1992 Technical Review Summary
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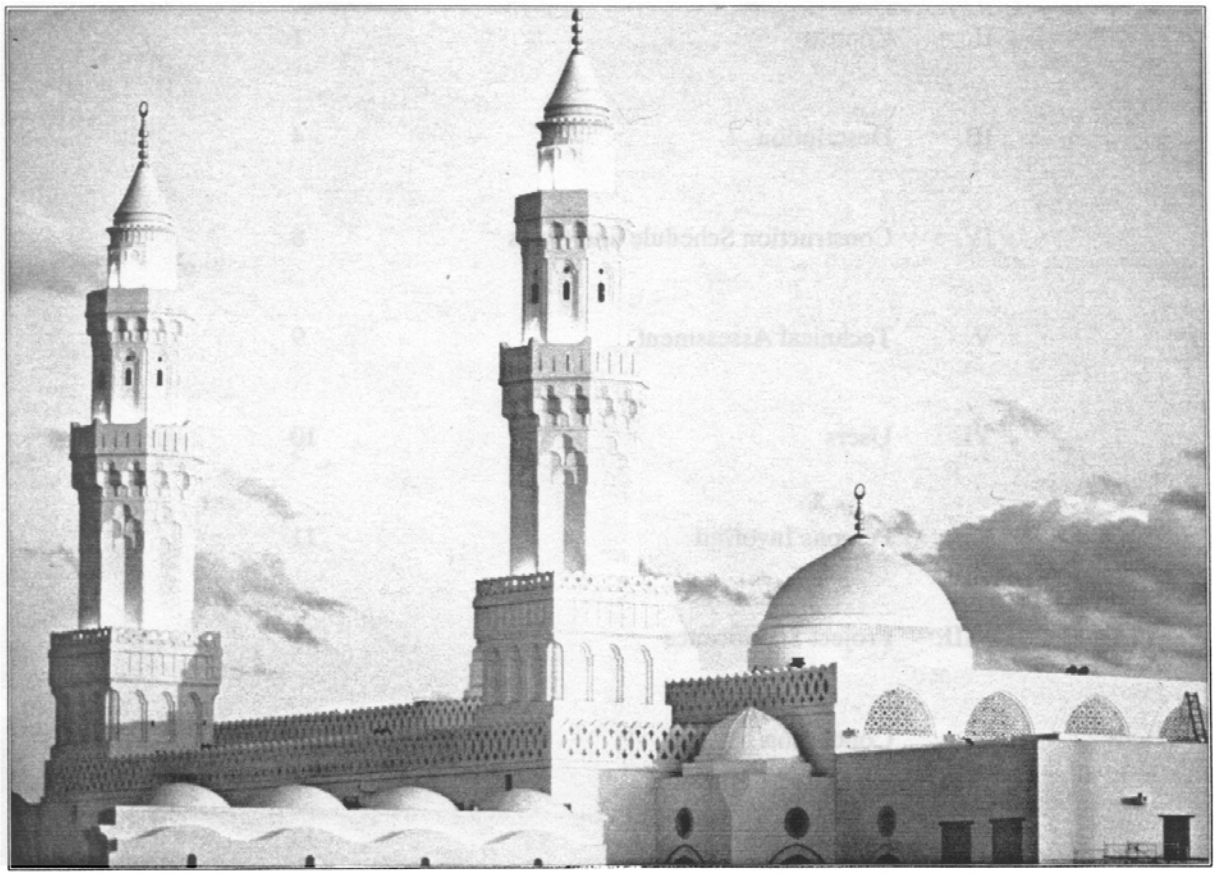
Qiblatain Mosque

Medina, Saudi Arabia



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London, United Kingdom

Client
Ministry of Hajj and Awkaf
Jeddah, Saudi Arabia

Completed
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Qiblatain Mosque, Medina, Saudi Arabia

I. Introduction

The holy city of Medina is visited by millions of pilgrims from all over the world as a part of the *Hajj* ritual and to pay homage to Prophet Mohammed, whose tomb is located there. A number of historically important mosque sites are located in the city where the Prophet led prayers and offered sermons to the believers. Over the centuries, the mosques on these sites underwent modification, enlargement and rebuilding to suit the changing needs of the times and to preserve their spiritual significance. Qiblatain Mosque is one such mosque; it was rebuilt in 1988 as part of an extensive programme of new mosque construction undertaken in the 1980's by the Ministry of Hajj and Awkaf, Kingdom of Saudi Arabia.

The ministry placed special emphasis on the context of mosque design with respect to the history, culture and tradition of the land. The design objective was to re-interpret the heritage of Islamic architecture and to create a spiritual environment for pilgrims visiting the holy sites.

The name *Qiblatain* derives from a significant historical event in Islam, when Prophet Mohammed was ordained to change the direction of prayer from Jerusalem in the north to Mecca in the south. It was in this mosque that the faithful first turned from one direction to the other during prayer, and the mosque has since then been known as *Qiblatain Mosque* which, in Arabic, means "mosque of two *qiblas*".

The mosque is located on the north-west of Medina on Khaled Ibn Al Waleed Street. The site covers 3'920 m^2 and is configured as a triangle truncated on its eastern apex. The earlier mosque (built around 1953) which occupied the site was demolished to make way for the new building.

The new mosque accommodates 2'000 worshippers on two levels. The main prayer hall is elevated one floor above the ground, and the ladies' prayer hall is on the gallery which forms part of the main prayer hall. Service, toilet, and ablution facilities are located on the ground floor. The mosque can be approached from all sides other than the west, where a graveyard is located. The spaces around the main prayer hall provide for circulation, a *saha*, a court, living accommodations, and landscaping.

The symmetrical mosque design follows traditional, orthogonal geometry in its main structure. Two domes are located on the *qibla* axis and recall the history of the original mosque. These domes are flanked by two lofty minarets with delicate details rising to a height of 40.8 m. The relatively flat landscape features a small hill in the background and is surrounded by low-rise developments; the mosque thus appears as a dominating landmark. The architecture of the mosque is characterised by a sublime quality attained through the subtle articulation of forms and details, and the white-painted exterior surfaces suggest spiritual tranquillity and repose.

II. Context

a. *Historical Background*

The Earliest Mosque

The very first mosque in the Islamic faith was erected at the site of Quba near Medina by Banu Salim. Prophet Mohammed built his own mosque on the day of his arrival to Medina, the day which marks the beginning of the Muslim Calendar (622 A.D.). It is assumed that the original Qiblatain Mosque was also built around that time by local tribes living in the area. Presumably, its walls were built with stone and sun-dried bricks and it was roofed with dried palm leaves. There is no documentation available on the earliest mosque design, but it is recorded that people prayed in this mosque towards Bayt al-mukaddas in Jerusalem for the first seventeen months, and then the direction of the *qibla* was changed to Mecca. *(1)*

(1) The History of Landmarks of Medina: Past and Present, in Arabic by S.A.Y. al-Khairi, 1410 (H).

Documentation further mentions the name of Al Sujai Ali Shaheen Al Jamali, head of the servants of the Prophet's mosque, who commissioned the mosque to be remodelled and its ceiling renewed in 893 (H). It was further reconstructed and restored in 950 (H) by Sultan Süleyman. The Saudi Government later rebuilt the mosque, added an outside finish and also built a school for Bedouins in the area. The mosque was known as Qiblatain Bani Salama Mosque.

Some photographic documentation has been found in an Arabic publication "*Mirror of the Two Holy Mosques*" *(2)*. One of the photographs shows that the mosque was a rectangular structure surrounded by an enclosure wall. The mosque was placed at the extreme end of the *qibla* direction, and the *qibla* wall was extended in both directions as a boundary wall. Other photographs show the *mihrab* and the mosque structure in ruins.

The 1953 Mosque

Two relatively recent photographs have been found showing two stages of the 1953 mosque which was demolished. The structure was built three metres above ground. From what senior citizens recall, the graveyard was along the west side and a garden lay on the north, adjacent to a private farm. A primary school was constructed on the east side, as can be seen in the photographs. Domestic houses on the south were later demolished to make room for parking. There were two gates to the mosque: one on the north and the other on the west. The mosque was approached by an asphalt road which came round the north to the west entry.

The mosque had a rectangular structure with a flat roof of concrete, and a squat minaret was placed at the north-eastern corner of the mosque enclosure. The minaret had a rectangular base and gradually changed shape via receding tiers to end in a conical dome topped with a massive spire. (Designed in the vernacular tradition and with crude finishing, similar minarets can still be seen in many community mosques built by the people themselves.) A grand flight of stairs led to the mosque court; shading of the forecourt with translucent pyramidal forms placed on a square grid was a later addition.

From the descriptions of those who remember it, the previous mosque was inconspicuous in form and scale and blended well with the surrounding architecture and other community mosques.

b. *Local Architectural Character*

Vernacular mosque architecture is very simple in form and humble in scale. Characteristically, vernacular mosques are similar to surrounding dwelling houses, from which they are differentiated by a minaret. The height of minarets was controlled so that the privacy of the surrounding courtyard houses would not be disturbed while the *Muezzin* went up to call for prayer or *Azan*. Squat minarets were therefore a typical feature of community mosques, although variants of this typology can also be found in some congregational mosques. Mosque interiors are usually designed with columns and arches supporting a flat roof. Domes rarely appear as design features. A marked simplicity and overall uniformity in mosque design was characteristic in Saudi Arabia up until the advent of the building boom that accompanied the flourishing oil economy of the 1970's.

