Restoration of Ahmad Ibn Tulun Mosque

*Cairo, Egypt*

Ibn Tulun Mosque is both the oldest and the largest mosque in Cairo. In view of its architectural and social importance, its restoration proceeded according to the principle of minimal intervention, respecting the original fabric while erasing the damage caused by previous works (for example, by removing the earlier cement mortars that had given rise to cracks). More than 350 people were involved in the project. Working with foreign experts, they had the opportunity to gain experience in a broad range of techniques, in the process significantly advancing the skill base for conservation in Egypt.

*Architect:* Committee of Historic Cairo Conservation / Abd Al Moneim

*Client:* Supreme Council of Antiquities, Egypt

*Built Area:* 22'000 m²

*Cost:* US$ 2'484'061
2007 On Site Review Report

by Mohammad al-Asad

Restoration of Ahmad Ibn Tulun Mosque

Cairo, Egypt

Architect
Committee of Historic Cairo Conservation / Ayman Abd Al Moneim

Client
Supreme Council of Antiquities, Egypt

Design
2000 - 2005

Completed
2005
Restoration of the Mosque of Ahmad Ibn Tulun
Cairo, Egypt

I. Introduction

The Mosque of Ahmad Ibn Tulun is one of the most important architectural monuments of Cairo and of the Islamic world as a whole. It dates back to the last quarter of the ninth century, and therefore belongs to the formative period of Islamic architecture. The fabric of the mosque has survived exceptionally well, especially considering its brick and plaster construction, the heavy – sometimes insensitive – uses to which it has been put over the centuries, and its location in a congested part of Cairo.

The forms and carved plaster decorative motifs of the mosque are considered amongst the finest examples of the emergent ‘classical’ Abbasid tradition of Islamic architecture. The mosque was built by Ahmad Ibn Tulun, who was a product of the Abbasid court in Samarra, the royal suburb of Baghdad, and it survives in much better condition than its two prototypes in Samarra, the Great Mosque and the Abu Dulaf Mosque – the largest mosques constructed in the history of Islam.

The Mosque of Ibn Tulun is consequently of extreme historical and artistic importance, and any efforts to preserve it will be followed with considerable interest by anyone involved in the study of Islamic architecture.

II. Contextual Information

A. Historical background

The mosque was built between 876 and 879 AD. Its founder, Ahmad Ibn Tulun (r. 868-884), was appointed as Abbasid governor of Egypt, but soon asserted his independence from Baghdad and established a more or less autonomous dynasty that governed from 868 until 905, even extending its rule beyond the boundaries of Egypt to Syria.

B. Local architectural character

Although it had been a centre of architectural production since ancient times, Egypt had no independent architectural tradition during the early Islamic period. The Mosque of Ibn Tulun exemplifies the imperial architectural tradition that evolved under Abbasid rule. It was not until the late tenth century, during the Fatimid period, that a unique, specifically Egyptian tradition of Islamic architecture came into being.

Both brick and stone were prevalent as construction materials. The Mosque of Ibn Tulun is built of baked brick, with plaster and wood used for decorative purposes. A number of important additions and modifications were made to the mosque during the early Mamluk period, in the final years of the thirteenth century. Stone was introduced in the reconstruction of its minaret and in the domed structure that covers the fountain at the centre of the courtyard. It is also believed that the courtyard was paved with stone for the first time then.
C. **Climatic conditions**

The climate in Cairo is warm year round. Average temperatures range from 18°C in the winter to 36°C in the summer. Summers are not only hot, but also humid. Rainfall is extremely limited and does not exceed 10 millimetres a year.

In this context, it should be noted that the prayer hall of the Mosque of Ibn Tulun is completely open to the courtyard. There are no walls or doors to form a barrier between the two.

D. **Site and surroundings**

The surroundings of the mosque have changed considerably over the centuries. When first built, the mosque was located in the Qata’i’, the royal quarter that Ahmad Ibn Tulun had established along the edges of Fustat, Cairo’s earliest Islamic settlement. The mosque is now the only surviving remnant of that quarter. It also has been argued that the western side of the mosque once bordered gardens and open agricultural land.

