



The Aga Khan Award for Architecture

ARCHITECT'S RECORD

CONFIDENTIAL

I. IDENTIFICATION

Project Title MOSQUES OF SAUDI ARABIA - A SERIES OF MOSQUES WHICH ARE PART
OF A PROGRAMME FOR THE RE-INSTATMENT OF ISLAMIC ARCHITECTURE
Street Address _____
City MEDINA AND JEDDAH Country SAUDI ARABIA
Telephone _____ Telex _____

II. PERSONS RESPONSIBLE

A. Architect ABDEL WAHED EL WAKIL
Mailing Address Pleasant House, 29 Mount Pleasant
City LONDON WC1X 0AP Country U.K.
Telephone [01] 837 7252 Telex 965869 WAKIL G

B. Client MINISTRY OF HAJ AND AWQAF
Mailing Address P O BOX 2583
City RIYADH 11461 Country SAUDI ARABIA
Telephone 401 2345 Telex 201603

C. Consultants (e.g. Economists, Sociologists, Demographers, Engineers)
Name Supervision - CONCENTER
Mailing Address P O BOX 7914
City JEDDAH Country SAUDI ARABIA
Telephone JEDDAH 665 8352 Telex 601876 MASJED

D. Contractor BINLADEN ORGANISATION
Mailing Address P O BOX 1470
City MEDINA Country SAUDI ARABIA
Telephone 822 3300 Telex 570080 sj

E. Master Craftsman SEE ATTACHED SHEET FOR LIST
Mailing Address _____
City _____ Country _____
Telephone _____ Telex _____

III. USE

- A. Specify type(s) of Use: RELIGIOUS
- B. User/Occupant WORSHIPPERS
1. Occupation/Profession: GENERAL PUBLIC
2. Income Level (check one) _____ High _____ Medium _____ Low _____ Mixed
- C. Specify any change(s) between planned and actual use:

IV. PROJECT TIMETABLE

(Please specify year and month)

- A. Design: Commencement FROM 1980 Completion AN ONGOING PROGRAMME
- B. Construction: Commencement _____ Completion _____
- C. Date of Project Occupancy _____

V. PROJECT ECONOMICS

(Please specify amount, currency and date of transaction)

- | | Amount | Currency | Date |
|---|-------------------------------------|----------|-------|
| A. Total Initial Budget | PLEASE REFER TO ATTACHED DATA SHEET | | |
| B. Total Actual Costs | _____ | _____ | _____ |
| C. Actual Cost per sq. m. | _____ | _____ | _____ |
| D. Analysis of Costs | REFER TO ATTACHED DATA SHEET | | |
| 1. Land | _____ | _____ | _____ |
| 2. Infrastructure | _____ | _____ | _____ |
| 3. Labour | _____ | _____ | _____ |
| 4. Materials | _____ | _____ | _____ |
| 5. Professional Fees | _____ | _____ | _____ |
| E. Cost Comparison | REFER TO ATTACHED DATA SHEET | | |
| 1. Please indicate how the costs of this project relate to typical building costs in the country (check one): | | | |
| _____ Average _____ Above Average _____ Below Average | | | |
| F. Sources of Funds | | | |
| 1. Please indicate the percentage of funds that came from: | | | |
| _____ Private Sources _____ Public Sources | | | |
| 2. If funding was public, what percentage was from: | | | |
| _____ local _____ national _____ international sources | | | |

VI. CONSTRUCTION DETAILS

A. Site and Building Area (please indicate in square metres)

1. Total Site Area : REFER TO ATTACHED DATA SHEET
2. Total Ground Floor Area : _____
3. Total Combined Floor Area (including basement(s), ground floor(s) and all upper floors) : _____

B. Construction and Technology

1. Describe the structural system and the basic method of construction
2. Indicate which major building parts were fabricated on-site and which were fabricated elsewhere

C. Description of Materials

(please also indicate if locally produced or imported)

1. Foundations

REINFORCED CONCRETE

2. Principal structural members

LOAD BEARING BRICK

3. Infill

4. Rendering of Facades or Exterior Finishes

PLASTER RENDERED WITH CEMENT

5. Floors

MARBLE OR TERRACOTTA

6. Ceilings

ON SITE CARVED PLASTER FOR FLAT CEILING

7. Roofing

VAULT AND DOME IN BRICKWORK

8. Other elements (please specify)

D. Type of labour force (please indicate percentage)

_____ Skilled Workers _____ Unskilled Workers

E. Origin of labour force

_____ Domestic _____ Foreign

VII. GENERAL GEOGRAPHY AND CLIMATE

A. Please describe the local geographic characteristics:

SAUDI ARABIA

MEDINA AND JEDDAH

B. Please describe the local climatic characteristics:

HOT DESERT CLIMATE

VIII. EVOLUTION OF DESIGN CONCEPTS

Please describe the history of the project, from its conception to its final construction and actual use.