A sudden architectural transformation took place in Saudi Arabia in the seventies. Traditional building materials such as stone, brick and wood were replaced by concrete, glass and aluminium. It was a period characterised by exotic designs based on imported models from the West, quite incongruous with the socio-cultural and climatic milieu. The euphoria of quick modernisation stimulated the use of alien architectural forms and designs, and resulted in the emergence of a variety of mosque designs whose peculiar shapes and proportions were unprecedented in the Saudi Arabian context. Circles, octagons, and hexagons replaced the traditional rectangular forms of the main prayer hall; large, column-free spans were common, and *qibla* walls, traditionally opaque, were sometimes made transparent. Domes, mostly made of concrete, appeared as a new design element. Minarets took on every shape, size, and volume.

(2) Mirror of Al-Haramain written by Ibrahim Refat Pasha, published by Egyptian Dar Al Qutab Press, first published in 1344H. It is referred to as the mosque of two *qiblas* and there are three photographs in between pages 414 and 415.

The concept of passive climate control – which traditionally featured thick walls, deep-set window openings, and the use of *mashrabiyya* – was gradually forgotten in preference of easily available mechanical systems. Indeed, it is now rare to see *mashrabiyya* in the city of Medina. Apartment dwelling, a relatively new introduction made possible by the introduction of industrialised building components, claims large areas of the urban fabric; ironically, however, many of these large complexes remained unoccupied for long periods, as construction far exceeded demand. Meanwhile, older quarters are continually demolished for the sake of urban renewal. Medina, like other cities of Saudi Arabia, is undergoing a phase of architectural transformation and experimentation. There is a growing awareness and appreciation to preserve the remaining heritage and to stop further unwarranted architectural developments.

c. *Climatic Condition*

The climate of Medina is extremely hot and dry. The city is surrounded by desert and mountains. It stands 750 m above sea level and lies on 24°50' north latitude. Prevailing winds are from the north and north-west in summer and from the opposite direction in winter. Humidity is very low. Annual average rainfall is 3.94 cm. The greatest amount of rainfall occurs in April, with up to 1.22 cm. The coldest month is January, when the average temperature is 17.2°C. Diurnal variation is 11.6° C at night-time to 23.5° C at day-time in winter. The hottest month is August, with an average temperature of 35.7° C. Diurnal variation is then 20.3°C at night-time to 42.1°C at day-time.

d. *Immediate Surroundings of the Site*

The previous Qiblatain Mosque was surrounded by two - or three - storey buildings and a graveyard on the west; only the graveyard remains today. Initially, an irregular site (measuring 83 x 95 x 82 m) was allotted for the elaborate programme of the mosque complex. Subsequently, in order to provide ample visual distance from the surroundings, a large rectangular block defined by a peripheral road was developed on the north-eastern corner. The graveyard thus is now located more-or-less in the centre of the site, and the parking area occupies a large triangular tract on the south. The programme required part of the surrounding residential area; beyond the peripheral road, the residential neighbourhood continues and is characterised by an indigenous pattern which spreads from south-west to south-east. The neighbourhood is densely built with medium-rise buildings and characterised by multitudinous pseudo-modern façade treatments to suit individual tastes.

Approaching along Khaled Ibn Al Waleed Street, the mosque can be seen as a landmark from a long distance. To protect this vista, a gas station under construction in the adjacent block on the north-west will be demolished upon an order by the municipality. The municipality has also made planning regulations to control development around the mosque and will impose restrictions for building heights not to exceed two storeys. Revitalisation of the surrounding area is also being actively considered. The mosque site is relatively barren, at the moment, due to lack of vegetation. However, a landscaping plan is being prepared and foresees the development of shaded areas with palm trees, and gardens in the surrounding areas.

The consultant of the mosque suggested an extensive development plan, comprising commercial and residential facilities, for the area on the western side of the mosque. However, the proposal has not progressed beyond schematic design.

e. *Topography of the Project Site*

The site is almost flat, gently sloping down towards the west. Photographs show that the previous mosque was raised on an elevated platform of land, so it is obvious that the site was levelled to construct the present mosque. Surrounding land is also flat, and only one small hill can be seen within the immediate vicinity, to the east.

III. Description

a. *Conditions That Gave Rise to the Programme Formulation*

In Saudi Arabia, the Ministry of Hajj and Awkaf (Pilgrimage and Endowments) is entrusted with the responsibility of the development, maintenance and management of mosques and religious establishments. With the patronage of His Majesty King Fahd bin Abdul Aziz, the ministry has drawn up new plans and programmes for the overall development of religious architecture in the country. The programme is intended to convey a befitting contemporary image of the holy land of Muslims. The aims and objectives of the programme were incorporated in the Kingdom's Third Five-Year Plan.

In the initial five-year plan, emphasis was placed on infrastructure development and the modernisation of technology to foster development in the shortest possible time. However, the development of modern technology was accompanied by the introduction of elements of alien culture, in the name of progress. In the development spree that followed, the value of traditional culture was overlooked. This de-stabilised society and resulted in a process of the destruction of traditional values and culture.

The overwhelming problem was the sudden rush of oil money in the seventies that saw many ambitious schemes grow overnight. The momentum of development was so great that it overshadowed the factor of time that is normally required to integrate the value and impact of such development. Architecture entered a phase of meaningless extravagance; the tendency was to break away from tradition, to crush anything old and indigenous, and to replace it with something new that had an image of modernity and affluence.

In the initial stage, decision makers trained in western culture were tuned to accept western ideologies, and looked towards Egypt for Islamic inspiration, as Egypt had been known for centuries as a breeding ground of Islamic art and culture. Egypt was again under the grip of colonial power. Cairo University was the first engineering school to teach architecture dominated by Greco-Roman influence. Due to the lack of local expertise in Saudi Arabia, many of the commissions for religious buildings thus went to expatriate architects from neighbouring countries. Their designs were mostly the result of an intuitive approach, representing elemental pastiche coined from diverse sources of Islamic architecture.

The banality of such mosque design, based on the juxtaposition of geometric form devoid of any intellectual content, received official attention and criticism. It is important to note that the personal initiative of the Deputy Minister of Hajj and Awkaf, His Excellency Husam Hussein Khashoggi, and the encouragement of his minister, His Excellency Sheikh Abdul Wahab Ahmed Abdul Wasi, helped persuade the government to embark upon a new conception of mosque design. This conception was to be based on the analysis and verification of the glorious heritage of mosque design in Islamic culture, and re-interpreted in contemporary mosque designs in order to establish a link between the distant past and the present. This was intended to re-establish a sense of order, value and discipline, considered to be inherent qualities of traditional Islamic architecture.

However, this task was not a simple one, and had to go through a painstaking process of elimination in order to select designers, and mosque designs, capable of attaining the defined objectives. As it was not felt that any of the architects located in the municipality of Medina possessed the necessary training and knowledge to undertake such an endeavour, a number of renowned architects were approached. The lack of trained personnel in the ministry was also a constraining factor. On the other hand, the demand for new mosques was multiplying. As an immediate measure, the ministry developed five design types, for mosques of different sizes to suit the needs of different communities. The idea was not to impose designs on the community, but, instead, to facilitate the task by providing guidance.

More critical was the question of reconstructing mosques of historical significance. The ministry was confronted with the problem of how to re-create the past, of how to define contemporary interpretations of traditional mosque architecture, and of how to find capable, intelligent

designers sympathetic to their approach. The potential of the Egyptian architect Abdel Wahed El-Wakil was evident in his design for a small mosque in Jeddah (the Island Mosque), and generated confidence for him to be selected as the designer for a series of mosques in different parts of Jeddah and Medina by the Ministry Hajj and Awkaf. Qiblatain Mosque was commissioned as a part of this programme in early 1986.

b. General Objectives

The primary objective of the programme was to develop a contemporary vocabulary of mosque architecture based on memories of the past that are capable of evoking awareness of the spirit of Islam and of strengthening one's belief and world views in the light of Islam. The mosques were intended to serve as models of Islamic monuments capable of inspiring millions of *Hajj* pilgrims and future generations of the Kingdom.

In Islam, mosques should also serve as socio-islamic centres, beyond their function as a place for prayer. To attain this objective, libraries, class-rooms, and lecture halls, in addition to essential facilities such as the prayer hall, ablutions, parking, and living accommodations for the *Imam* and the *Muezzin*, were comprised in the building programme. Moreover, if the site selected for a mosque happened to be an historical landmark, then that importance was required to be reflected in the design and architectural character of the mosque.

c. Functional Requirements

There are standardised functional requirements for mosques which must be fulfilled to obtain clearance from the Building License Department. Initial distinction was made between *Jami'* and Community Mosques (*Jami'* Mosques are relatively large mosques where the Friday prayer is held). Mosque structures should not occupy more than two thirds of the plot. The mosque must be provided with an ablutions area, and with accommodations for the *Muezzin* and the *Imam*. There should be a ladies' gallery with separate entry and ablution area. Air-conditioning is a requirement for large mosques. For fire protection, American NFPA regulations are followed, which require the entire mosque to be evacuated within three minutes. One parking space is provided for every 30 persons, and 2% of the parking area must be provided for the handicapped. Physical provisions for the handicapped were also required, such as access ramps and toilet facilities. Drinking water fountains, *sabil*, were required to be provided outside the mosque. Within these parameters, the architect was given full freedom to design and shape the mosque.

