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Comparative Study of Architecture of the Great Mosque at Samarra, Iraq and Ibn Tūlūn Mosque at Cairo, Egypt

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Abstract

Ever since the emergence of Islam, mosque has always been the most dominant feature in any Islamic built environment. Over the course of time, mosque architecture has gone through a process of various forms of uses and expressions in terms of its transformation. Its style, layout, building form, type of ornamentation used, building materials and construction technology usually provide vital information not only about the practice of Islam in general but also about the timeline, prevailing geopolitical environment, religious conviction, purpose, need and the region in which the mosque was built. This research paper emphasizes the study of the general characteristics of the two earliest examples of mosques in Islamic architecture through extensive literature review. It also highlights the historical and geopolitical context, built form, size, shape, configuration, color, texture, materials used, scale and type of decorative elements of the two most outstanding and heavily restored mosques to date.

Keywords: Islam, mosque architecture, Great mosque Samarra, Ibn Tūlūn mosque Cairo, Construction technology, Calligraphy, Restoration, Decorative elements

Introduction

Prophet Muhammad's (SAW) mosque in Madinah, Saudi Arabia, dating back to 622 AD, is considered to be the holiest and the earliest surviving example after Masjid Haram at Mecca. Prophet Muhammad's (SAW) mosque was an extension to his one room house called "Hujra," a semi enclosed area which was used as a meeting place for visitors and delegates. In addition, this building also served the purpose of a community center and a religious institute.

Initially the Prophet's (SAW) mosque was of very simple form; it was an enclosure of mud bricks without any roofed area inside. There were three entrances at eastern, western and southern walls, the north wall was *Qibla* facing towards *Masjid al-Aqsa*, which was the first *Qibla* of the Muslims. With the change in *Qibla* towards Makkah in the south, the southern entry was bricked up and an entrance was created on the northern wall. An arcaded

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space with roof made of mud and palm leaves supported by columns of palm tree trunks was added to the mosque enclosure that was defining the *Qibla* direction.¹

Later on, rectangular plan forms were developed in which usually the shorter side with ‘*Mihrāb*’ was facing *Qibla* and was always considered most suitable plan form for any mosque. Depending upon the size and proportions of the rectangle versus the capacity for the *namazis*, such a rectangle can be subdivided into a smaller rectangular shaped covered hall having the longer dimensions perpendicular to *Qibla* direction and the rest of the area as open to sky praying court.

The era that started from the 5th century, referred to as the Dark Ages in the Western Civilization, was dazzling in the Islamic World as the Muslim Civilization stretched from Spain to China where major discoveries were taking place in socio cultural, religious, economic, scientific and technological areas.

The two mosques selected for comparative study belonged to the Abbasid period and were constructed in the 9th century AD are located in Samarra, Iraq and Cairo, Egypt. The location map of Samarra is shown in figure 1.² While the location map of Cairo is shown in figure 2.³



Figure 1. Location of Samarra , Iraq



Figure 2. Location of Cairo, Egypt

A roofed arcaded passage on all the four sides inside the boundary wall and ziggurat shaped minaret in brick masonry rising from a square base, are key features of the two

¹Spahic Omer, “Some Lessons from Prophet Muhammad (SAW) in Architecture: The Prophets Mosque in Madinah,” *Intellectual Discourse* 18 (2010): 117-118. Accessed April 19, 2019, <http://irep.iium.edu.my/12874/1/126.pdf>.

²WikiShia: *An Online Encyclopedia of the School of Ahl al-Bayt*, “Samarra,” last modified June 17, 2018, <http://en.wikishia.net/view/Samarra>.

³Worldatlas, “Large Map of Egypt,” accessed January 19, 2019, <https://www.worldatlas.com/webimage/countrys/africa/lcolor/egcolor.htm>.

mosques. Samarra Mosque indicates an architectural landmark located on the boundary of the old city when the city grew eastwards, while Ibn Tūlūn mosque represented as a magnificent extension of a royal palace to accommodate the royal troops. Ibn Tūlūn mosque was the third congregational mosque in Cairo and was the oldest mosque in Egypt that had survived mostly in its original form.⁴

The study aims at documenting various issues how the two mosques compare and contrast with each other.