SEE ATTACHED DATA SHEET

عبد الوكيل
EL-WAKIL ASSOCIATES

ARCHITECTURAL CONSULTANTS

PLEASANT HOUSE, 29 MOUNT PLEASANT, LONDON WC1X 0AP Telephone: 01-837 7252
Telex: 965869 WAKIL G

30th March 1988

Aga Khan Awards Office
32 Chemindes Crets-de-Pregny
1218 Grand Saconnex
GENEVA, SWITZERLAND

Dear Sirs,

REPORT ON THE NOMINATION OF THE MOSQUES OF SAUDI ARABIA

This report is intended as a brief explanation on the purpose of the nominating of the series of mosques presented for the Aga Khan Award as a unified integrated project rather than a statement of individual unrelated projects.

1. The Mosques project, upon a demand from King Fahd, was initiated by the Ministry of Hajj and Awkaf as the source of a national programme for the development of a contemporary traditional mosque architecture in Saudi Arabia. The task of organising the programme was undertaken by Deputy Minister Hossam Khashoggi.
2. In collaboration with the Municipality of Jeddah and through the dynamic personality of its Mayor - Architect Mohamed Said Farsi - a selection of imposing sites were consecrated for the development of the very first experiments in introducing the models of traditional mosque architecture. Apart from serving for worship, these models were intended to demonstrate within a limited budget the means of traditional construction and the various modes of architectural expression within the design of small mosques [the Zawia].
3. The very first mosque was the design of the Island Mosque funded by the Ministry of Hajj and Awkaf. The design was conceived within the confines of traditional sacred space cosmology - the squaring of the circle. Where the 'heavenly' dome above the mihrab is supported by a transitional octagonal drum to the cubed volume of the prayer hall. This tripartite symbolism has been carried into the design of the minaret. The design was expressed in pure crystalline geometry without any attempt of personal or regional stylisation. In that sense it could be said that this mosque contains a universal aspect which extends beyond the confinements of specific and individualistic form. The Island Mosque contains a 'pictographic' essence in its shape and can be considered as having a 'heiroglyphic' aspect of mosque architecture i.e. the characteristics of classic form.

4. The Corniche and Ruwais Mosques are conceived with a more personal and individual expression and differ mainly in that aspect to the design of the Island Mosque. Although still maintaining the traditional aspect of space cosmology, they express a vivid contemporaneity to the vernacular architecture of North Africa and the Mediterranean basin. The strong expression of the catenary vaults in both mosques have subdued the stylised effect of pointed arches and emphasise a typical modern expression. [The catenary and parabolic arch has been widely introduced in modern architecture through the advent of twentieth century engineering science and the predominance of shell structures. It served well as a symbolic expression of functional form.]

We might as well mention here the extensive use of the catenary vaults in the vernacular architecture of Upper Egypt which has filtered through from Pharaonic times. In a sense the Corniche and Ruwais Mosques express a contemporary vernacular free-style of rural architecture.

5. The fourth small mosque, the Binladen Mosque, was again conceived as a classic expression of traditional architecture with the urban context in mind. However, this mosque differs from the Island Mosque in that it reflects a strong stylisation of form. Here, the dome is all encompassing and dominates the overall space together with its hemispherical baldachins, which carry on a hexagonal base. The particular style has been introduced by Sinan the Great and marks the termination of the continuous cycle of Islamic architecture in its various styles of assimilation, adaptation and integration within the tradition. This mosque could be considered as classic in style but mostly of an eclectic nature.
6. The four experiments mentioned above were intended mainly as a demonstration and an education process for students of architecture to show the means of construction and the various expression in handling of space for small mosques. Mimar magazine has also collaborated with the Ministry of Hajj and the Municipality of Jeddah in encouraging students to produce their own designs through an open competition announced in a Mimar publication.
7. It is interesting to mention here that the Island Mosque has been a decisive influence on the Ministry of Hajj Engineering Department and on Binladen Organisation, the main contractors of Saudi Arabia. The Island Mosque has brought about an appreciation and acceptance of this approach to architecture with the full confidence of adapting it to the three grand reconstructions of the historical mosques of Quba and Qiblatain in Medina al Munawwarah and King Saud Mosque in Jeddah.

8. The site of the Quba Mosque in Medina is where the Prophet Mohammed erected the first Mosque of Islam following his Hijrah from Makkah and, therefore, is considered third in importance to the sites of the Haramain in Makkah and Medina and is mandatory to all pilgrims. The need of the increased number of pilgrims to use this Mosque has compelled the demolition of the 150 year old building and the requirement for a new building with five-fold capacity was commissioned and sponsored by King Fahd.

As a result of the unfortunate eradication of the old building it was imperative that the new building be in total compliance with the spirit of the old architecture. Thus, a development of the pre-existing architecture was central to the main theme of design, and a strict adherence to the traditional local style of the Medina mosques was reflected in many aspects of the building.

During the Friday prayers and pilgrimage season, the central courtyard assimilates the increased number of worshippers. A temporary canopy to protect the congregation from direct sunlight was sought for in the design. The solution was made possible by the use of an electrically-operated, retractable tent that adapted the most up-dated technology of lightweight structures, developed in Germany by Professor Frei Otto. This integration of a hi-tech system to a traditionally designed building proved useful and appropriate in addition to demonstrating the approach to problem-solving and decision-making in architecture without the biased dictums of 'modernism' and 'traditionism'.