In the case of Qiblatain Mosque, the architect was given the responsibility for both the programme and the design of the mosque complex. Since finance was not a restraining factor, the only constraint was the site, and the architect had the freedom to manipulate the programme in accordance with his design concept.

d. Building Data

Space allocation for the different functions is as follows:

Main prayer hall	1190 m^2
Women's gallery	400 m^2
Access gallery	148 m^2
Stairwells	204 m^2
Male ablutions and toilet	150 m^2
Female ablutions and toilets	70 m^2
Circulation	1242 m^2
Courtyard	213 m^2
Classrooms	65 m^2
Living accommodations	521 m^2
Mechanical service	1190 m^2

Dimensions of the principal elements are indicated below:

Diameter of large domes	7.8 m
Height of main dome	19.9 m
Height of second dome	18.9 m
Width of vaults	3.8 m
Height of vaults	11.8 m
Width of arches	3.8 and 8.8 m
Height of arches	7.7 and 9.7 m
Height of minarets	40.8 m

e. *Evolution of Design Concept*

The orientation of all mosques is determined by the *qibla* axis which, in Medina, is 4 degrees east of true south. The *qibla* wall stands at right angles to the *qibla* axis which runs along the eastern boundary of the Qiblatain Mosque. The rectangular shape of the main prayer hall that followed from the *qibla* wall stands at a 34° angle with the main road on the north. All the other activities of the mosque centre around the main prayer hall, which measures 49.5 x 24 m. The distribution of functions has been made in such a way that the mosque can be approached from all sides – except the side adjoining the graveyard – through defined entries. Along the boundary adjoining the graveyard, the living accommodations are located and are carefully planned to ensure the privacy of the residences of the *Imam* and the *Muezzin*.

Climatic aspects were a major consideration in siting the building, though most of the important interior spaces are air-conditioned. The building covers almost the entire area of the plot. Open approach courts, triangular in shape, are placed on the east and north so that they are shaded and cooled by the building volume, which covers the entire southern portion of the site.

The main prayer hall is elevated one floor above the ground. Most of the ground floor area is occupied by services: mechanical room, storage, toilets, ablutions for male and female pilgrims, maintenance office, accommodations and circulation space. There is a triangular, landscaped garden court on the north provided with *sabil*, drinking water fountains, which are placed in a row.

The main approach to the mosque is on the south through a wide flight of stairs parallel to the main road that leads to the *saha*, or entrance courtyard. Other entrances are from a stair on the south-west corner, and from a garden court on the eastern edge, which is provided with a ramp for the handicapped. The ground floor can also be approached from these points; for the use of toilet and ablutions. The ladies' entry is from one side, on the ground floor directly off the main road. There is an entrance lounge for ladies from where they may proceed to the ablutions and toilet areas on the same floor, or take either one of the two stairs to the ladies' prayer gallery two floors above. The ladies' gallery forms part of the main prayer hall; it is a balcony that extends two bays from the rear wall. There are three classrooms situated at balcony level which overlook the main prayer hall from the western side. The classrooms are approached by two separate stairs.

A rectangular *loggia* has been designed and is crowned with four domes on the north-western corner of the site, and this creates a sense enclosure of the *saha* (court). The main entrance to the ground floor is also located just underneath the *loggia*.

Planning two domes on the *qibla* axis to commemorate the event of shifting the *qibla* direction is the most significant aspect of formal expression. The two domes are linked by a small cross vault to symbolise the transition. The main dome over the *qibla* has been raised on a drum to allow "heavenly" light to penetrate through its openings, while the other dome is placed directly onto the roof to imply that "heavenly" light has ceased to enter as it is no longer the *qibla*. In order to conserve the history of the Jerusalem *qibla*, a flat replica of the oldest *mihrab* found in Islam in the subterranean chamber of the Dome of the Rock in Jerusalem is placed directly underneath the blind dome.

The two soaring minarets that flank the domes on the *qibla* axis at the two ends of the main entrance are the most prominent and guiding elements of the overall composition of the mosque complex. They are identical in design. Projecting from the corners of the main mass of the building, they gradually recede in telescopic form with different shapes; from a square base, they end in a conical dome topped with a metal finial. They are very well balanced and in proportion with the overall mass of the building. Delicately detailed with Islamic decorative motifs in the form of *muqarnas* (stalactites), *araisse*, *shurafat* (crenellations), balconies, arched recesses, and openings, the minarets attain a graceful, sculptural quality that expresses refined craftsmanship.

There are two small domes at the two ends of the northern façade which indicate corner entrances. The main entrance is emphasised by a double-height, arched opening flanked by two small arches; these give access to the *majaz* (transition corridor) for entry to the main hall. This transition space is conventionally used for the removal of footwear before entering the main prayer hall. Arrangements are made to keep shoes in racks in that area.

The roof of the main prayer hall is covered with a series of vaults running parallel to the *qibla* wall that can be seen only from within the hall. The vaults are hidden on the outside by the crenellations of the parapet wall.

To accentuate the domes and the minarets, the overall form and façades of the mosque are kept very simple. The exterior appears as a continuous wall, wrapped around the volumes, with a variety of apertures. The importance of the openings is expressed by the extent of decoration around them. Decorative screens and railings in traditional designs have been extensively used both inside and outside. The only unique feature in the south façade is the traditional wooden shading device that is clipped to the wall just below the parapet and above the arched entry from the parking lot. This acts as an interlude between the massive wall surface below and the delicately detailed parapet above.

The interior of the prayer hall is designed with extremely restrained and refined decoration. The elements of decoration are geometric motifs carved in gypsum and calligraphic inscriptions from the *Quran*. Flat ceilings, edges and the curved surfaces of the vaults are all finished with gypsum plaster decoration. Similar decoration is applied to the niches along the wall where the *Quran* is kept. Vaults and domes are painted in a reddish-brown brick colour and the rest of the surfaces, other than the gypsum decoration, are painted white. The piers inside the prayer hall have rounded, edge-like corner pilasters with vase capitals ending at the height of the gallery.

The *mihrab* is surrounded by a rectangular frame of *Quranic* calligraphy where *Ayat* 133 of the 2nd *Sura*, *Al'Imran*, is written in gold letters; within that frame, there are two arched recesses supported on decorated round columns. *Ayat* 144 of *Sura Al Baqarah* is written on those two arched surfaces. Next to the *mihrab*, a massive wooden *minbar* is placed, rising seven steps, and topped with a dome. The *minbar* cuts across a number of front lines in the first arcade, the *riwaq*. The floor is covered with specially designed carpet.

The surrounding landscaping is in the process of planning by the municipality. The garden in the front court was planned for the planting of palm trees; however, these were later replaced by flowering bushes which can attain a height of five feet.

f. Structure, Material, Technology

The mosque stands on a reinforced concrete foundation and concrete pillars. There are two concrete floors. The remainder of the structure is entirely built of load-bearing brick walls, piers, arches, vaults and domes. The forecourt is also built with a net-work of cross vaults. Perforated load-bearing bricks of different sizes have been used. Massive brick walls around the main prayer hall help in the passive control of heat transfer. Bricks are left exposed in the vaults and domes, but are plastered elsewhere. All frame-work necessary for shaping arches and vaults was prepared on site with plywood. The pre-cast decorative parapets were also fabricated on site; however, the doors, windows, railings and screens were all manufactured in the contractors' workshop in Jeddah. They are made of seasoned teak wood, specially treated to withstand extreme heat.

Traditional brick construction technology has been applied. Brick was supplied by a local manufacturer in Medina in accordance with the architect's specifications for sizes and strength. Three types of brick were used, with dimensions of 11 x 20 x 24 cm, 11 x 17.5 x 24 cm, and 7 x 17.5 x 24 cm, with compressive strengths of 180, 220 and 272 kg/cm^{2}respectively. Brick walls are all designed to serve both as structural support and spatial enclosure.

Since the mosque is composed with intricate decoration and extensive details, the large space below the prayer hall - the present mechanical room - was transformed into craftsmen's *ateliers*. It was used as a school for experimentation and for training, ranging from the design of the complex form-work to each and every construction detail.

Interior decoration is of gypsum plaster. External floors are finished with granite with differing degrees of smoothness. The floor inside the main prayer hall is finished with clay floor tiles as a hard base onto which is placed the carpet. The carpet for the prayer hall floor was specially designed by the architect. The design follows the pattern and size of traditional Bedouin carpets called *seyah*. It is made of pure wool, and the cost was SAR 250 per m^2. It was supplied by a Saudi manufacturer in Jeddah.

The prayer hall, the living accommodations of the *Imam* and the *Muezzin*, and the maintenance personnel area are cooled with a 350 ton capacity air-conditioning unit. The *mihrab* area is served with a separate 5 ton capacity unit. Three air handling units are placed in the mechanical room below the prayer hall, and the mechanical room is naturally ventilated. Two water tanks, each with a capacity of 36'000 litres, are placed in the same room. There is no over-head water tank; water is supplied by means of three 7.5 horse-power pumps that function automatically. Water normally comes from the city water supply line; however, in the peak season of *Hajj*, additional water is required and purchased from private suppliers. The water disposal system is not connected with the city sewerage system, so a septic tank is used, instead.

The fire fighting system is provided with smoke detectors fitted in appropriate places. Energy consumption is 0.75 to 1.00 mega-watts of electricity for lighting, air-conditioning and other mechanical equipment. No stand-by generator is installed, as power failures are rare.

g. Origin of Technology, Material, Labour Professionals

Traditional brick construction technology has been utilised with maturity and refinement. Most of the major construction and decorative materials were produced locally, except the teak wood, the chandelier, and electrical and sanitary fittings. The chandelier was imported from Istanbul.

The entire labour force was foreign. Around 40% were skilled and nearly 60% were unskilled workers. During the peak construction period 550, workers were employed in two shifts. The labour force came from as many as 21 nations. Brick work was mostly undertaken by Pakistani, Indian and Turkish workers. Finishing and form-work for arches and squinches was mostly performed by Turkish labourers. For the gypsum decorative work and calligraphy, 120 craftsmen were employed from Morocco.