1.1. Research Question

What are the common similarities and differences between the Mosque at Samarra and The Mosque of Ahmad Ibn Tūlūn?

What are the historical and cultural influences that shaped up the architecture of these mosques?

2. Research Methodology

This research is a thorough study of literature for collecting data in order to make observation for the purpose of analysis. Comparative study is made to examine the similarities and differences between the two mosques and the influences that shaped up the architecture of these mosques. This paper aims to investigate how the architectural characteristics of these two mosques have become shaped up over the period of time.

3. The Great Mosque at Samarra [also known as al Mutawkkil Mosque], Iraq

Baghdad the largest ancient city with its majestic ruins encompassed along the eastern bank of the river Tigris. The city is among the four Islamic Holy Cities of Iraq. The great mosque of Samarra is situated at an archeological site 124 km northwest of Baghdad, Samarra. Baghdad was a powerful Islamic capital city during the Abbasid Caliphate. In the heartland of Mesopotamia, architecture developed under the Abbasid Caliphate during 750-945 AD. Mesopotamian architecture inherit Persian traditions under the Abbasids while later it was influenced by Central Asian styles. A distinctive building ornamentation style was evolved in Abbasid architecture. Although after 850 AD, Abbasid lost control of major areas of their empire but the architectural style they developed, was practiced by successors in Iran and North African countries such as Egypt.

The mosque was built during 848 AD onwards by the Abbasid caliph al-Mutawakkil, while it was initially started by al-Mu'tasim. Al-Mutawakkil relocated to Samarra to avoid

⁴Beautiful Mosques Islamic Historical Places, Beautiful Mosques around the World, "Ibn Tūlūn Mosque, Cairo," accessed January 29, 2019, <http://beautifulmosques.com/mosques/ibn-tulun-mosque.html>.

his conflicts with the Baghdad's local people. He stayed there for 56 years. He built many buildings which include the great mosque at Samarra and many palaces.⁵

The mosque has a central courtyard with rectangular shape planned on a ratio of 3 to 2, having dimensions of 238m x 155m. On the inside, the courtyard is surrounded by arcaded space on all four sides. The covered space to the south had 9 aisles that form the prayer hall. There are 3 aisles on north side and 4 aisles on the other two sides, as shown in figure 3.⁶

To accommodate growing number of worshippers, al-Mutawakkil significantly enlarged it and it was the world's largest mosque at that time. It was designed to hold 80,000 worshippers. The exterior walls, 10 m high and 2.65 m thick, were buttressed on the exterior side by 44 highly dominating semi cylindrical towers that were used at regular intervals to add strength and stability to the wall. Top most part of the wall between the towers incorporated successive squares in a receding pattern as shown in figure 4.⁷



Figure 3. Plan of restored Mosque



Figure 4. Exterior Wall with detailing in between the towers

The Malwiya Tower (figure 5), for which mosque is also known as Malwiya Mosque, is a minaret at the northern end isolated from the mosque. The minaret in the form of a spiraling cone, 52m high and 33m wide and with a spiral ramp, recalls the ziggurat of Mesopotamian architecture.⁸ The ascending spiral conical design of spiral minaret (Malwiya in Arabic) made it a unique minaret. "Malwiya" word is interpreted as "twisted" or "snail shell."⁹ The tower, made of sandstone, was built in between 848 – 852 AD. The spiral contains stairs to have access to the top. A round vestibule, ornamented with eight

⁵Kaushik Patowary, "The Great Mosque of Samarra," last modified August 08, 2014, <http://www.amusingplanet.com/2014/08/the-great-mosque-of-samarra.html>.

⁶Banister Fletcher, *A History of Architecture*, 20th ed., Dan Cruickshank (New Delhi, India: CBS Publishers and Distributors Pvt., 1996), 586.