As the city grew, the mosque became part of its centre. Today, it is in a relatively low-income and densely occupied district that contains some important landmarks of medieval Cairo, such as the fourteenth-century Mosque of Sultan Hasan and the Cairo Citadel established by Saladin in the late twelfth century. Both are situated to the northeast of the Mosque of Ibn Tulun.

E. **Topography**

The surrounding area is relatively flat, though the mosque itself was built on a rather high platform known as Jabal Yashkur (which may be roughly translated as the ‘mountain of the one who gives thanks’). As the level of the built fabric of the city has risen over the years, the mosque no longer towers over its surroundings.

III. **Programme**

A. **History of the inception of the project**

It was strongly felt amongst those working with the Islamic monuments of Cairo that the Mosque of Ibn Tulun was in need of restoration. It had suffered considerably over the years from periods of neglect and misuse. It also had structural problems, primarily as a result of serious leaks in the water and sewage networks, which had raised the water-table throughout the medieval city and undermined the foundations of many buildings to the point of near collapse. In addition, the plaster decoration of the mosque had suffered from long-term weathering and neglect and required immediate restoration and protection.

B. **How were the architects and specialists chosen?**

The project is carried out under the umbrella of the Ministry of Culture. More specifically, it is part of the Historic Cairo Conservation Project, which has brought together a number of...
enthusiastic and mainly young experts in conservation to protect Cairo’s endangered Islamic architectural heritage. One of the main impetuses for setting up the organisation was the Cairo earthquake of 1992, which caused serious damage to a number of monuments and highlighted the urgent need to protect the city’s Islamic architectural heritage.

The Historic Cairo Conservation Project was formed during the late 1990s. Being directly connected to the Minister of Culture, it has avoided many of the bureaucratic complications which affect public sector projects in Egypt (and which led to the problems of neglect and water-penetration not being properly addressed for decades).

Besides the young and dedicated team, the project involves Egyptian expertise from beyond the public sector, relying on a scientific committee made up primarily of academic experts. It seems that a close relation of constructive cooperation has evolved between the Historic Cairo Conservation Project team and the various local consultants and contractors who are pre-qualified to carry out the design and implementation of the conservation work under its supervision. Each project is developed by the project staff and advisory committee, in cooperation with one of the private sector consultants, and is then tendered out to the list of pre-qualified contractors. An approach has been evolved that ensures a level of consistency and unity across the various projects.

C. General programme objectives

The programme includes addressing the structural problems of the mosque as well as the deterioration of its plaster decoration. In carrying out these tasks, the restoration team has been concerned to safeguard the historical integrity of the monument. Its architectural evolution has been carefully studied, and the history of interventions thoroughly documented. The concept of reversibility is an integral part of the restoration strategy, allowing any interventions that are later deemed historically inaccurate to be easily removed. In addition, there is an emphasis on preserving the ‘aged’ value of the monument rather than carrying out an extensive ‘face-lift’ to provide it with a polished new look. In general, interventions and additions are kept to a minimum so as to preserve the structural integrity and fabric of the mosque.

In addition to these technical issues, the restoration team kept parts of the mosque accessible to worshippers and tourists, even though it would have been operationally far easier to close the whole structure for the duration of the works.

D. Functional requirements

The mosque functions primarily as a place for Muslims to pray, but it is also an important tourist landmark. It has been carrying out this dual task successfully. Tourists visit the mosque throughout the day, but do so without interrupting the prayers in any way. In this sense, the mosque provides a positive example of cultural interaction, giving non-Muslim tourists the opportunity to observe Muslims performing their daily prayers.
IV. Description

A. Building data

The Mosque of Ibn Tulun is a very good example of an early Islamic hypostyle mosque. It occupies an almost square site measuring about 160 metres on each side. The prayer hall is flanked by a 19-metre-wide ziyada, a walled open space that separates the mosque from the surrounding urban fabric and also traditionally contains utilitarian spaces such as ablution areas.