The architect of the project is Abdel Wahed El-Wakil, an Egyptian. He practices internationally, and operates from his London office in the United Kingdom.

The contractor was the Binladin Organisation, Medina, the largest builder in Saudi Arabia.

The Project manager was Jaffar Tayar, a Turk employed by the Binladin Organisation.

IV. Construction Schedule and Cost

A plaque on top of the main entrance door gives the date of completion of the mosque in both the Islamic and Gregorian calendars. It reads 30/3/1408 H and 21/11/1987 A.D. The construction

period of the project was two years, and design work continued during this period. The previous Technical Review indicates the cost of the project as SAR 30 million (USD 8 million), or SAR 7'142 (USD 1'905) per m^2. However, this cost figure was not confirmed by the builder at the time, nor was a new figure suggested. The project was financed from the personal funds of King Fahd Ibn Abdul Aziz, as indicated in the mosque brochure.

The average construction cost of residential buildings is approximately SAR 1'200 (USD 320) per m^2. It appears from the only available figure that the cost of the mosque was nearly six times more expensive than ordinary constructions. However, it seems that cost was not an important factor, as the project was sponsored by the King. Maintenance is contracted to the Binladin Organisation, who were also responsible for the construction. (Maintenance costs could not be ascertained, either). Not a single cost-related question was entertained during the review.

V. Technical Assessment

a. Qiblatain Mosque is among the most extensively used mosques not only in Saudi Arabia but also in the Muslim World. Historical significance binds all pilgrims to visit and pray in this mosque. Use of the mosque is at a peak during the month of *Ramadan* and the *Hajj* season, and normal at other times. Occupancy at different prayer times is as follows :

Fajr	prayer at dawn	2 rows	150-180 persons
Dhuhr	prayer at noon	3 rows	225-270 persons
Asr	prayer at afternoon	3 rows	225-270 persons
Maghreb	prayer at sunset	10 rows	750-900 persons
Isha	prayer at night	10 rows	750-900 persons.

Note: each row can accommodate 75 to 90 persons.

More people attend the *Maghreb* and *Isha* prayers simply because they are after office hours, when the mosque is used by residents from the adjoining neighbourhood. On Fridays during the *Jami'* prayer, the entire mosque, both inside and outside, is filled. During the special dawn prayer on *Eid*, the congregation extends beyond the main road.

In the month of *Ramadan*, pilgrims visit Saudi Arabia for *'umra* and they travel from Mecca to Medina to offer special prayers in holy places. During this period a special prayer, *tarabi*, is followed by the *Isha* prayer at night and the mosque remains filled with people. During the *Hajj* season, the mosque is fully occupied at the time of each of the different prayers. Almost 100 to 150 coaches crowd the parking area.

b. As the mosque is painted white, it reflects much of the solar radiation, and the heavy, thick walls provide thermal control by reducing heat penetration. The building configuration and orientation help to keep parts of the approach court in shade and this also reduces heat build-up. During normal use, ventilation and air-conditioning systems perform well; however, in peak periods when the mosque is heavily frequented, the air-conditioning system has insufficient capacity to quell natural odours.

The prayer hall is lit with deep-set windows in small apertures. Natural light is supplemented with artificial light from large and small chandeliers. The overall quality of lighting inside the prayer hall is soothing and pleasant, adequate to read the *Quran* and conducive to meditation. At night, a dream-like atmosphere is created when the entire mosque with its domes and minarets glows in white light against a dark sky.

c. The architect was motivated here, as in his other projects, to explore the potential of local materials, technology and crafts which are fast disappearing under the pressure of modernised western technologies. The enormous possibilities for contemporary use of traditional building

crafts, with the help of simple materials and methods, have been profoundly expressed in the design and execution of the mosque, and the craftsmen's touch of hand and mind can be felt in every detail of the building.

d. The builder, the Binladin Organisation, is responsible for cleaning and maintenance. The mosque is very well maintained by a staff of forty people who take care of general cleaning, and of the operation and servicing of mechanical and electrical equipment. During the peak seasons, up to eighty people are engaged to perform these same tasks. Pigeons are discouraged by the installation of plastic strips; the "hot-foot" strip system which was previously installed proved to be ineffective.

Some of the maintenance problems result from the specific patterns of behaviour of pilgrims coming to Medina from many different Islamic cultures. Initially, sophisticated water taps were installed for ablutions and operated automatically upon touch. However, pilgrims from remote areas of the world were not acquainted with such sophisticated equipment, and the taps had to be replaced with less sophisticated ones.

Arabs remove their footwear only upon entering the main prayer hall, but people from other Islamic cultures remove their footwear on the first step of the mosque. As a consequence of this custom, water from the ablutions area has been tracked onto the carpet in the prayer hall, causing some deterioration.

No major maintenance work has been required for the reparation of cracks, failure of joints or structure, or any other items of a serious nature.

e. The most important design feature of a mosque, the minaret, has been applied here to serve more than its symbolic purpose. A minaret has been placed immediately adjacent to the road to serve as an imposing element on the axis of the approach road, and can be viewed from some distance. At closer distance, one is invited by the wide steps leading to the forecourt on the same axis of the minaret. As one climbs the stairs, the entrance portal gradually appears and draws attention, while the minaret recedes from vision. The entrance portal beckons movement from outer to inner space through a transitional corridor, *majaz*, which gives access to the prayer hall through a series of doors. (The main door on the *qibla* axis was later closed with a wall in order to give further emphasis to the two *qiblas*.) The story of the two *qiblas* is written in six languages on the wall of the prayer hall. Inside the prayer hall, the first view is of a low decorative ceiling that covers the first two bays and then suddenly opens into a large volume of space with high domes and vaults where "heavenly" light seems to filter through the openings around the main dome. It is, indeed, a revealing experience, from beginning to end. Movement, sequencing, and timing are all so well harmonised that one is totally absorbed by the spiritual ambience of the spatial enclosure.

The elegance and beauty of the mosque is enhanced by the overall simplicity of the whole and the painstaking detail of its parts. Sensitive articulation of form and space within the complex brings a persistent sense of order and continuity to the design. The design is complete in itself and stands in a free relationship with nature as a white sculpture in a grey landscape. It was not the intention of the design to merge the building with the surroundings, but to stand clear from them as a dominant form, thus serving as a focal point.

VI. Users

a. Qiblatain Mosque is used by Muslims from all over the world, with diverse cultural and economic backgrounds. Due to its specific spiritual importance, it is used intensively during the *Hajj* season and the *Ramadan* period.

At other times, it is used by residents from all over the city of Medina as well as by the regular users from the surrounding neighbourhood. Nevertheless, as the holy city of Medina is visited all the year round, new pilgrims are introduced to the mosque during every prayer.

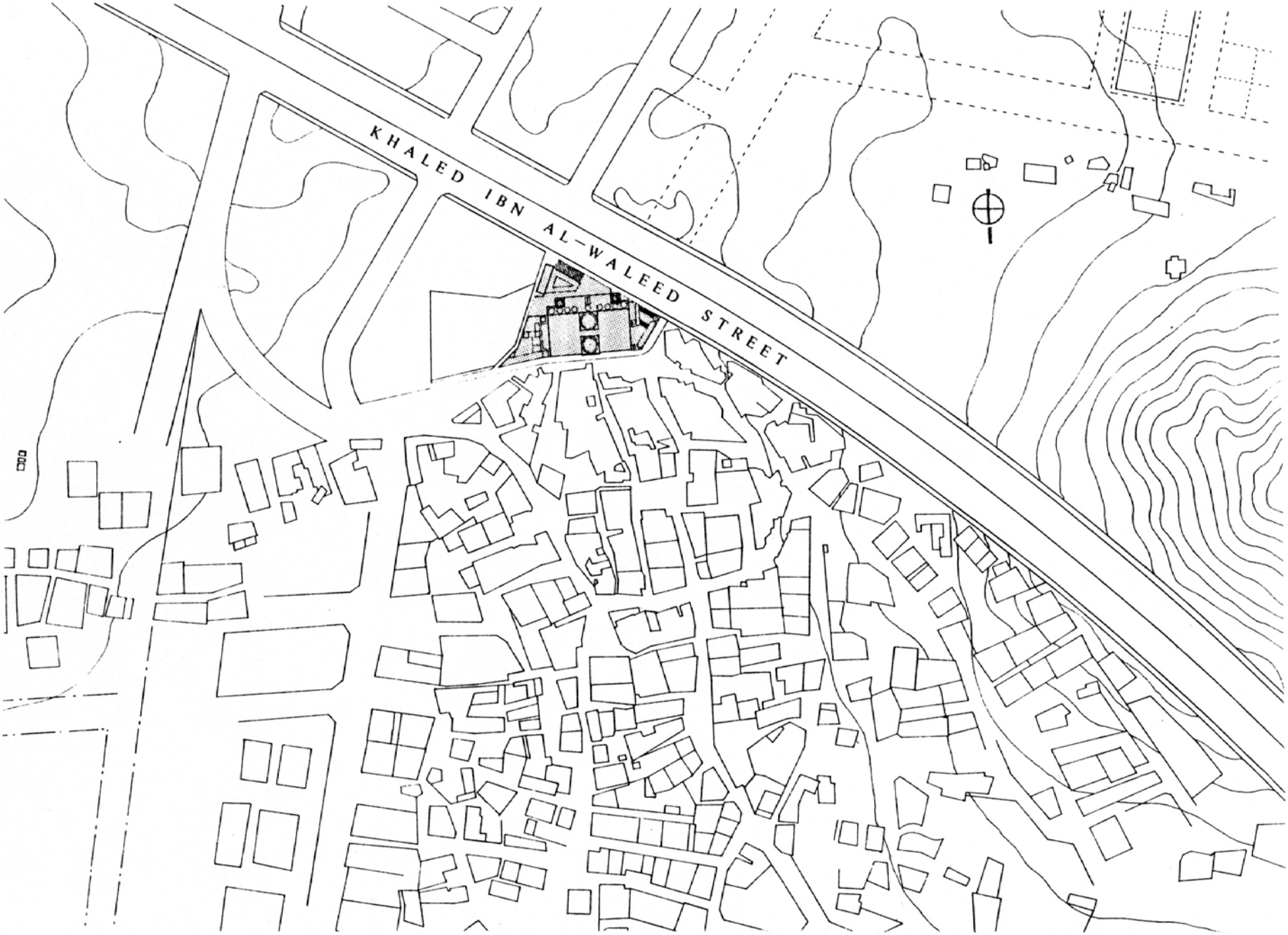
b. In general, people are very appreciative of the mosque and they consider it a splendid work of architecture. The client is a proud owner of the mosque. The note written by the Deputy Minister of Hajj and Awkaf in the visitors' book clearly indicates his great satisfaction with the mosque design. He expresses that Qiblatain Mosque, in its new design, has attained the attributes of beauty, magnificence and splendour. The architect is lauded for his ability to convey the true measure and value of Arabic and Islamic architecture using traditional norms which accord with the environmental context. The project manager is also given due credit for developing an *atelier* considered to be a training school for building art and craft.