The Quba Mosque provides an interesting example of revitalisation and reconstitution of architecture in vital historical areas of perpetual usage.

9. The site of Qiblatain Mosque is of another historical importance and relates to the time that the Archangel Gabriel revealed unto the Prophet Mohammed God's request for all Muslims to divert their prayer direction from the Jerasulem Qibla to that of Mekkah. It is said that on receiving this announcement, the worshippers praying at Qiblatain site, re-directed themselves from a northerly direction, facing Jerasulem, to a southerly direction, facing towards Makkah.

In order to purport this action in the architecture, the symbolic gesture of designing two domes; the north one - being a blind dome - superimposes the old Qibla and the south one - being an elevated dome on an open drum - superimposes the Chosen Qibla of Makkah. The two domes are linked by a small cross vault symbolising the transition from one Qibla to the other and the 'heavenly' light coming from the open drum of the latter one emphasises its predominance. A further indication to the Jerusalem Qibla was the placement of a raised flat Mihrab below the blind dome depicting the design of the oldest Mihrab found in Islam in the sub-terranean chamber of the Dome of the Rock in Jerusalem. This treatment in design has reflected the peculiar and characteristic aspect of the Qiblatain Mosque.

Since the existing structure consisted of an awkward and dilapidated building, erected some twenty-five years ago, the design theme had to be re-interpreted by inspiration. The characteristic architectural features were thus inspired by the vernacular architecture of the Southern Arabian Peninsula prior to the northern influence of the Ottoman period. It is within that aspect that the Qiblatain Mosque could be referred to as an authentic vernacular to the region [we preclude here the primitive desert settlements of Najd and similar Nomadic architecture].

10. The King Saud Mosque in Jeddah was erected some thirty years ago in the new district of the Medina Road in Jeddah. The structure was poorly built and badly designed insinuating a concocted style of Mamaluk and Moorish architecture smeared upon third rate commercial design and planning criteria of the modern inheritance of architectural faculties in Egypt. The building was condemned for seven years before it was pulled down and the demand for a new King Saud Mosque to replace it was commissioned by King Fahd.

The King Saud Mosque has meant a lot to Jeddah as it was the first 'monumental' edifice the city has identified with in its quantum leap to the Twentieth Century and the burgeoning economic growth that followed. To the Saudis, the King Saud Mosque architecture reflected a mixture of romantic 'ideal forms' of the Grand Era of Cairo and the exuberant style of the Moors.

The new design was thus conceived to provide this monumental aspect and a huge brick dome of 20 meters span, soaring to a 40 meter height from ground level, was constructed on the air without centering; similarly a 65 meter minaret, in brick masonry, towered aside the main road. This daring feat in construction has been accomplished within a period of 18 months and has managed to prove and extend the feasibility of traditional brick construction within the capacity of modern production and construction means.

The design elements of the mosque had recourse to the most elaborate and elegant designs that has been produced in periods where Islamic architecture has been at its peak. The minaret and portal of King Saud Mosque has depicted the most ingenious designs of stalactites previously existing in the Sultan Hassan Mosque in Cairo. The research and study involved in re-designing, producing and constructing the stalactites has re-instated an art lost to the majority of practising architects in the Muslim world today. The muqarnas [stalactites] is a unique invention of Muslim architecture and encompasses the most disciplined exercise in three dimensional manipulation of volumetric space.

Similarly, an intensive vocabulary of traditional design elements were applied to domes, pendentives, squinches and fan vaulting showing the variety and flexibility by which traditional forms could be used to manipulate and enhance the overall quality of internal space. Everything was specifically designed for the mosque from ornamental door handles, bolts and hinges to floor patterns and carpet design, chandeliers with their lighting fixtures and chains, ornamental plaster-work, wooden awnings and balustrades, brass grills and fountain taps, crescents for the dome and minaret finials and mimbar and mihrab.

The King Saud Mosque could be said to demonstrate a contemporary expression and revitalisation of the vast knowledge that the Muslim heritage has bestowed upon us. A true understanding of the knowledge and art of the past and of its true re-interpretation is vital for perpetuating such universal knowledge and applying it to serve the demands of today; furthermore, adapting it to cope with the imperatives of the new.

The King Saud Mosque design has sought to revitalise and perpetuate the grandeur of a tradition by rightful imitation and creative interpretation expressed by skillful craftsmanship and construction techniques. It is with mentioning here that this attitude towards design is common to the development of a living tradition and sets it apart from the ill-concieved approach of counterfeited revivalism that has swept the Western world, based on a fraudulent conversion of the architectural forms of a pagan Hellenic culture into the Christian milieu of European culture and, more recently, to the meretricious jugglery of post modernism.

11. In between the huge scale of the three grand mosques referred to above and the four small, water-side mosques in Jeddah referred to previously, four examples of community-type mosques have been designed and been built in Jeddah. The Sulaiman Mosque, the Harithy Mosque, the Juffali Mosque and the Azizeyah Mosque in Jeddah have been respectfully commissioned by well established individuals under the auspices of the Ministry of Hajj and the co-operation of the Municipality of Jeddah. Each design has sought to provide various expressions and interpretations to Islamic architecture.