The prayer hall itself features five colonnades arranged parallel to the qibla wall, oriented towards Mecca. The qibla wall faces southeast. On the northwest side, the prayer hall opens directly onto a courtyard measuring 122 by 142 metres. A portico consisting of two colonnades surrounds the courtyard on the three remaining sides.

Two of the project’s best-known features are believed to be the result of later additions carried out by the Mamluk Sultan Lajin (r. 1297-1299). Lajin hid in the mosque during an internal power struggle, and vowed that if he survived the episode he would embellish the mosque. The first addition is the large domed fountain structure at the centre of the courtyard. The second is the mosque’s minaret, with its square base and spiral top. Lajin’s minaret is located off the central axis that runs through the mosque’s mihrab. It is believed to be a reconstruction based on the original minaret of the mosque, which was in turn influenced by the spiral minarets of Samarra’s Great Mosque and Mosque of Abu Dulaf. Both the domed pavilion and minaret are built primarily in stone, while the rest of the structure is of baked brick.

The mosque also has a sabil (a public well) located in the southern corner of the complex. This stone structure is also attributed to Sultan Lajin.

B. Evolution of design concepts

As this was a conservation project, there were no new design elements apart from the ablution and office facilities that were built beyond the boundaries of the complex. The only major addition made to the structure was the paving of the courtyard. It is believed that the courtyard was not originally paved, though historical sources indicate that Lajin paved it as part of his restoration works; this pavement, however, had disappeared. When the mosque was restored by the Comité de Conservation des Monuments de l’Art Arabe in the 1920s, six orthogonal and diagonal paths were laid to connect the prayer hall and colonnade with the domed structure at the centre of the courtyard. The conservation team decided to remove these paths and cover the whole courtyard in stone, in keeping with the additions made by Lajin. They are fully aware that this decision was controversial, given that the original courtyard was not paved. However they point out that the stone paving may easily be removed if required in future, since it rests only on layers of sand, waterproofing and plain lime concrete, and does not incorporate any Portland cement or reinforced concrete. They add that the paving also allows the mosque to handle a much larger number of worshippers on Fridays and during the Muslim holidays.
In addition to paving the courtyard, most of the areas of the ziyada were covered with gravel (again, a completely reversible addition) that allows water to drain down to an open pipe network and from there to the city’s sewage network. A major upgrade of the network is planned in the coming year.

**C. Structure, materials, technology**

An important component of the project has been to address the structural deterioration of the mosque. To deal with the rising water-table, drainage lines consisting of open pipe traps were dug and connected to the city’s main sewage network. Before this, the penetration of water and sewage affected not only the foundations, but also the surface level, even reaching a few metres up into the walls. All of this was threatening the structural integrity of the monument.

In addition, a special high-adhesive mortar was injected in the walls to fill in cracks. A silicon-based damp-proofing was also used. Lime mortar was used between the brick courses. The restoration team has carefully avoided Portland cement and reinforced concrete in all of the restoration works. (These materials were used in the restoration works of the 1920s, with detrimental effects. A mortar containing Portland cement, for example, has a high salt content, and a different strength and elasticity than the bricks that it holds. In contrast to a lime-based mortar, it does not allow the structure to ‘breathe’ or ‘give’, resulting in serious cracks and structural deformations.)

A further challenge arising from the restoration work carried out in the 1920s was how to deal with the reinforced concrete ceiling that had replaced the original timber one (which had by then burned down). A structural survey was undertaken – though it was not an easy task, as the concrete ceiling had been paved over to provide waterproofing, and a false wooden ceiling had been suspended from its base. The survey revealed that a significant structural crack had emerged in the ceiling. Removing the ceiling was not possible in view of the permanence and irreversibility of the construction. The restoration team therefore decided that the most adequate solution would be to install stainless steel clamps to ‘stitch’ the crack.

The same approach applied to the re-plastering of the structure. The existing plaster decorations were documented, mechanically cleaned, strengthened, chemically cleaned and finally provided with a layer of insulation. Whenever new materials were used, a concerted effort was made to duplicate the physical and chemical characteristics of the original.

Modern ablution areas were added in the ziyada in the southern corner of the complex.

