these four towers are known only through historical reports. His mosque in Ṣanʿaʿ may offer a second exception which still survives in part.

<sup>34</sup> Cited in Bisheh, *op. cit.*, p. 212, n. 49.

<sup>35</sup> Jonathan Bloom, *Minaret, Symbol of Islam*, Oxford University Press, Oxford, 1989.

<sup>36</sup> Qaṣṭal in Jordan offers an example. The square tower at the corner of the Umayyad mosque at Buṣrā (Syria) is a later addition.

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## Appendices



**Figure 1:** The Great Mosque of Ṣanʿāʾ – left: exterior appearance, from the northeast; right: central courtyard and arcading of the east and north riwāqs, from the southwest.



**Figure 2:** South interior corners of the mosque – left: southwest corner with minaret foundation in center, west wall foundation on right, and wall plaster continuous across the corner (the wood slot is at the top of the partially plastered course of facing blocks); right: the southeast corner after removal of wall plaster, the east wall foundation is in the center and the east minaret foundation is on the right, with the continuous wood slot visible in both foundations; note the bonding of stonework across both corners.



**Figure 3:** Central door in north (qiblah) wall – left: exterior porch structure from the north; right: engaged pillars of the initial mihrāb set on a bed of stones within the original doorway, the sill of which is visible at the bottom of the photograph.



**Figure 4:** Doorways in the east wall – left: doorway into the 5th aisle of the north riwāq, from the east; right: doorway at the northeast corner of the north riwāq.



**Figure 5:** Pillars in the qiblah riwāq – upper left: original pillar below, a pre-Islamic pillar above; upper right: original pillar, base and foundation below, a later base and square pillar above; lower left: extant pillar of rough blocks and pre-Islamic *spolia* encased in plaster; lower right: composite stone and plaster pillar with wood beams.



**Figure 6:** Arcading in the north riwāq – upper left: intact vertical brick lower course and radial brick upper course; upper right: rebuilt arch enclosing remains of the earlier vertical brick soffit; lower left: intact arch to left, rebuilt arch (transition to the present east riwāq) to right; lower right: arcading of the present east riwāq viewed from the north riwāq.



**Figure 7:** Original doorway (blocked with stones) and corner niche in the north face of the west minaret (the pillar visible on the left was inserted onto the corner niche to support arcading of the Yu‘firid west riwāq).



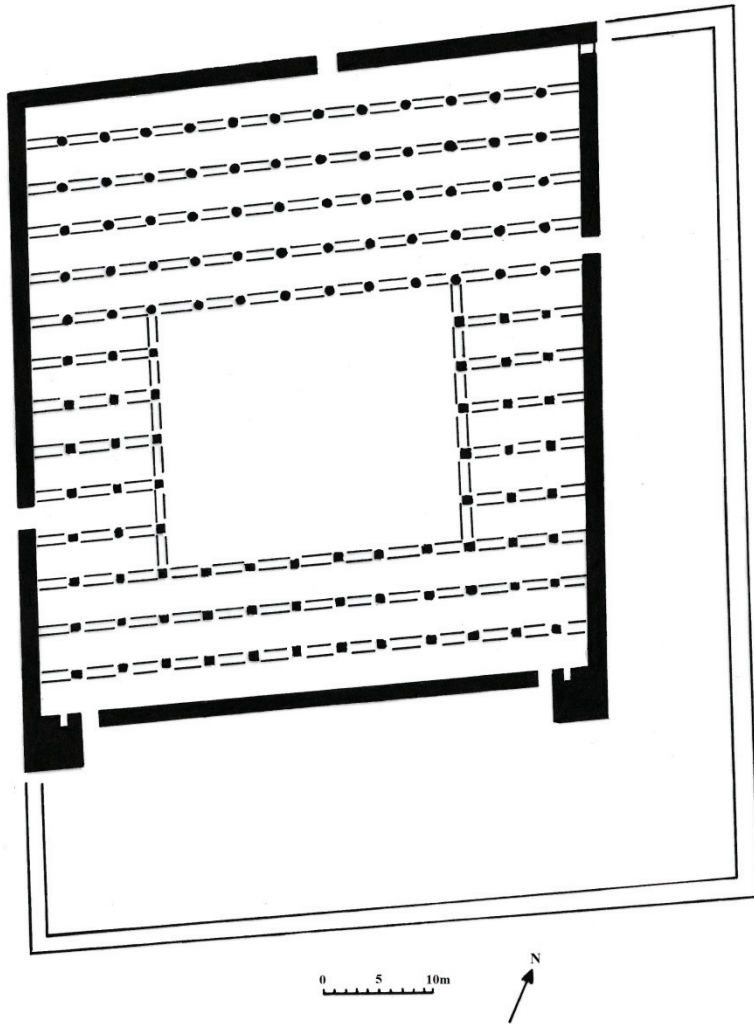
**Figure 8:** North face of the east minaret – left: step and original doorway blocked with stone (note the wood slot at the bottom of the wall plaster); right: the corner niche filled with stones of pillar foundations for the remodeled east riwāq.



**Figure 9:** Northeast corner of the west minaret – left: pre-Islamic spolia supporting west riwāq arcading set against the east face of the minaret, with upper portions of the (original?) engaged pillar exposed to the left (the pair of arched niches and blocked doorway in the north face of the minaret are to the right); right: bottom of the engaged pillar set onto the south wall.



**Figure 10:** East face of the east minaret – left: view from from the south (arcading of the present east riwāq is visible at the left side of the photograph); right: arched niches in the east face of the east minaret, seen through present east riwāq arcading (note the truncated arched niche at the right side of the frieze).



**Figure 11:** Plan of the Umayyad Mosque of Ṣanʿāʾ within the footprint of the Mosque today (this plan assumes the existence of a three-aisle south riwāq, square pillars in the lateral riwāqs, arcading along the lateral sides of the courtyard, and the presence of a doorway next to the east “minaret” mirrored by a doorway next to the west “minaret”; the secondary doorway in the northeast corner of the building is also indicated).