The Juffali Mosque, which is located at the entrance to the old town, reflects the typical architecture of the three vernacular old Jeddah-type mosques of Al Hanafi, Al Mimar and Al Shafie.

The Azizeyah Mosque was conceived within a very limited budget and demonstrates the capacity of achieving an agreeable edifice within financial limitations.

The Harithy Mosque is the smallest of the community mosques but nevertheless the most elaborate. The minaret and mihrab stalactites have been carved out of marble; and its ceramic tiles have been designed and specially manufactured in the old town of Kutaya in Turkey. The general architecture represents a contemporary variation on a traditional theme of design.

The Sulaiman Mosque was the very first mosque to be designed and built in Jeddah and, together with the Island Mosque, has helped in contributing to the introduction of load-bearing brick construction. The resumption of a dominant central dome to the Sulaiman Mosque entailed a precursive endeavour owing to the official antipathy, prevailing at that time, for its application. The Sulaiman Mosque, although somewhat externally austere, has re-introduced the internal courtyard, the women's prayer mezzanine, the vertical bellowing of internal space into a juxtaposition of arches and domes, and the consistency of materials and surface treatment, with an elementary white colour.

As a forerunner, the Sulaiman Mosque has had to endure in all aspects the discomforts of teething pains. However, it has managed to introduce a traditional type of mosque without historical affectations and mannerisms.

CONCLUSION

Having attempted to give a brief history and explanation into the process of the design and construction of the above-mentioned mosques in Saudi Arabia I strongly recommend that they be considered in their totality expressing three different categories of:-

- | | |
|------------------------|---|
| SMALL MOSQUES | - Island, Corniche, Ruwais and Binladen |
| COMMUNITY MOSQUES | - Sulaiman, Harithy, Azizayah and Juffali |
| CONGREGATIONAL MOSQUES | - Quba, Qiblatain and King Saud |

Together they share in common the dedication of a Government Authority [represented in the person of H.E. Deputy Minister Sheik Hosam Khashoggi of Hajj and Awkaf]; to control and impose the supra-functional aspect of the Mosque as the spearhead of a spiritually oriented nation by following up and collaborating with Municipalities, contractors and individual sponsors to achieve a material manifestation reflected through the architecture of the Mosque.

Such an endeavour has encompassed occasional difficulties and frustrations especially with the sudden economic set-backs that have assailed recently. It was also unfortunate that Mayor Mohamed Said Farsi has, due to health conditions, resigned from his post and, consequently, has affected the site developments of the water-side mosques in Jeddah. The confined budgets of the Ministry have bestowed the personal financing of King Fahd for the Quba, Qiblatain and King Saud Mosques.

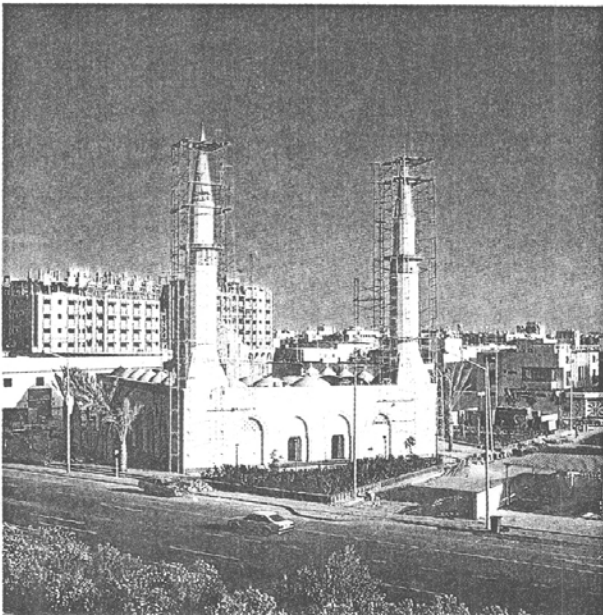
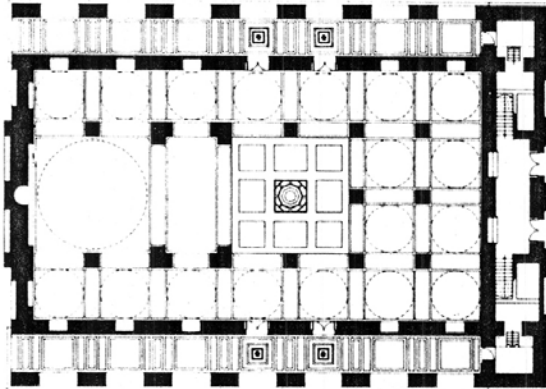
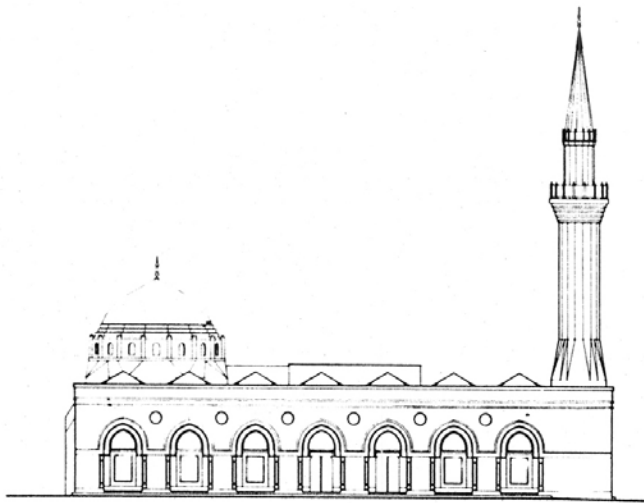
In each project ideas and various elements were applied in order to introduce a variety of architectural expression and construction techniques, achieving a comprehensive vocabulary within the scope of traditional architecture.