**D. Origin of technology, materials, labour force, professionals**

One of the important aspects of the project is that it is primarily a local effort that effectively brings together the skills of Egyptian specialists, technicians, architects, restorers and contractors. It takes advantage of the extensive and impressive talents in conservation that exist in Egypt and, in doing so, supports an evolving Egyptian tradition of conservation that seems to be of a very high standard.
The involvement of foreigners is another interesting aspect of the project. Individual foreign specialists from countries such as Italy, France and Poland were brought in to carry out specific restoration works (such as the restoration of painted surfaces) where it was felt that local expertise was not entirely adequate. The foreigners were paired with local restorers, allowing a transfer of skills. In projects like this, foreign expertise is used when needed, but selectively. This process – being initiated at the recommendation of the scientific committee – also avoids the complex, bureaucratic and time-consuming operation of setting up bilateral agreements between the Egyptian government and a foreign government or international organisation.

V. Construction Schedule and Costs

A. History of project design

The planning for this and similar projects was developed during the 1990s, with a clear plan of action emerging by the late 1990s and implementation generally beginning after 2000. This project to restore the mosque was commissioned in 2000 and completed in 2005.

B. Total costs and main source of financing

The total cost of the project was around 2.5 million USD (113 USD per square metre). This is a relatively small amount considering that the mosque is one of the most important monuments of historic Islamic architecture in the world. It also is a small amount compared to the enormous resources being spent on contemporary construction projects in the region.

The funding for this project is completely local. This is important because it shows that a country such as Egypt, which generally has limited resources, is capable of financing such projects. The Egyptian government is aware that providing the necessary funding for the restoration and maintenance of its historical monuments is extremely important, not only in terms of preserving the country’s heritage, but also from an economic point of view. The city’s medieval and early modern heritage now forms a significant (and growing) part of tourism to Egypt. Preserving this heritage can only boost the country’s tourism sector and help it diversify from the two poles of its ancient Egyptian heritage (which most western tourists visit) or its leisure opportunities (which attract tourists from neighbouring Arab countries, primarily the Gulf). If one spends any time at the Mosque of Ibn Tulun, one will come across a significant number of foreign tourists who come to visit it.

Entrance fees to historic cultural monuments now provide a significant source of revenue that could be used for their conservation and maintenance. Indeed, a good part of this income is now effectively used for such a purpose.

In addition, these conservation projects are creating decent and sustainable employment opportunities for the cadres of trained restorers that exist in Egypt.
C. **Maintenance costs**

The contractor is responsible for carrying out maintenance work on the project. A yearly budget of 16,000 USD (100,000 Egyptian Pounds) is allocated for this task.

VI. **Technical Assessment**

A. **Functional assessment**

The mosque is used as a place for prayer and also as a tourist site. It performs both functions adequately.

B. **Climatic performance, response to environment**

Not applicable.

C. **Response to treatment of water and rainfall**

As mentioned above, providing waterproofing and dispersing the accumulated water and sewage were primary challenges of the project, which it seems to have addressed effectively.

D. **Response to, and planning for, emergency situations**

Mindful of the earthquake that hit Cairo in 1992, a good part of the intervention was directed at strengthening the structural system of the Mosque of Ibn Tulun to give it greater resistance to earthquakes.

E. **Ageing and maintenance**

Two years after its completion, the project remains in excellent shape. As mentioned above, the contractor is responsible for carrying out maintenance on the project.

F. **Impact of the project on the site**

One of the main challenges facing the conservation efforts is that almost all of Cairo’s historic monuments are located in areas of informal settlement that suffer from serious problems of overcrowding, poor municipal services, pollution and poor building practice. The project team is aware of this problem and is trying to address it in various locations (such as al-Mu‘izz Street, where the whole infrastructure is being revamped and the street is being closed to traffic). The team members hope that these restoration projects will create the seeds for positive development, encouraging local people to take better care of their surroundings. In fact, there are a few signs that this is beginning to happen, even though much work still needs to be done to address the socio-economic conditions of these neighbourhoods.