⁷Beautiful Mosques Gallery, "Great Mosque of Samarra in Samarra-Iraq," accessed July 14, 2019, <https://www.beautifulmosque.com/Great-Mosque-of-Samarra-in-Samarra-Iraq>

⁸Wikipedia, "Great Mosque of Samarra," last modified May 17, 2019, https://en.wikipedia.org/wiki/Great_Mosque_of_Samarra.

⁹John D. Hoag, *Islamic Architecture: History of World Architecture* (Milan: Electa Editrice, 1987).

pointed-arched niches is present at the top of the tower.¹⁰ The tower height has made it practical to use it for the “call to prayer.” The 52m high tower is easily visible from a considerable distance and was probably designed as a strong visual testimonial of the occurrence of Islam in the valley of Tigris. Mathematical idea behind Spiral minaret is a growing and winding pattern in a continuous curve around a central point or axis. In nature, spiral is found in various forms and is often interpreted in the lens of mathematics. For example, mathematicians contend that sea shell produce a logarithmic spiral which links to the golden ratio.¹¹

There are total 16 gates of the mosque to reach the interior arrangement of columns which define the passageway from the exterior walls to the central prayer hall. The columns are placed on a dense grid and supported a teakwood roof.

Malwiya mosque had 17 aisles. The inner walls had panels of mosaics of dark blue glass and cut marble. Stucco work and wall paintings of Malwiya mosque, resembled with palaces of Tajikistan. Later, in the 12th -13th century AD, architecture in the areas that were ruled by the Abbasids became dominated by Seljuk architecture.¹²

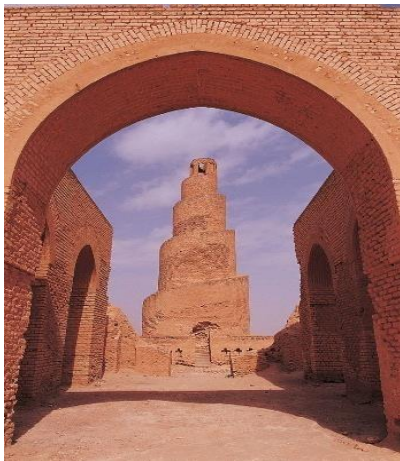


Figure 5. A view of spiral minaret



Figure 6. Mihrab decoration in Floral Stucco

Most of the mosques constructed in Abbasid period had a *mihṛāb* and a niche in the wall facing Makkah. Figure 6 shows a marble *mihṛāb* that had been removed from its

¹⁰Helen Gardner, Fred S. Kleiner and Christin J. Mamiya, 12th ed., *Gardner's Art through the Ages* (Belmont, CA: Thomson /Wadsworth, 2005).

¹¹Ivars Peterson, “Sea Shell Spirals,” *Sciencenews.org* (blog), April 1, 2005, <https://www.sciencenews.org/article/sea-shell-spirals>

¹²Ibid.

original mosque and is now placed in the Baghdad Islamic Museum. The Mosque's art and architecture was influential and floral. The geometric designs used in mosque's stucco carvings, represent the early Islamic ornamentation.¹³

The Minaret, an integral part of the Malwiya Mosque, was originally interconnected to the mosque. For a long time, this mosque was considered the world's largest mosque. In 1278 AD, the mosque was destroyed by the armed forces of the Mongol ruler Halaku Khan during the invasion of Iraq. According to "Doris Behrens-Abouseif," an architectural historian, in 1296 AD the great mosque was restored by Sultan Lajin and the minaret was also constructed by him.¹⁴ Figure 7 shows the Malwiya mosque in its unrestored form.¹⁵ While figure 8 is a sketch of restored form of mosque.