Further to that, a training workshop to accompany each mosque has provided experience and know-how to all levels of professionals, technicians and craftsmen. Over two hundred masons ranging from Turkey, Pakistan, Syria, India and Egypt have emerged from the on-site training provided to them; over eighty gypsum plasterers were introduced from Morocco to practise their craft and integrate new geometric designs to their well preserved knowledge of Moroccan patterns. Carpenters have also trained and evolved from the extensive use of wooden elements in the architectural design and also in the making of molds and formworks for intricate structural shapes.

Respectively, the marbleworks involved has also provided ample opportunity for their craftsmen. Brass chandeliers, grills and ironmongery has equally benefitted and renewed a currently neglected trade. And last, but not least, was the opportunity offered to engineers, architects and builders to experience the techniques and methods of traditional Islamic crafts.

It is this unified and integrated vision which has been dispersed by its sheer magnitude into several projects and stages that requires their recollection into one comprehensive presentation in order to accomplish the overall development concept into a unified totality.

Abdel Wahed El Wakil



Al-Harithy Mosque

Site

The mosque is situated off the Medina Road and Sari Street. The plot deviates at an angle of thirty degrees from Makkah and the street alignment is corrected by means of landscaping. An annex building on the back street provides for the amenities of the mosque.

Design

The Harithy mosque has a capacity for one thousand worshippers and is designed with a small courtyard within the centre of the prayer hall. In comparison to the Sualaiman mosque where the courtyard was conceived as an extension of the prayer hall. The Harithy courtyard is also further enhanced by a fountain and plants. This dates back to the traditional mosques which often had palm trees in their courtyards. Shade is provided by a wooden canopy and a retractable tent serves to cover the whole courtyard when necessary. Apart from the courtyard the most interesting aspect of design is the main dome with its pendentives of interlacing courses of bricks. These produce an interweaving pattern of shade and light. The proportions within the interior of the mosque are of a subtle beauty. While the flow of space is well-controlled and lucid. A characteristic of the mosque is the way the side elevations are enhanced by a series of adjoining arcades topped by successive small domes. The domes provide an intriguing solution by being supported on a rectangular base and reconciled by means of pendentives. The directional space required for the gallery was also resolved by the raising of the lateral internal arches above the level of the arches on the facade. The women's gallery is approached from the rear facade and leads to a double-bayed mezzanine by means of two staircases. The mosque has two slender minarets with intricate balconies of marble stalactites.

Construction

The mosque is mainly of load-bearing brickwork with a concrete slab for the mezzanine. The finishes of the interior are of tiled ceramic and carved marble for the mihrab. These were made by specialists in Turkey.

Client: Al Sharief Muwaffak M Al Harithy

Architect/Design: Abdel Wahed El Wakil

Supervision: Concenter

Contractor: Al Harithy Contracting Division

Completed: 1407 H/1986

• Arabic text pages 56 – 61

Alebanaa April - May 1987

Al-Sulaiman Mosque

Site

Bordering the corniche, in the Hamra District of Jeddah, the site is a huge plot of 10,000 sq. metres allocated by the Municipality of Jeddah. It is bordered by two main avenues and is provided with extensive parking space. The mosque is built on a raised platform of consolidated soil which was required to design the foundations without piles.

Design

The Sulaiman Mosque was the first experiment in re-integrating traditional design and materials with contemporary mosque architecture. The plan of the mosque follows the traditional form of a rectangle with a courtyard. The main entrances to the mosque lead into the courtyard and to the prayer hall. One entrance reserved for women has a staircase leading to a gallery surrounding the courtyard which gives access to the women's prayer mezzanine.

The main prayer hall has a raised dome of twelve metres in diameter – considered to be the very first to be built in recent times by the traditional masonry technique of free corbelling without the means of formwork. The experiment was recorded on video camera by King Abdul Aziz University's Information and Media center. Three smaller domes [six metres in diameter] on each side of the main dome together with the rear space containing the women's mezzanine accomplish the overall space of the main prayer hall.

The use of traditional ornamental details was also intentionally applied to the design. The intricate art of 'muqarnas' stalactite design was re-discovered for the purpose of detailing the minaret balconies. Each balcony had a different design according to the proportion of the width of each side and their respective protrusions.

The marble patterns have also been designed in traditional geometric forms that relate to scale and hierarchy.

The total area of the mosque is about 1,500 square metres and can accommodate over one thousand worshippers.