It is hoped that the restoration of the mosque will provide a positive example that will lead to a general upgrading of the area around it. This is something that is definitely happening at the Malmuk Taz Palace nearby, which has been restored and given a new use as a cultural centre.
The centre hosts various free cultural activities, including exhibitions and performances of music and theatre. Interestingly enough, these are attended not only by those who follow the cultural scene in Cairo, but also by local residents who otherwise would not get the chance to participate in such activities.

G. *Durability and long-term viability of the project*

So far, it seems that adequate maintenance is provided to ensure the long-term durability of the project.

H. *Interior design and furnishing*

The project has emphasised the concept of minimal intervention. Accordingly, almost no such additions have been made.

VII. *Users*

A. *Description of those who use or benefit from the project*

The project addresses many groups. For the local, primarily low-income population, the mosque is a main centre of prayer. However the mosque occupies an important position in the consciousness of all levels of Cairo society. It is the most intact of Cairo’s old mosques (the Mosque of ‘Amr is older, but much altered). It also is the largest mosque in Egypt. In addition, it is important in the context of the history of Islamic architecture – and will be visited by anyone with an interest in Cairo’s Islamic heritage.

B. *Response to project by clients, users, community*

The project has been the subject of considerable controversy. It was fiercely attacked in its early stages by a number of people involved in the conservation of Cairo’s Islamic architectural heritage, both local and foreign. Some of these attacks were based on a fear that it would repeat the mistakes of the insensitive conservation works that were carried before the establishment of the Historic Cairo Conservation Project. The restoration team insists, however, that their work adheres strictly to internationally accepted conservation practices.

In addition, it should be mentioned that the restoration of a monument with such a high historical and artistic value will be scrutinised very carefully, and it will be difficult to please all observers. Even if a sizeable number of specialists are completely satisfied with the work, there will always be some who consider that it has not adhered closely enough to the conservation guidelines.

Nor should be ignored the level of political infighting amongst those (both Egyptian and foreign) who are involved in the conservation of Cairo’s Islamic architectural heritage. The criticism of restoration projects may often be explained within the context of such squabbles.

Interestingly, public criticism of the restoration project seems to have subsided over time. A symposium was organised in 2002 by the Ministry of Culture in association with UNESCO to
discuss the issues affecting the conservation of architectural heritage of medieval Cairo and to address any fears regarding ongoing projects. It seems that the symposium defused a number of the attacks to which this and other similar projects had been subjected.

It is difficult to gauge popular reaction to the project. It seems, however, that the restoration has encouraged more people to visit the mosque than before.

The local community in turn seems to be very happy with the project since it has upgraded the area without causing major disruption to their lives.

VIII. Persons Involved

The project seems to reflect a good example of teamwork and team spirit. The Minister of Culture seems to be a major force behind this project and other similar works aimed at restoring historic Cairo. The Historic Cairo Conservation Project team – under the umbrella of the Ministry of Culture and leadership of Ayman Abd Al Moneim – carried out the work on the ground, while the project’s scientific committee provided the methodological direction. Work on the ground was carried out by a large group of specialists from the project team, including Tariq Al Murri, Wagdi Abbas (site inspector), Mohammad Abd al Hamid (site engineer) and Mohammad Yassin (site conservator). Another important aspect is that the private sector contractor who carried out the work, the Aswan Company, headed by Ahmad Hanei Mansour, functioned as an integral part of the team, and the client and the contractor engaged with each other in a very positive manner.

IX. Bibliography

Historic Cairo Conservation Project. Masjid Ahmad Ibn Tulun [The Mosque of Ahmad Ibn Tulun], Cairo: Ministry of Culture, 2004 (in Arabic)

It should be mentioned that whenever the Historic Cairo Conservation Project completes a restoration, it publishes a monograph or a brochure as a document of the work. The above monograph on the Mosque of Ibn Tulun is an example of this, and it provides a great deal of information about the monument and the conservation process.

Mohammad Al-Asad
May 2007
View of Minaret and courtyard.

View of courtyard from Minaret.
View of domed fountain structure in centre of courtyard.

View of Minaret and nortwestern Ziyada.
View of entrance leading to northeastern Ziyada.