It is important to note that the client proudly considers the Qiblatain Mosque and a series of other mosques designed by the same architect to be great achievements. It is the client's belief that the series of mosques will be able to protect and restore Islamic tradition. Moreover, it is also a point of pride and accomplishment that these magnificent buildings have been designed and developed by Muslims free from external influences. It is presumed that these mosques will serve as models for the future.

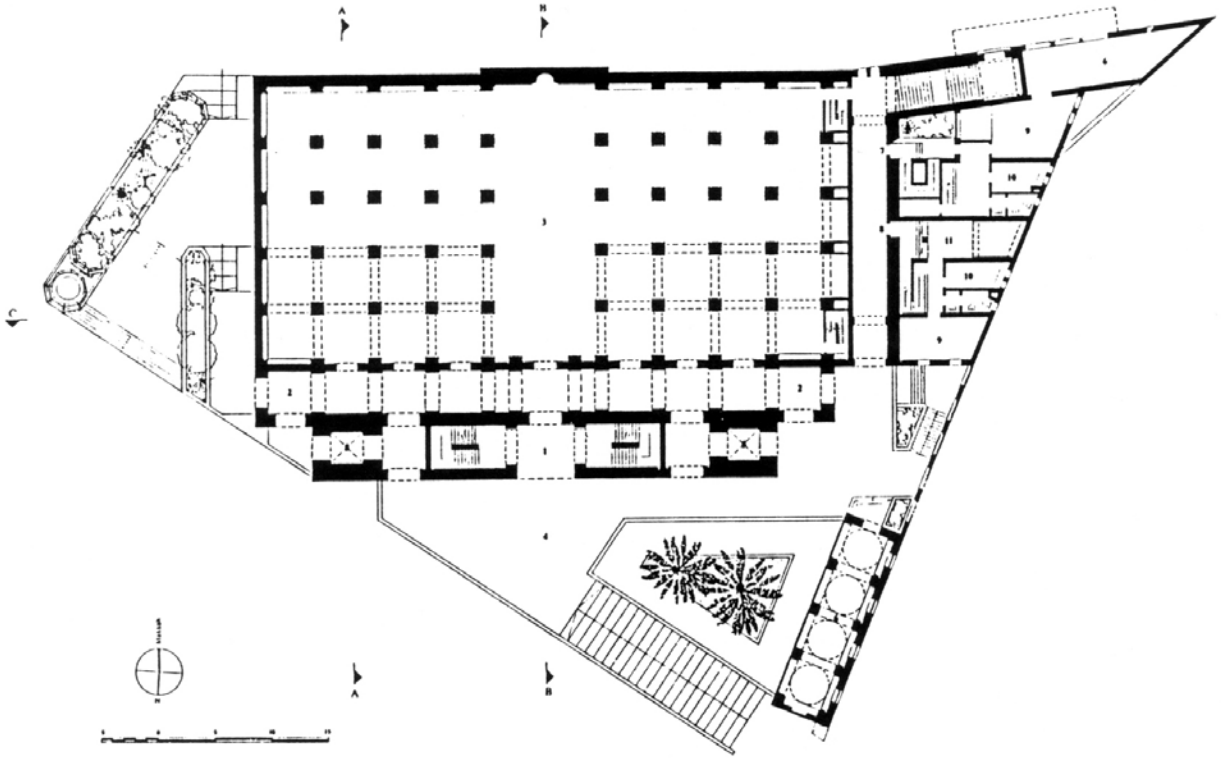
VII. Persons Involved

Client	Ministry of Hajj and Awkaf, Jeddah, Saudi Arabia. *Key Person*: Excellency Husam Hussein Khashoggi, Deputy Minister.
Architect	Abdel Wahed El Wakil, London, United Kingdom.
Supervisor	Jaffar Tayar Kazan, Project Manager, Binladin Organisation.
Craftsmen	Salah Maliani, leader of the Moroccan craftsmen (gypsum decoration). Kudret Akan, Cedetas Company, Turkey (chandelier design).

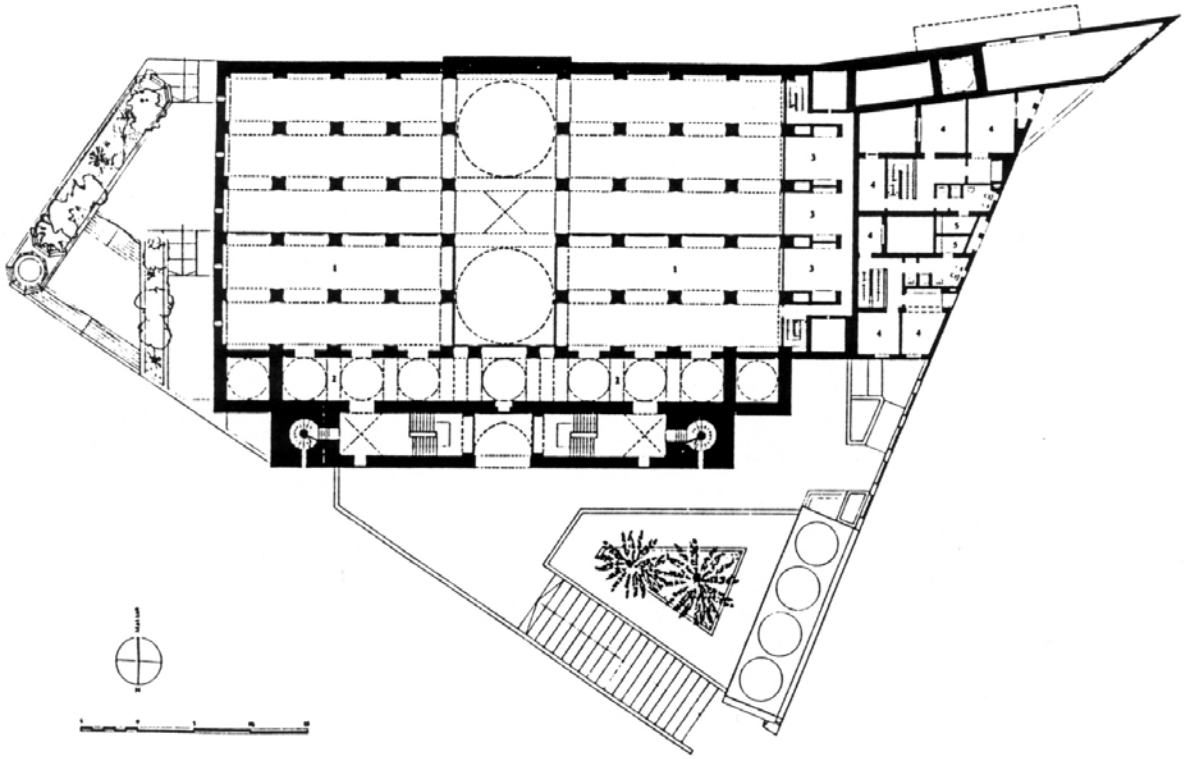
Abu H. Imamuddin
Dhaka, June 1992.