Construction

The construction was intended to be totally in load-bearing brick, however the inexperience of the contractors and engineers in masonry construction obliged the use of re-inforced concrete columns and tie-beams. All flat roofs were also designed in solid concrete slabs.

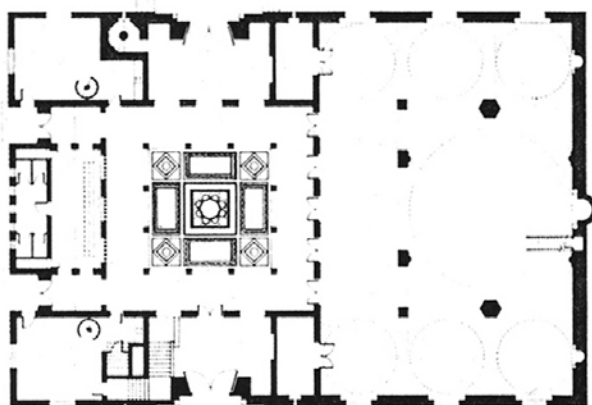
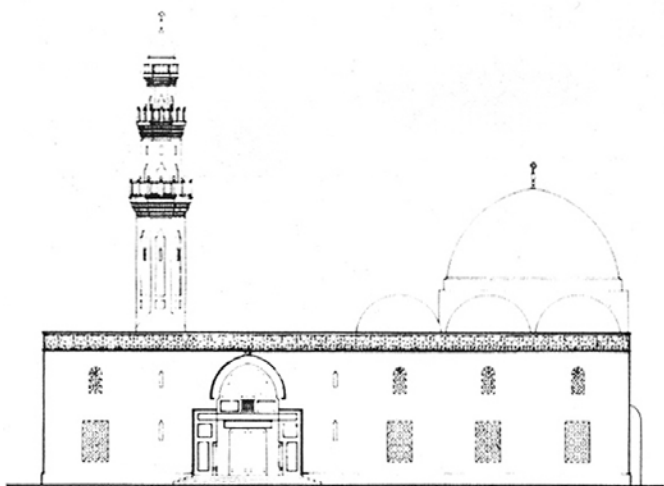
Client: Abdel Aziz Al-Sulaiman and Brothers

Architect/Design: Abdel Wahed El Wakil

Contractor: Rolaco

Completed: 1401 H/1980

• Arabic text pages 48 – 53



Juffali Mosque

Site

The mosque is situated in the garden surrounding the Jeddah lagoon by the old city. Opposite the mosque is the famous building of the Ministry of Foreign Affairs.

Design

It was essential that the design of this mosque be related to the old vernacular architecture in the old quarters of the town. The main influence for the design of this mosque came from the examples of the Mimar, the Shafi, and the Hanifi mosques.

This type of architecture has an elegance and elementary simplicity which was characteristic of the area. The initial design was commissioned by the Ministry of Hajj and Awqaf and was adopted for Juffali, who sponsored its construction. The mosque is designed to accommodate two thousand people.

Construction

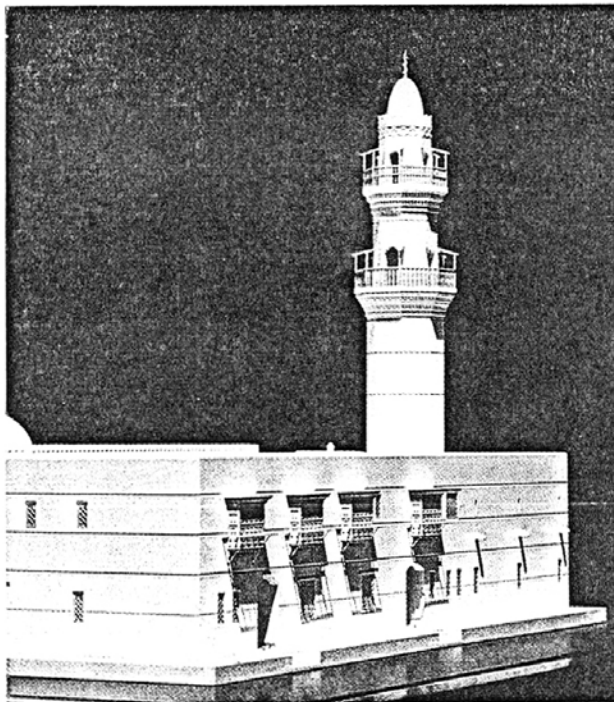
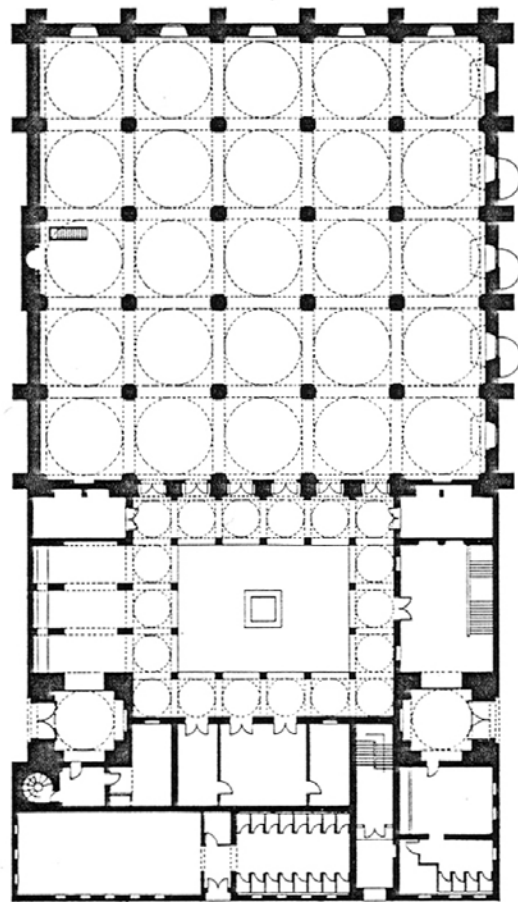
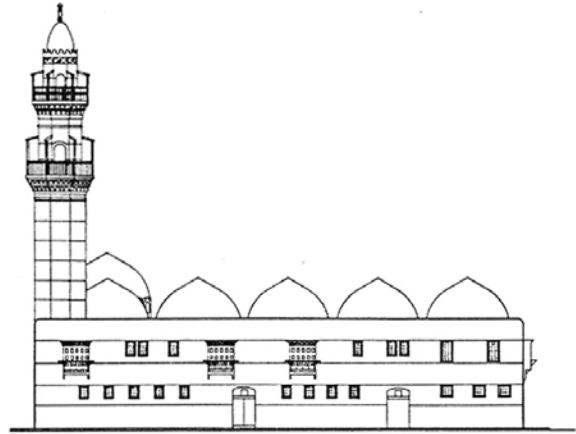
The mosque will be built of load-bearing red terracotta brick.