Detailed view of mosque crenellations.
Detailed view of courtyard portico.

View of courtyard from courtyard portico.
View of Minaret from courtyard.

View of Minaret from southeastern courtyard portico.
View of dedicatory inscription along third colonnade of prayer hall.

View of mosque’s Fatimid Mihrab, located along second colonnade of prayer hall.
View of mosque’s Minbar and main Mihrab.

View of prayer hall’s Qibla wall.
Night view of Minaret from courtyard.

View of northeastern Ziyada.
View of effects of dampness as well as sewage and water seepages on wall of monument.

View of stucco decoration along courtyard portico.
Detail of restored stucco work in arch soffit.

Detail of restored stucco work in arch soffit.
Detail of wooden decoration in mosque.
**Restoration of Ahmad Ibn Tulun Mosque**

Qal‘at Al Kabsh, as-Saliba Street, AL Khalif
Cairo, Egypt

<table>
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<th>Architects</th>
<th>Committee of Historic Cairo Conservation / Abd Al Moneim Cairo, Egypt</th>
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**Programme**
Bhop Tulun Mosque is both the oldest and the largest mosque in Cairo. In view of its architectural and social importance, its restoration proceeded according to the principle of minimal intervention, respecting the original fabric while erasing the damage caused by previous works (for example, by removing the earlier cement mortars that had given rise to cracks). More than 350 people were involved in the project. Working with foreign experts, they had the opportunity to gain experience in a broad range of techniques, in the process significantly advancing the skill base for conservation in Egypt.

**Main problems faced the Mosque:**
1. Deterioration of stucco windows and decoration.
2. Attack of sub-surface water caused walls deterioration due to salts in the raising water in the walls.
3. Deterioration of plaster and rendering due to salts.
4. Deterioration of masonry of the walls.
5. Deformation in the pillars due to soil expanding.
7. Deformation in the dome of the Mihrab due to deterioration of its wooden beams.
8. Deterioration of the wooden Minbar.
9. Deterioration in the wooden ceiling due to the lack of the isolation in the roofs.
10. Deterioration of the stone corning.
11. Many arches were rendered using cement based plaster.

Ahmad ibn Tulun built this mosque on Yashkur hill in al-Qata‘a in 263-5 A.H./876-9 A.D. In the year 2000, the Historic Cairo Project started its conservation project. The building had many problems on the level of architecture, structure, environment and decoration. There was different phases of restoration in its long history. This project aimed to conserve the mosque, preserve its authenticity and its historic evolution. The main philosophy was the minimal intervention. Which was applied in two main concept, re-treatability and compatibility. To achieve this aim, a complete documentation phase was the base of the work. Not only architectural documentation but also the material analysis as well as soil investigations and structural analysis.
The Main Conservation Operation

1. Protecting the mosque from sub-surface water by open-pipe traps, and by injection of silicon base material in the lower part of the walls.
2. Replacing the cement base plaster with lime base plaster compatible with the original materials.
3. Cleaning the original rendering of the facades and preserving its current state.
4. Cleaning and restoring the stucco windows and decoration.
5. Injecting the walls by lime base injection to improve the behavior of the structure.
6. Cleaning and restoring the wooden elements and its decorations.
The History of the Mosque