Figure 7. In un-restored form

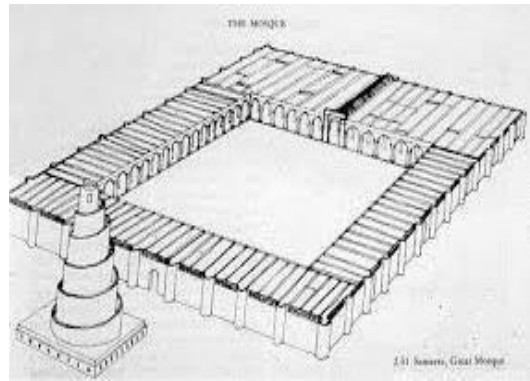


Figure 8. In restored form

The mosque was destroyed in 1278 A.D by Halaku Khan, and in 2006 AD from extensive bombing of the American forces. According to the Iraqi police, in 2005 a bomb damaged the top section of the 52m high Malwiya tower, which had previously been used by US soldiers as an observation post.¹⁶

4. The Mosque of Ahmad Ibn Ṭulūn, Cairo

Being situated in Cairo city, this mosque was the oldest surviving mosque in its original form. It was the largest mosque area in the city. Cairo is famous as; 'The City of a Thousand Minarets.' The mosque was commissioned by Ahmad ibn Ṭulūn; an Abbasid governor of

¹³Doris Behrens Abouseif, *Islamic Architecture in Cairo- An Introduction* (Cairo, Egypt: The American University in Cairo Press, 1998), 51-57.

¹⁴Dennis Sharp, *The Illustrated Encyclopedia of Architects and Architecture* (New York: Whitney Library of Design, 1991), 204.

¹⁵Kaushik Patowary, "The Great Mosque of Samarra."

¹⁶Wikipedia, "Great Mosque of Samarra," last modified May 17, 2019, https://en.wikipedia.org/wiki/Great_Mosque_of_Samarra.

Egypt. The Al-Maqrizi, a historian, wrote that the mosque's construction was started in year 876 AD while 879 AD identifies as the year of completion by the mosque's original inscription slab.¹⁷

The grand mosque with a classical congregational courtyard plan spanning over an area of 5 acres, is a rare surviving example of the 9th and 10th century art and architecture of classical Islamic period. The mosque was intended to be the focal point of Ibn Ṭūlūn's capital "Al-Qatta'i," that served as an administrative center for the Ṭūlūnid dynasty. To this royal city of "Al-Qatta'i," the following myths were attached: firstly, at this site Noah's Ark landed after flood; it was also the site where the Allah had spoken to Moses and also here Moses had confronted Pharaoh's magician. At the back of the mosque was the Ibn Ṭūlūn's palace, and a door adjacent to the *minbar* (platform for address) allowed Ibn Ṭūlūn to directly enter into the mosque.¹⁸

The mosque was built in the Samarran style common with Abbasid constructions. As Samarra was extended quickly over a vast area, an efficient and speedy technique was developed to decorate vast brick surfaces. In Samarran decorations, wooden molds having carved patterns were stamped over wet plaster surfaces. This technique was used under and around the arches and plaster capitals.¹⁹

The Cairo mosque has high outer walls, enclosed on three sides by 162m long narrow forecourts called "Ziyada." The mosque has a central courtyard with dimensions of 92m long sides, surrounded by pillared arcades which are deeper on *Qibla* side.²⁰ Figure 9 shows the mosque plan.²¹ The forecourts between outer and inner walls separated the mosque from the surrounding bazaars and secular buildings. The arches, made of red brick faced with stucco carvings, are pointed. The main prayer niche of marble, the wooden *minbar* and the 5 aisles *dikka* are in front of the prayer hall, which has 5 aisles.²²

The abolition fountain (Sabīl) of the original mosque was present in the space between the inner and outer walls. A Sabīl in the center of the mosque courtyard was added by Sultan Lajīn at the end of the 13th century. A high drum dome on the Sabīl is shown in

¹⁷Doris Behrens Abouseif, *Islamic Architecture in Cairo- An Introduction*, 51-57.

¹⁸Caroline Williams, *Islamic Monuments in Cairo: The Practical Guide* (Cairo: American University in Cairo Press, 2004), 50-54.

¹⁹*Ibid.*, 52.

²⁰Matthias Seidel, and Regine Schulz, *Art and Architecture: Egypt* (Potsdam, Germany: Ullmann, 2005).

²¹Beautiful Mosques Islamic historical places, beautiful mosques around the world, "Ibn Ṭūlūn Mosque, Cairo," accessed February 8, 2019, <http://beautifulmosques.com/mosques/ibn-tulun-mosque.html>.