Client: A. E. Juffali Bros.

Architect/Design: Abdel Wahed El Wakil

Contractor: International Centre

Completion: 1986



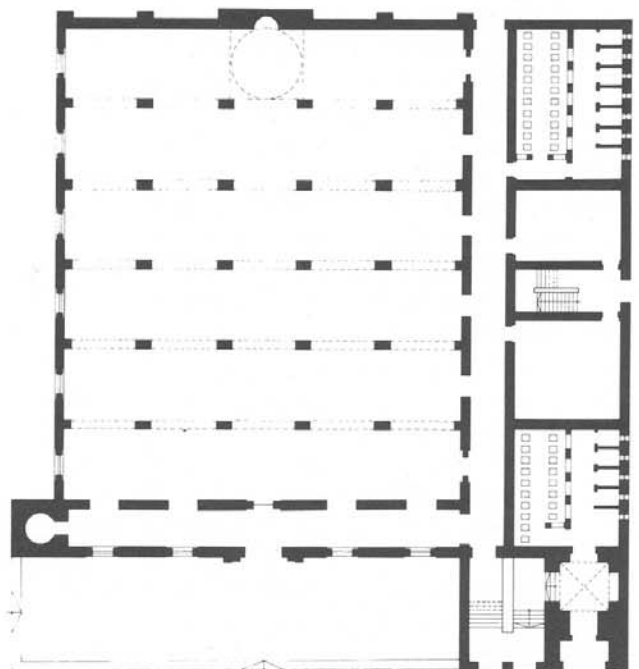
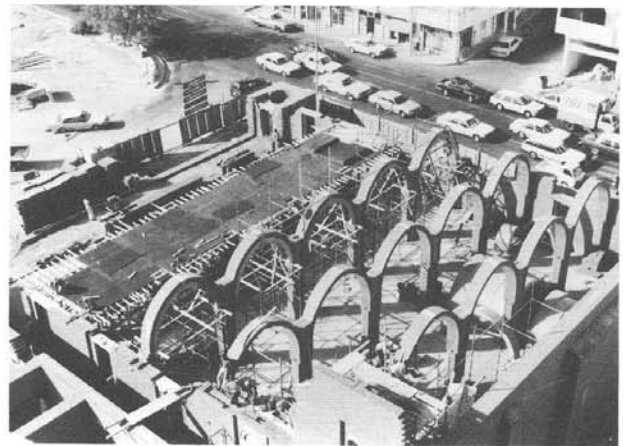
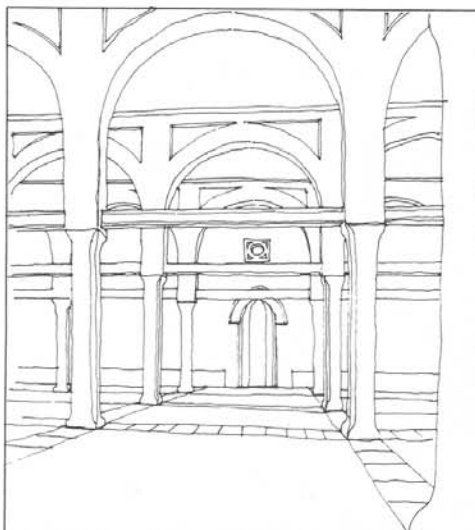
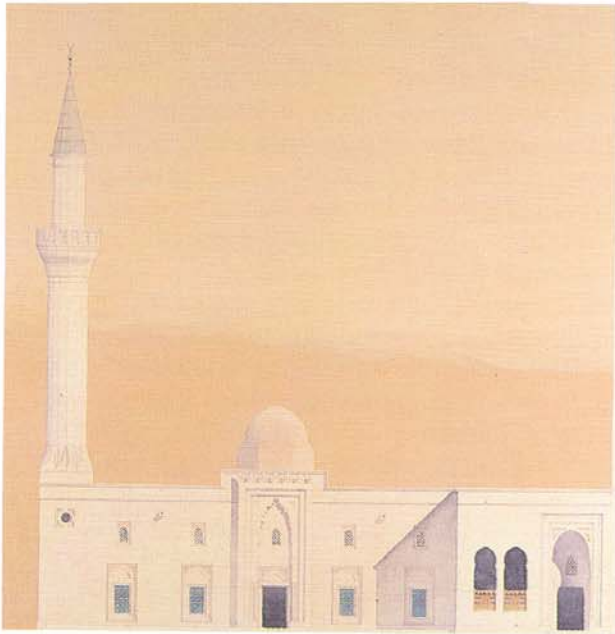
Latest construction news