This mosque was built for Ahmad ibn Tulun. He was sent to Egypt in 868 as governor of al-Fustat, but within two years he had been made governor of the whole country. Shortly thereafter, by refusing to send the annual tribute to the Abbasid court, he established himself as an independent ruler of the province. His family ruled in Egypt for 135 years, until 1005. Ibn Tulun founded a new royal city on an outcrop of rock called Jabal Yashkur near the Qasr al-Nil, a point on the northeast coast of al-Fustat. The city that Ahmad ibn Tulun built was called al-Qatta', descriptive of the allotments in which each group of his followers settled. In 905, when the Abbasids re-established control, the city was destroyed and plowed under. Of its magnificence and scale, all that survives is the mosque that formed its center. The mosque served as the new congregational mosque, replacing the Mosque of Amr, which was too small to accommodate the people of Ibn Tulun. Directly from his palace, or Dar al-Iman, which once stood adjoining the mosque on the qibla side, Ibn Tulun could enter the sanctuary via a door to the right of the minbar. This mosque was used for Fatimid ceremonies during the month of Ramadan. It was damaged when used as a shelter for pilgrims from North Africa to the Hijaz in the 12th c. but restored and refounded with maysara-type functions by al-Qaim al-Din Sanjar al-Dawadar at the behest of Malik ibn al-Sultan Lajin in 1296. Lajin had been one of the assassins in the assassination of Sultan al-Ashraf Khalil ibn Qalawun, and while hiding in the deserted mosque, he vowed to restore it should he escape. The mosque is a rare architectural expression of the cultural hegemony at Samarra, Ibn Tulun’s home. It is built entirely of well-red brick faced in carved stucco, has styaedas and a roof supported by arcades on piers. The present off-center, spiral stone minaret with a maysara mihrab (the ribbed horn) carried on an open octagonal structure is a rebuilding by Sultan Lajin in 1296. The ablution fountain and dome were built on the site of the fawara or fountain built by Ibn Tulun and destroyed by him in 906. The fawara, whose function was purely decorative, was housed in a pavilion comprising a dome carried on gilded marble columns. The original ablution facilities and a clinic were housed in the siyada for hygienic reasons.
Architectural Conservation

- Isolation of the Sahn and stone paved
- Restoration of flooring and roofing
- Injection of walls with lime base injection and preserving original plaster
- Restoration of the Qibla wall and the Minaret
- Stitching the roof crack by stainless steel clips
- Collecting of sub-surface water by perforated pipes system
- Restoration of the Sabil-Kuttab Lajin, and excavating its Cisterns
- Structural repair and restoration for the timber beams and structure of the Mihrab dome
- Landscaping

The Conservation of Ahmad ibn Tulun Mosque

Electro Microscope for a plaster sample

XRD for Plaster sample

Plaster sample Elec M shows animal fibers
Aga Khan Award for Architecture

ARCHITECT’S RECORD
2007 AWARD CYCLE

I. IDENTIFICATION

Project Title: The Conservation of Ahmad Ibn Tufan Mosque
Street Address: Qal‘at Al Kabsh, as-Saliba St, AlKhaliq
City: Cairo, Country: EGYPT

II. PERSONS RESPONSIBLE

A. Architect/Planner

Name: Consultant Committee of Historic Cairo Project
Mailing Address: 2, Shager El-Din St, Zamalek
City: Cairo, Postal Code: 11511
Country: Egypt, Telephone: +20 (2) 2133138
Fax: +20 (2) 7366531, Email: info@sca.org.eg

B. Client

Name: Supreme Council of Antiquities
Mailing Address: 3, Al Adil Abu Bakr
City: Cairo, Postal Code: 11511
Country: Egypt, Telephone: +20 2 7382761
Fax: +20 2 7362239, Email: info@sca.org.eg

C. Project Associates / Consultants

Please list those involved in the project and indicate their role and areas of responsibility (e.g., engineer, contractor, specialist, consultant, etc.). Please write addresses and telephone numbers separately.

Name: Consultant Committee of Historic Cairo Project
Role: Consultant; Site Supervision

Arwan Company: Eng. Ahmed Hany Mansour
Role: Contractor

Wagdi Abbas
Role: Site Inspector

Muhammad Abd al-Hamid
Role: Site Engineer

Mohammad Yassin
Role: Site Conservator
III. TIMETABLE

(please specify year and month)
A. Commission
   2002, March
B. Design
   Commencement: 2000, March
   Completion: 2005, June
C. Construction
   Commencement: 2000, June
   Completion: 2005, June
D. Occupancy
   2005, August

Remarks, if any

IV. AREAS AND SURFACES

(please indicate in square meters)
A. Total Net Area: 22000 m^2
B. Gross Floor Area: 22000 m^2
C. Total Combined Floor Area: 22000 m^2
   including basement(s), ground floor(s) and all upper floors

Remarks, if any

V. ECONOMICS

(please specify the amounts in local currencies and provide the equivalent in US dollars. Specify the date and the rates of exchange in US dollars at the time)

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<td>E. Actual Cost</td>
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   (per sq meter)

Remarks, if any on costs
VI. PROJECT DESCRIPTION

This mosque was founded during the reign of Prince Abu 'Abbas Ahmad ibn Tulun. For more than a thousand years, it has been one of Cairo's major religious and cultural hubs.