Qiblatain Mosque: Site Plan

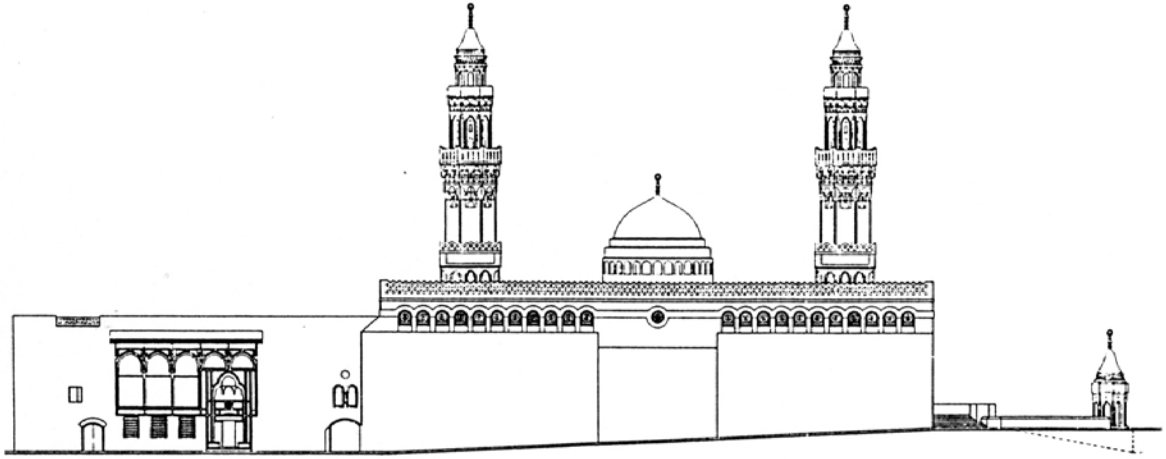


Qiblatain Mosque: Level 2

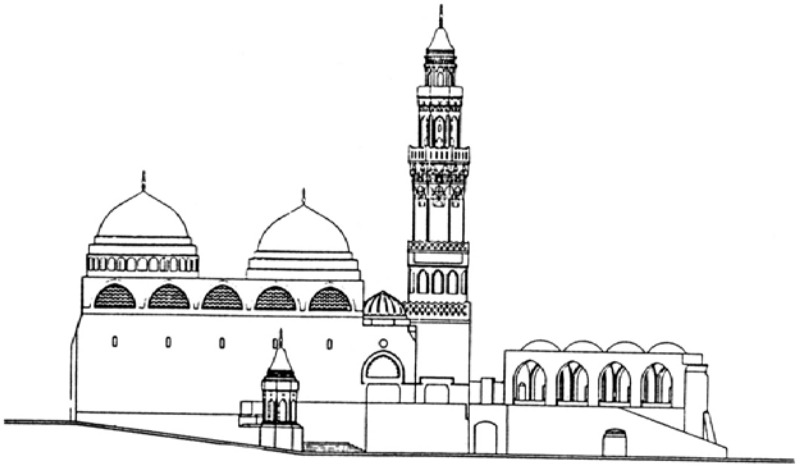


Qiblatain Mosque: Level 3

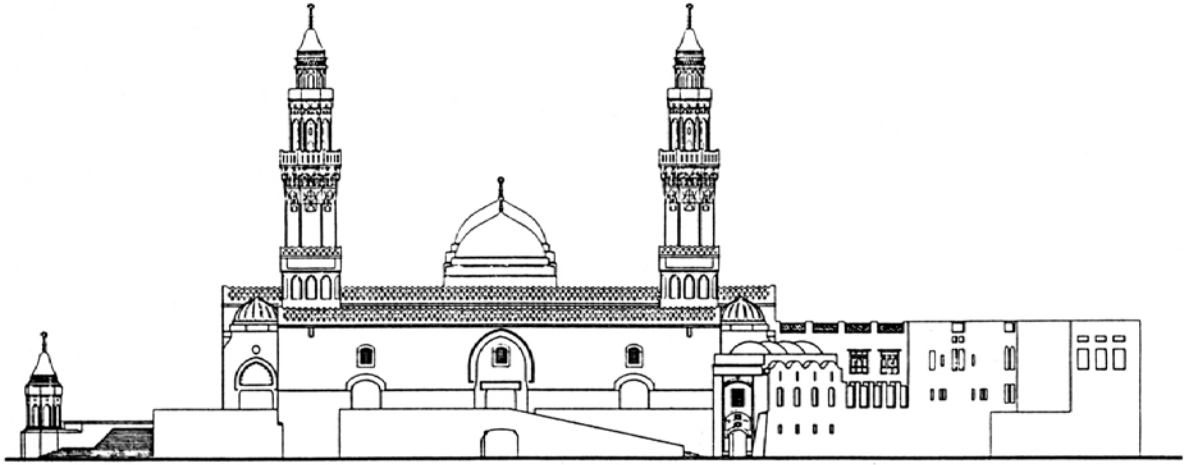
Qiblatain Mosque, Medina, Saudi Arabia



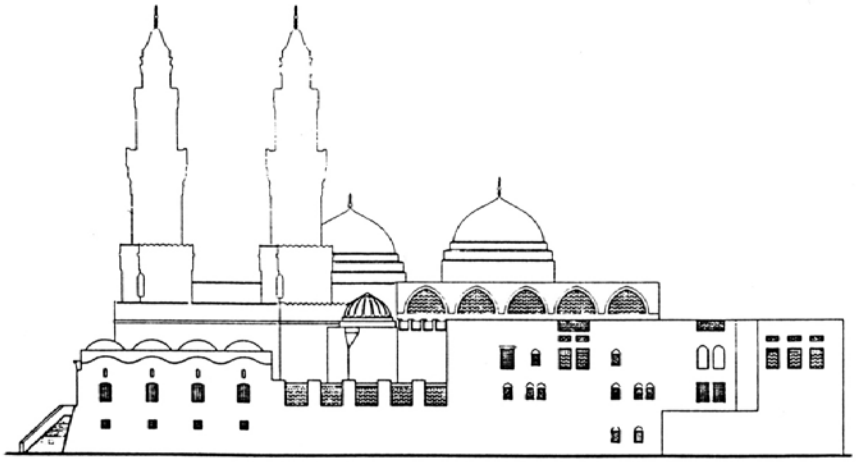
Qiblatain Mosque: South Elevation



Qiblatain Mosque: East Elevation



Qiblatain Mosque: North Elevation



Qiblatain Mosque: West Elevation

Project

Qiblatain mosque is part of a larger programme of mosque construction initiated by the Ministry of Hajj and Awkaf. Under this programme, a series of large and small mosques were built, each of which referred to traditional architectural language and vocabulary as their source of inspiration. The site of the mosque is of particular religious significance to Muslims: worshippers praying at Qiblatain are said to have first changed their direction of prayer from the qibla in Jerusalem to the qibla in Mecca in accordance with Divine Will. The design, ornamentation and detailing of the new mosque is aimed at enhancing the sense of history and sanctity, and at creating an appropriate atmosphere for meditation for millions of pilgrims visiting the site every year.

Site

The triangular shaped site is situated to the west of Medina. The land is largely flat with a slight slope in the south-east corner and an 83 m frontage to the adjacent main road. The existing 30 years old reinforced concrete structure was demolished to clear the site for the new mosque.

Description

Qiblatain mosque can accommodate up to 2'000 worshippers. The main prayer hall adopts rigid orthogonal geometry and symmetry which is accentuated by the use of twin minarets and twin domes. Living accommodations for the Imam, the Muezzin and the caretaker are discreetly grouped in one block to the west of the main structure. The difference in level at the south-east corner of the site has been exploited to incorporate a sub-basement level which serves as the ablutions area for worshippers. To the north, where the ground level is lower, the prayer hall is raised one storey above ground level. Entry to the prayer hall is from the raised courtyard, also to the north, which can be reached by stairs and ramps from the main directions of approach. The prayer hall consists of a series of arches which support barrel-vaults running parallel to the qibla wall. These vaults are interrupted by two domes which establish an axis in the direction of Mecca. The main dome to the south is raised on a drum of clerestory windows which allow light to filter into the interior directly above the mihrab. The second, false dome is linked to the first by a small cross vault to symbolise the transition from one qibla to another. Below it, a replica of the mihrab found in the lower chamber of the Dome of the Rock in Jerusalem reminds onlookers of the oldest extant mihrab of Islam. Externally, the architectural vocabulary is inspired by traditional elements and motifs in a deliberate effort to offer an authentic image for an historic site.

Construction

Reinforced concrete foundations support loadbearing brick pillars, vaults and domes. The heavy mass of the brickwork was crucial to the architectural expression and serves to provide a cool interior due to its high thermal absorption capacities. External walls are rendered with smooth cement with a whitewash finish. Interior finishes include marble floors and carved, solid teak balustrades. The labour force was largely imported.

Project Significance

The Qiblatain mosque is one of a number of mosques designed by the same architect which have been built to demonstrate the versatility of traditional materials and construction techniques. The monumental nature of the building reinforces the historic significance of the site.

Qiblatain Mosque, Medina, Saudi Arabia

Medina, Saudi Arabia
Address
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Architect
Abdel Wahed El Wakil
London, United Kingdom
Client
Ministry of Hajj and Awkaf
Jeddah, Saudi Arabia
Consultants
Project Management
Jaffar Tayar
Jeddah, Saudi Arabia
Contractor
Binladen Organisation
Medina, Saudi Arabia
Design not available
Construction not available
Occupancy October 87
Site Area 3'920 m2
Ground Floor 3'070 m2
Total Floor 4'200 m2
Costs
Land not available
Global 30'000'000 SAR
8'000'000 USD
Construction
per m2 7'142 SAR
1'905 USD
Exchange USD = 3.75 SAR, Saudi Arabian Riyals
Programme Mosque
-basement
.ablutions
-ground floor
.main entrance
.side entrance
.prayer hall
.minarets (2)
.loggia
.Imam, Muezzin and caretaker's accommodation
-first floor
.access gallery
.ladies' mezzanine
.classrooms (3)
Building Type 612
0877.SAU