El-Wakil's most recent mosque is being erected in the Boghdadiyah district of Jeddah to accommodate 1,000 worshippers, including a mezzanine for 250.

The mosque is provided with ablutions, storage and two apartments for the imam and muezzin.

The construction is of red brick terracotta finished in plaster. The prayer hall consists of a series of six arcades spanned by transverse vaults.

The sponsors are Rafat and Silsilla in collaboration with the municipality of Jeddah. It is being built by Harithy Construction Division and supervised by Concenter Engineering Office.



who were responsible for the work. The building was constructed by CMC bricks without using concrete except in certain limited places. The whole mosque is structured on double bearing walls in the middle of which heat insulation, electrical, sanitary and airconditioning extensions were located. The building has numerous openings for windows and arches hence a lot of effort had to be exerted to make these openings without effecting the general shape of the mosque from outside, so that these openings would be self integrated with the shape of the bricks and the filling gaps.

The contractor has thus carried out a detailed survey of all existing types of bricks and classified them into bricks of standard and non-standard shape. On counting bricks of non-standard shape there are about 87 bricks mainly used around window openings, arches and so on. Special iron moulds were made for these non-standard shapes to withstand the high pressure required during the process of casting the bricks. This has raised the cost of these special bricks as the number required from each type did not exceed more than two pieces in some cases.

The study was not limited to the diverse shapes of bricks but dealt also with its diverse colours. The mosque is basically built with bricks of light sandy colour but it has other colours such as the yellow, the green, the brown, the white and the orange. This required coordination and joint effort between the contractor (Dilmon) and the CMC factory.

The construction method is based on double bearing walls of approximately 60-70cm in thickness due to two reasons: the first is heat insulation since it provides for inserting heat insulation 10cm thick in the empty space between the two walls. The second is that it provides for all electrical, sanitary and airconditioning installations without affecting the appearance of the mosque from inside. The construction process has been going on simultaneously with the extension of services for the mosque as a whole, specially the electrical and airconditioning piping which took most of the space between the bearing walls. This method of construction is distinct from other methods commonly used in this part of the world.

The mosque has a huge iron ceiling, 30m in length and 25m in width carried over the double bearing walls. In the centre, there is a concrete dome 8.24m in diameter as well as three other smaller ones 2.40m in diameter. Also there is a huge tunnel under the mosque, 4 meters in width by 3 meters in height and 30 meters in length for the airconditioning connections which branch into smaller tunnels under the floor of the mosque from the tunnel to the

double wall through which the airconditioning ducts rise to the false ceiling, lighting provisions and dome finishing from inside were all made of gypsum cast on site by skilled labour from Dilmon.

One of the most interesting features of the mosque is its wood work with wonderful designs ranging from hard teak doors to fine lattice works of hard teak in the women's section. Another feature which catches the eye is writing by means of small ceramic tiles 2×2 cm in size on the main dome, secondary domes and the columns inside the mosque.

Electrical lighting is designed to be indirect to help the worshippers concentrate on their prayer. The design also provided for dome lighting and the effect of natural light coming through coloured glass windows.

The whole construction process has been closely supervised by the consultant. The engineers of Dilmon company were always prompt in submitting all the necessary information and studies to ensure the timely execution of the construction programme. All work went regularly and the project was finally completed in 18 months.

Built up area is 175m², site area: 600m², Capacity: 2000 worshippers
Al-Munira mosque consists of the following components:

- The Mosque (750m²)
- Courtyard (Sahn) (330m²)
- Mezzanine floor for women (300m²)
- Men ablution and bathrooms (60m²)
- Women ablutions and bathrooms (40m²)
- Minaret (8m²) height 37m
- Residence of Imam and the muazzin (280m²)
- Front yard
- Garden
- Car parking
- Airconditioning plant room in the basement

Al-Munira Mosque, Dammam

Contractor: Dilmon Company Limited

(Owners Abdulaziz and Abdulwahab Al-Ghunaim and Brothers)

Prepared by: Eng. Ziyad M. Dabous, Construction Manager

• Arabic text pages 9 – 11