Ahmad ibn Tulun built this mosque on the site of the old Fatimid Mosque of al-Mahmyia. He also established a market for agricultural products on both sides of the Qattanin wall, but these markets later collapsed.

Although the mosque of Ahmad ibn Tulun was built on a slope, it did not escape the detrimental effect of the subsurface water that seeped from the drainage network serving the surrounding area. This led to a rise in the moisture and salt content in the walls and pillars and in the appearance of salt efflorescence on the surface. Furthermore, the previous cement restorations led to the development of cracks. This was due to the difference in the modulus of expansion and elasticity between the new cement mortars and the old lime-based mortars. Furthermore, the walls suffered from buckling and deformation and the wooden structure carrying the dome was in a state of structural failure. The wooden ceilings were also in a very bad structural condition as a result of rainwater seepage and cracks ran through the building, especially through the concrete ceiling.

Studies were conducted to assess the condition of the mosque. Mathematical simulations studies revealed a number of basic defects that were tackled in parallel with the conduct of excavation works. The excavation uncovered the abutment of the wall of Sultan Qalawun that had been annexed to the western façade of the mosque, as well as the façade abutment of the western tip of the northern façade.

While the use of the mosque as a main place of worship has been retained, the main Sahn was isolated and paved with sand to provide more space for prayer. The Tulun Mosque is the largest mosque in Egypt and many Muslims consider it as a spiritual landmark. Its preservation is reversible and not needing any value elements. On the other hand, it is preserving the main authentic value of the monument.

The design of the floor and arches were injected and pointed using wooden beams and the walls were reinforced with chemical damp proof. The newly added tiles were removed, and the cracks of the concrete ceiling were stitched using iron clips of 13 mm diameter. The cracks were also covered with a mortar of high adhesive strength. As for the doors and the sub-floor filled damp proofing was inserted below and the work was taken to replace the original tiles to their original position. Furthermore, a drainage system for the disposal of rainwater was introduced. The restoration of the wooden and the stucco elements was accomplished and initiated operations in which the international as well as Egyptian expertise was employed. The result was the restoration of the only remaining monument of the city of al-Azhar.

VII. MATERIALS, STRUCTURE, AND CONSTRUCTION

The building was built in wall bearing system. It was built from bricks, the main materials used in the conservation are:

- Lime Stone tiles
- Lime mortar (lime: sand 1:3)
- Gypsum
- Lime base injection
- Silica base injection for damp proofing
- Timber as structural elements and ties
- Old bricks
- Bricks dust
- Natural 15th
VIII. PROJECT SIGNIFICANCE AND IMPACT

The Mosque of Ahmad ibn Tulun is considered as the largest and oldest Islamic mosque in Cairo. It has a great spiritual value in the heart of the Muslim people. On the other hand, the building is considered as the masterpiece of Islamic Architecture in the world. So it has huge architectural and social value. One significant of the project is concept of minimal intervention and preserving the authentic elements. While there was many additions made negative impact by previous restoration in the last century, this operation tried to remove any addition that could harm the building. The concept was not to improve the human resources in the area of conservation in Egypt by taking the advantage of importing experts and exchange the experiences with them. More than 350 personnel worked in the project had a great experience and different levels of work, learned how to work within a multidisciplinary group of different aspect and profession.

The main impact is the mosque started again in its role, enlightens the society and perform again its praying in the largest mosque in Cairo.

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Name (please print) Ayman Abd Al-Moneim
Signature Ayman Abd Al-Moneim
Date 30-6-2006
### Materials Identification Form

Provide a full list of all material being submitted.

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<td>The minaret from inside the ziyada by night</td>
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