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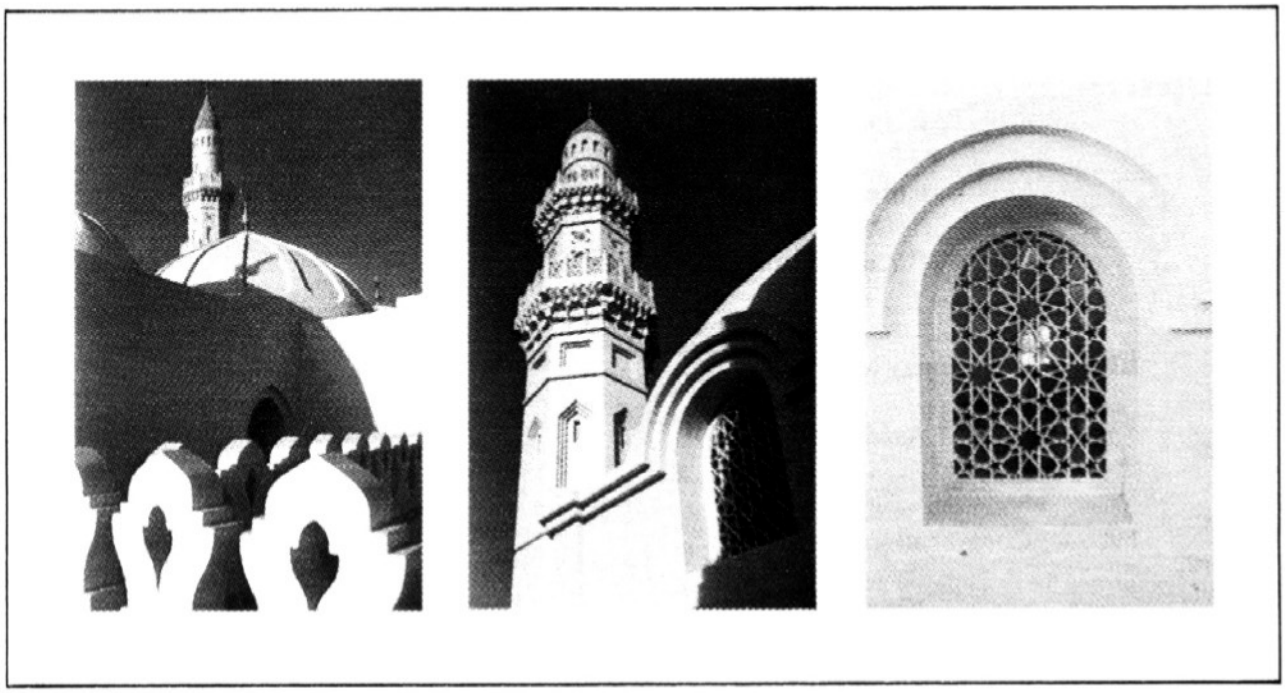
0877.SAU

Qiblatain Mosque, Medina, Saudi Arabia

1989 Technical Review Summary
by *Mohammad Al-Asad*

Saudi Mosques

Jeddah & Medina, Saudi Arabia



Architect
Abdel Wahed El Wakil
London, United Kingdom

Client
Municipality of Jeddah &
Ministry of Pilgrimage and Endowments
Jeddah, Saudi Arabia

Completed
1986 - 1988

Ruwais Mosque, Jeddah, Saudi Arabia

Introduction

In the course of the past ten years, the Egyptian architect Abdel Wahed El-Wakil has designed over a dozen mosques in Saudi Arabia. The first of these religious structures was the Sulayman Mosque, completed in 1980. This mosque was commissioned by Abdullah al-Sulayman, the same person for whom El-Wakil designed a nearby residence. The mosque and residence caught the attention of Muhammad Saïd al-Farsi, then mayor of Jeddah. In turn, al-Farsi introduced El-Wakil to Husam Khashoggi, the Deputy Minister of Pilgrimage and Endowments. The Ministry of Pilgrimage and Endowments seems to have been interested in introducing new vocabularies to the large number of mosques designed in Saudi Arabia. Consequently, the ministry entrusted El-Wakil with designing a small mosque along the Jeddah corniche on a land donated by the city municipality. At the same time, the municipality commissioned El-Wakil to design another mosque along the corniche. These two mosques were followed by a series of mosques commissioned by the Municipality of Jeddah, the Ministry of Pilgrimage and Endowments, as well as members of the private sector. Seven of these mosques are being considered for this award.

While these mosques differ in size, formal composition, and sources of financing, they nonetheless are united by a number of general characteristics. Firstly, they can all be referred to as revivalist structures. All draw heavily, and often very directly, on various historical prototypes belonging to the architectural heritage of the Islamic world. Therefore, influences from a number of architectural vocabularies can be found in the design of these mosques, including those of the Tulunids, Mamluks, Ottomans, as well as the vernacular rural architecture of Egypt, the architecture of Islamic Iran, and the traditional architecture of the Saudi regions of Najd and the Hijaz.

Before initiating this assessment, a few remarks should be made concerning the chronology of these mosques. All seven were designed and completed within the relatively short period of six years. In fact, the dates of design, as well as initiation and completion of construction for these mosques overlap. As a result, one should not attempt to identify any course of architectural evolution, but instead, should treat these mosques as monuments belonging to one period.

All these mosques share strong similarities in the use of materials and construction technologies. Their construction is based on the utilisation of load bearing brick walls, vaults and domes. Therefore, these structures are built of hollow baked bricks held together with mortar. Most of the brick surfaces are covered with white plaster, and in some cases, with granite. However, the interior of the vaults and domes are generally left exposed, and are only coated with a layer of brownish paint. As for reinforced concrete, its use is limited to specific elements which include the foundations, lintels, and flat ceilings.

Therefore, the skeletons of these structures are built of brick and, to a lesser degree, concrete. While the brick and concrete are covered mainly with plaster, a wide range of other materials are also utilised for finishes. For example, glass reinforced gypsum or cement was poured into plastic molds to form *muqarnas* vaults, decorative patterns, and even non-structural columns. Wood is used for a variety of elements including *minbars*, screens, shelves, and Quran stands. Marble and granite are utilised for floors, walls, *mihrabs*, and even minaret balconies and caps. Terra-cotta is used for floors; bronze for decorative panels, and brass for window grilles and chandeliers. In general, the finishes consist of expensive materials requiring skilled craftsmanship for their conversion into finished products.

Most of the mosques, with the exception of the smaller ones, are mechanically cooled. Air conditioning ducts are placed within the thickness of the brick walls. As for outlet units, they are often covered with plaster or wooden screens. At the same time, and for all of the mosques, the effects of natural ventilation can be utilised. However, such an option is not very effective during the hot and humid summer months, and during the occasional sand storms, which instead of bringing cool air into the buildings, let in large amounts of dust. Lighting is provided through chandeliers as well as track-mounted fixtures attached to the walls and vaults. Often, lighting fixtures and speakers are incorporated into the architecture itself. This is obvious in the Aziziah Mosque, where tie beams are utilised to hold neon lights, and the speakers are placed within the spandrels of the interior arcades.

Ruwais Mosque, Jeddah, Saudi Arabia

As is usually the case in Saudi Arabia, the sources of materials, labour and construction technology are quite diverse. Some of the materials, such as bricks, cement, as well as certain types of marble and granite are of local origin. Otherwise, much of the remaining materials, in both raw and finished forms, are imported. As for the craftsmanship, some of it, as is the case with most of the woodwork, is carried out in local shops. However, the craftsmen are almost always foreigners coming from countries and regions such as Egypt, Turkey and the Indian subcontinent. In addition, there is an importation of crafted products. Therefore, most of the chandeliers are specially manufactured in Turkey or the United Kingdom, the tile work originates from Turkey, while the plastic forms used for the making of *muqarnas* vaults and other decorative elements, are produced in the United Kingdom. The mechanical and lighting equipment is usually imported from Western Europe and North America.

This diversity of sources is also reflected in the identity of the personnel responsible for the conception and construction of these mosque. The architect himself is an Egyptian based in London. His office employs a staff including a number of nationalities. The contractors such as the Binladen Organisation and the Harithy Construction Division are Saudi firms, but are mainly staffed by foreigners. As a result, the engineers as well as the skilled and unskilled labourers come from various regions of the Arab world, Turkey and the Indian subcontinent. Often, the nationality of the project engineer determines that of both skilled and unskilled labourers.

The mosques differ drastically in terms of overall budgets and cost per square metre. This is partly the result of differences in size, since the areas of these mosques range from 195 sq m to about 14'000 sq m. When examining the cost per square metre, it is observed that while a mosque such as Aziziah was built for a cost of SR 4'082 Saudi Riyals per square metre (US$ 1'100/sq m), the mosque of Binladen was constructed for about six times that amount, or SR 24'390/sq m (US$ 6'600/sq m). Such large differences are due to the choice of materials, and also to the complexity of the utilised architectural forms. Therefore, Aziziah Mosque, which was built on a relatively tight budget, utilises simple forms and only incorporates simple decorative elements. Still, even this mosque is considered as relatively expensive in comparison to other ones built in Jeddah. In general, and from the point of view of both the architect and clients, the issue of cost does not seem to have been an essential factor in the designing of most of these mosques.

These structures can be categorised according to two criteria. The first is patronage. Here, a number of clients are involved. These are the Ministry of Pilgrimage and Endowments, the Municipality of Jeddah, and various wealthy individuals and families. While some of these mosques have been commissioned exclusively by one of these groups, others are the result of a collaborative effort between two or more parties. The other criterion of categorisation is that of size. Accordingly, the mosques can be divided into three groups, the small mosques (Island, Corniche and Binladen), community mosques (Aziziah), and congregational mosques (King Saud, Qubba and Qiblatayn).