²²Matthias Seidel, and Regine Schulz, *Art and Architecture: Egypt*.

figure 10.²³ The prayer room was ornamented with long Kufic inscriptions, a form of calligraphy, carved in the wood. figure 11 shows pulpit and *mihrāb*. The mosque comprised two domes and a semi helical shaped 40m high minaret on the outside that was constructed in Abbasid style architecture.

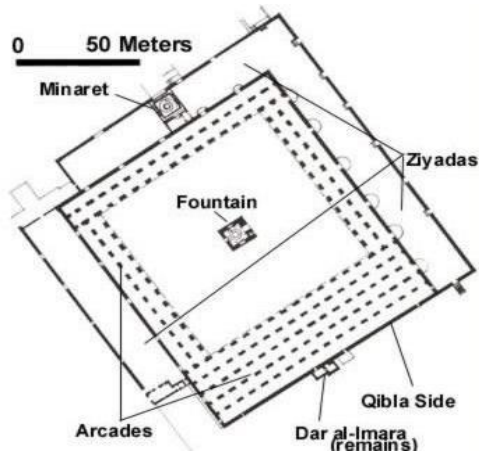


Figure 9. Plan of the Mosque

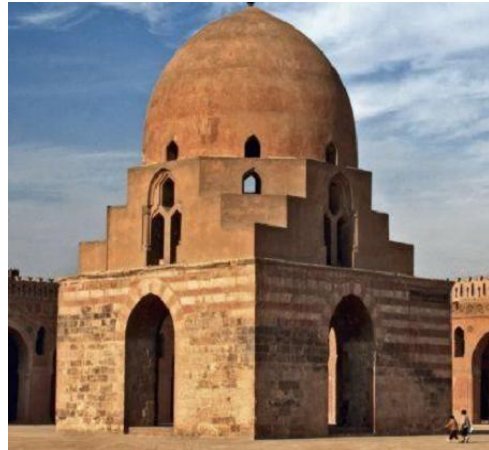


Figure 10. Domed roof over Sabil



Figure 11. Pulpit and Mihrab

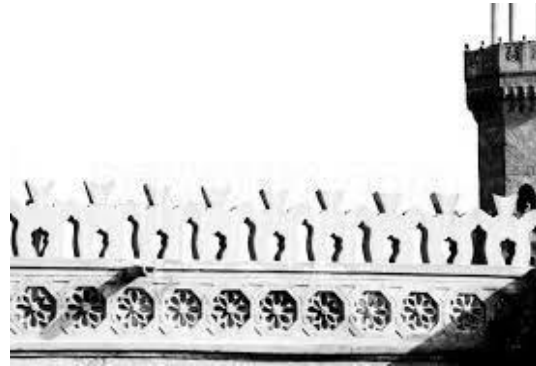


Figure 12. Patterned Parpet Wall over Arcade

The mosque's facade is very simple. The crenellation at top of all of the walls is unique having resemblance with paper cutouts of human figures with linked arms, as shown in figure 12.²⁴ There is a row of windows on the top half of mosque façade while the bottom half is very plain with door openings that lead into the mosque as shown in figure 13.²⁵ The

²³Beautiful Mosques Islamic historical places, beautiful mosques around the world, "Ibn Tūlūn Mosque, Cairo," accessed February 8, 2019, <http://beautifulmosques.com/mosques/ibn-tulun-mosque.html>.

²⁴Ibid., 51.

²⁵<http://www.egypttoday.com/siteimages/Larg/2366.jpg>.

windows have stucco screens with various designs that filter the light to interior spaces. The mosque has 19 doors and 128 windows made of different geometric patterns. It is not known whether these patterns were originally placed in or were from late renovations. The walls made of brickwork with decorative motifs indicate Samarian influence and craftsmanship.



Figure 13. A view of Ibn Tūlūn Mosque



Figure 14. Ziggurat shaped Minaret

Ibn Tūlūn mosque has ziggurat shaped minaret (figure 14).²⁶ The date of its construction is controversial. The helical outer staircase of the minaret of Cairo mosque and the minaret of Malwiya mosque are similar. There is a myth that the minaret was accidentally designed by Ibn Tūlūn himself while sitting with his officials. He absent mindedly wound a piece of parchment around his finger and upon asking, he replied that he was designing minaret for the mosque.²⁷ Various architectural characteristics mark to a later construction, particularly as the minaret doesn't associate well with the main mosque building. Doris Behrens-Abouseif, an architectural historian stated that Sultan Lajīn constructed the current mosque minaret and also restored the mosque in 1296AD.²⁸

The mosque had history of several restorations. In 1177AD, the first known mosque restoration was done under the commands of the Fatimid wazīr Badr al-Jamālī. The most recent restoration was made in 2004 by the Egyptian Supreme Council of Antiquities.²⁹ The mosque restoration was based on the principle of minimal intervention. The mosque's original fabric was valued by eliminating the damage resulted from the previous works. More than 350 people took part in the restoration project. The expertise of foreign experts,

²⁶Jeffrey Rozwadowski, "Mosque of Ibn Tūlūn Cairo, Egypt," accessed January 29, 2019, <https://www.trover.com/d/1Rp43-mosque-of-ibn-tulun-cairo-egypt>.

²⁷Nicholas Warner, and Zahi A Hawass, *Guide to the Gayer-Anderson Museum Cairo* (Cairo: Ministry of Culture. Supreme Council of Antiquities, 2003), 5.

²⁸Nicholas Warner, *The Monuments of Historic Cairo: A Map and Descriptive Catalogue* (Cairo: American University in Cairo Press, 2005).

²⁹Doris Behrens-Abouseif, *Islamic Architecture in Cairo: an Introduction*, 51-57.

along with a broad range of conservation skills and techniques, made significant advances for the conservation practice in the Egypt.³⁰

5. Comparative Analysis

1. Samarra mosque was constructed during 848 AD onwards, while Ibn Tūlūn mosque was built during 876-879 AD.
2. Both mosques have central courtyard planning surrounded by arcaded space on all 4 sides.
3. There is no dome used in Samarra mosque while two domes are used in Ibn Tūlūn mosque especially one over a cubicle abolition space “Sabīl” which is not seen in Samarra mosque.
4. Both mosque have ziggurat shaped minaret borrowed from Mesopotamia, firstly used in the great mosque at Samarra and later on used in Ibn Tūlūn mosque. However the minaret does not blend with the overall architectural character of the mosque as the minaret is not integral part but placed in isolation.
5. The great mosque’s minaret base circle diameter is 33 meters and height is 52 m and having a constant inclination and adequate separation distance between ascending curves for the convenience of the climbing visitors while the height of minaret of Ibn Tūlūn mosque is 40 meters.
6. The Samarra mosque spreads over an area of 9 acres while Ibn Tūlūn mosque spreads over an area of 5 acres.
7. Stucco carvings within the mosque in floral and geometric design indicate that the art and architecture of Samarra mosque were influenced by the early Islamic decorative motifs. Whereas horseshoe arches of the minaret windows and elsewhere show the strong Andalusian influence that was brought from Spain to Egypt by Muslim refugees. The use of arched pendentives for the ‘sabīl’ dome and castellated parapet wall perforated with floral pattern giving it a strong feeling of transparency are some of the distinct architectural features of Ibn Tūlūn Mosque in contrast with that of Samarra Mosque.
8. The interior of the Ibn Tūlūn mosque comprises a vast courtyard 92m on each side, surrounded by rectangular brick piers. Flat wooden roof of the mosque has been supported by brick arcades. On the *Qibla* side, the arcades are 5 bays deep and two bays deep on the other sides. Samarra mosque has 9 aisles on the *Qibla* side and 4 aisle on other two sides.

³⁰Aga Khan Trust for Culture, accessed on July, 14 2019 at <https://archnet.org/sites/6096/publications/9338>

9. Both mosques were built in red brickwork with stucco. Stucco is a material that is made of aggregate, binder and water.
10. The Ibn Tūlūn mosque is surrounded by three outdoor ‘*ziyadas*,’ while there is no ziyada in Samarra mosque.
11. Ibn Tūlūn Mosque strongly reflects Abbasid dynasty (750-1258AD) architectural features. The mosque is influenced by the Samarra Mosque, in terms of minaret, rectangular piers, and the decorative motifs along with many other characteristic features.

Table 1. Comparison of key features of the Two Mosques

Key Features		Samarra Mosque	Ibn Tūlūn Mosque
Location	-	Considered as the largest archeological site which is rather isolated and located in the corner of the outskirts of Samarra, Iraq	Located in a congested part of Cairo’s built environment.
Construction Period	-	848-851 AD	876-879 AD
Building Site Area	-	9 acres apparently part of a large Citadel.	5 acres
Planning Concept	-	Central courtyard with arcaded space on all four sides. The main prayer hall of this arcaded space has 9 aisles.	Central courtyard with arcaded space on all 4 sides. Qibla side comprises 5 aisles and a domed ‘Sabil’ as focal point in the center of the open courtyard
Building form	-	Rectangular building plan with rectangular shaped central courtyard	Rectangular building plan with square shaped central courtyard
Architectural Elements	Minaret	52 m high, very strong large sized ziggurat shaped spiraling minaret rising from a square shaped arcaded base, allowing a panoramic view to the visitors on the northern end and rather isolated from the mosque building but placed on the main axis.	Entire 40 m high minaret is a combination of a large sized cubical base topped by a short Ziggurat shaped and a small conventional minaret on northern side placed slightly offset from the main axis.
	Domes	Great Mosque has no dome	Mosque has two domes

	Ziyada	Great Mosque has no forecourt.	Ibn Tūlūn Mosque has forecourts called 'Ziyada' on all sides except Qibla side.
Boundary Wall	-	Visually a very strong and massive brick wall all around the mosque is buttressed at regular intervals of 16m by half round towers.	Thick outer walls with crenellation at top and no half round towers.
Ornamentation	-	Samarran Style	Samarran Style
Building Materials	-	Brick work with stucco carvings	Brick work faced with stucco with inscribed friezes
Arches	-	Pointed arches	Pointed arches faced with stucco carvings

6. Conclusion

- The various elements of the two Mosques are considered as having received influence from the development of certain features of Western European architecture. The use of pointed arch, the pier, buttressed wall battlements, etc., formed the essential ingredients of the birth of Gothic architecture.
- The Muslim's contribution in World's Art, Science and in other disciplines is remarkable. The buildings built by the Muslims express a rich cultural heritage of Islamic world. These buildings are a representation of the Muslim's significant contributions to the creative 'Islamic Arts and Architecture' and highlight the diversity of artistic expression from the inception of the faith until the present that provides traces the historic development of Islamic states and the Muslim reigns.
- One of the most dominant elements of any Islamic settlement, no matter how small, has always been a *Juma* Congregation Mosque unlike the size of the places of worship in other religions.
- Throughout Islamic history, ever since the emergence of Islam, we have witnessed that while the form and the architectural character of the mosque is always going through various transformations and experimentations. The key components and their spatial inter-relationship as *mihṛāb*, *minbar*, prayer area (covered/semi covered hall, open to sky, semi shaded), abolition space/fountain, primary and secondary entrances, imam's residence (optional) has been constantly maintained.
- It is generally felt that while conducting research with respect to Islamic heritage and its built environment and in an effort to explore the true identity and the basic spirit behind the architectural character of a mosque, we often look towards those models existing in the Arab world or in south/southeast Asia while usually ignoring the rich heritage of the Islamic built environment as observed in the Central Asian states.

- Nevertheless, historical mosque examples have always shown a strong response towards the use of indigenous materials and methods, arts and craft as well as for the environmental control systems. Current global situation with respect to energy crisis demands that while we are exploring unique architectural forms, character, aesthetics and modern materials and methods for the mosques, we should try to strike a balance between the two.
- The Great mosques are generally seen to be spread over a large land area to accommodate large number of worshippers. In addition to it, they depict a mega scale/form, strong aesthetics, ecologically friendly, climate responsive and consciously blending with the built environment.

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