Finally, a few comments should be made concerning location. All the mosques considered here are located in two cities, Jeddah and Madina. Both cities are situated in the western Saudi Arabian region of the Hijaz. Jeddah, which lies along the Red Sea, is the city in which the Island, Corniche, Binladen, Aziziah and King Saud Mosques are found. Historically, this city's importance was established when the Caliph Othman chose it as the port of Mecca in 646 AD. As a result, it has evolved as a cosmopolitan commercial centre which received both goods and pilgrims from different parts of the world. Today, and along with the capital Riyadh, Jeddah, which has an estimated population of over one million inhabitants, is one of the most important cities of Saudi Arabia.

The topography of the land on which Jeddah is located is generally flat. As a result of the city's high levels of humidity (which reach an average monthly maximum of 80-85%) and its high temperatures (which reach a monthly average of 30°C), its climate can be extremely uncomfortable. The amount of rainfall, which mainly occurs between April and October, is small. As for its soil, it is sandy and not suitable for cultivation. Nonetheless, impressive efforts have been made to provide the city with a green cover. This has been achieved through the importation of soil, and the use of desalinised water from the Red Sea.

Ruwais Mosque, Jeddah, Saudi Arabia

Historically, and in comparison to other cities of the Arabian Peninsula, the architecture of Jeddah has been cosmopolitan in nature. The city's traditional architecture reflects both Ottoman and Egyptian influences. Of course, much of its traditional character has been transformed significantly through the intense building activity that has taken place since the 1950's. As a result of this process, a good number of the city's older buildings have been replaced with a diverse range of modern structures. Nonetheless, commendable efforts have been made to preserve parts of older Jeddah.

The other two mosques considered in this report are located in the city of Madina. Madina is of prime importance in the context of the Islamic world. It is the city in which the Prophet Muhammad established the first Islamic state. Also, it is here that his house, mosque and place of burial are located. While it may have lost its political significance soon after the Caliph Ali moved the capital to Kufa in 656 AD, it remained a major religious and intellectual centre. More importantly, during the pilgrimage season, it is visited by an estimated two million Muslims from all over the Islamic world.

Madina, which lies about 160km east of the Red Sea, is located in an oasis. Much of its soil is fertile, and the city is known for its orchards. While its topography is generally flat, a number of hills are found in its vicinity. As for the climate, it is cool in the winter, and hot, though not humid, in the summer. Rainfall is slight, and mainly occurs during the winter.

Much of the old city has been destroyed as a result of the successive enlargements to which the Prophet's mosque has been subjected. As a result of the latest additions, which were initiated in 1983, the mosque is being enlarged to cover an area of 82'000 sq m. Generally speaking, and because of King Fahd's strong interest in Mecca and Madina, both cities are undergoing a massive process of rebuilding.

Small Mosques: Island, Corniche, and Binladen Mosques

This group of mosques consists of three structures none of which exceed 400 sq m in area. These small mosques have been intended to fulfil a number of functions. On the one hand, they have been conceived as sculptural elements accentuating the Jeddah landscape. In this manner, they present us with architectural equivalents to the numerous sculptures that have been placed throughout the city. In addition, it was intended to place these structures in areas of the city that had not yet been served by mosques. The corniche zone was one of these areas. The placement of a series of mosques conveniently located along the corniche would provide the large number of visitors frequenting that part of the city with places of worship. Otherwise, the visitors would have to perform their prayers on the pavement or the beach itself.

Island Mosque

This mosque was the first to be commissioned by the Ministry of Pilgrimage and Endowments. It is very much the result of a collaborative effort between the Ministry and the Municipality of Jeddah. On the one hand, it is the former mayor of Jeddah, M. S. al-Farsi who had brought El-Wakil's work to the attention of the deputy Minister of Pilgrimage and Endowments, Husam Khashoggi. Also, it is the municipality which donated the site on which the mosque is located.

The site of the mosque consists of an artificial Island situated just off the Jeddah Corniche. The island is connected to the mainland by a narrow bridge. Over the pat decade, the corniche area has evolved to become an extremely popular recreational area, and is frequented not only by the inhabitants of the city, but also by families from different parts of the Arabian Peninsula. The area abounds with recreational parks, restaurants and also with non-figural sculptures. In addition to consisting of highly abstract geometrical arrangements, more bizarre versions of these sculptures include enlarged Mamluk lamps and cars inserted into large blocks of concrete.

The site itself measures around 2'500 sq m while the mosque covers an area of 400 sq m. The design of this mosque is a relatively simple one. It consists of a rectangular prayer hall, flanked by a porticoed courtyard, which is connected to the main entrance, as well as a square minaret. The prayer chamber is surrounded by aisles on three sides, and is topped by a dome resting on an octagonal drum. Concerning the exterior façades, those facing the mainland are treated in a rather closed manner, and thus contain a small number of openings. However, on the opposite side, facing the sea, the mosque opens up towards the courtyard, which in turn faces the sea with an open arcade. The minaret, which is located at the northern end of the courtyard, is topped by a small dome and has a balcony with a wooden railing. The whole structure is treated as a pavilion in that it is open to the natural elements, and has no weather-tight windows and doors separating the exterior from the interior.

The mosque is constructed with load bearing brick and is covered with white plaster. Only the interior of the domes are left bare to be coated only with a layer of brownish paint. Other finishes include granite which is used for the patterned floor and the *mihrab*. Wood is utilised for the doors, shelves and railings. A large brass chandelier was originally suspended from the main dome. In addition, simple rows of *muqarnas* vaults decorate the minaret, and a row of crenellations, made of concrete covered with plaster, tops the inner façades of the courtyard. The landscaping is generally simple, and consists of a few plants and palm trees dispersed around the structure.

The design for the mosque was conceived in 1983. Construction was completed in March of 1986. The total cost amounted to SR 5'500'000, which is equivalent to about SR 13'750/sq m (US$ 3'700/sq m). These expenses were paid for by the Ministry of Pilgrimage and Endowments. However, the land was provided by the Municipality of Jeddah. Maintenance costs for this mosque are not available.

Functionally, the mosque seems to have fulfilled its intended purposes. While it may not be used heavily during the daytime hours of the weekdays, it is utilised to full capacity during the holidays and the Friday and night (or *'isha*) prayers. Also, and in spite of the fact that the mosque does not contain separate areas for male and female worshippers, it still is used by both. The men pray inside the prayer chamber while the women use one corner of the courtyard.

Since the mosque is not attended heavily during most weekdays, other functions have developed on the site. For example, and as a result of the mosque's location on the sea, as well as the existence of shaded areas facilitating the cool sea breezes, the mosque's courtyard at one point became popular among picnickers. This use prompted the municipality to limit access to the mosque by building a steel gate around it. In the final result, the mosque can be entered only during prayer time.

One of the main characteristics of this structure is its openness. Such a feature allows for striking views of the sea, and also takes advantage of the cool breezes coming from that direction. In fact, it was the architect's intention to rely exclusively on natural ventilation rather than air conditioning. However, such an open design has also rendered the mosque susceptible to the harsh natural elements of coastal Arabia, and no protection is provided against the water, salt, sand and humidity. In fact, these elements have already taken their toll on the structure. Therefore, the original white plaster now has a brownish colour, and some of it has begun to peel off. The floors, in spite of occasional sweeping, are usually covered with sand. Rust has eaten away the chain holding the large chandelier, which as a result, has been dismantled.

While this exposure to the elements requires continuous and careful maintenance, the mosque has received very little care. The structure has not been repainted since its completion. The wooden rails and doors suffer from chipping, and are in strong need of a protective coating. Also, not only has the main chandelier been removed, but the originally planned track lights have not been installed. Instead, neon lights have been placed in different parts of the structure.

A number of additions have been made to the structure. Generally, these additions lack in sensitivity. One is the already mentioned steel gate. While this gate may protect the mosque from possible vandalism or misuse, it has done much harm to the appearance of the original structure. Interestingly

enough, even this gate is now suffering from the effects of rusting. Also, a concrete annex containing a room for the keeper as well as toilets has been built off the northern façade of the structure. Other additions include a water tank placed to the south-eastern corner of the mosque.

In spite of the above mentioned maintenance problems, and a result of the mosque's formal composition and natural setting, the mosque still presents itself in a striking manner. The effect of its crisp white forms, contrasting against the sand, sea and sky remains a powerful one both in the day and at night. Architecturally, the mosque utilises a simple combination of forms, that of a square topped by an octagon and a dome, bordered by a porticoed courtyard and flanked by a square minaret. All in all, it provides for a powerful simplicity which has not been undermined by the lack of care and the indiscriminate additions that were built.

While an accurate assessment of the users' response to this structure can be achieved only through the aid of a survey, a number of comments concerning this issue can be made. The mosque does seem to be popular among the large number of visitors frequenting the corniche. The location of this mosque is welcomed by a population expressing a strong adherence to the performance of the prayers. Also, the site has taken on a number of other activities. As mentioned, until a fence was placed around the mosque, some people used to gather in the courtyard for picnics. In addition, the island on which the mosque is located has become popular among fishing enthusiasts who can be found there whenever the weather permits. Of courser, there are a number of complaints expressed by the users. One of them is the lack of maintenance. The other is the absence of any form of climatic protection against the elements. One user complained about the lack of glass windows and expressed the wish that air conditioning be installed.

The persons involved in the realisation of this mosque (and in addition to the architect) include the former mayor of Jeddah, M.S. al-Farsi, who originally conceived the idea of placing small mosques in striking settings along the corniche, and who in his official capacity of mayor, provided the land on which the mosque is located. The Ministry of Pilgrimage and Endowments commissioned and financed the mosque. Construction was carried out by Ganadilcom, while supervision was provided by Concenter, a consulting firm based in Jeddah.

Corniche Mosque

Much of the discussion provided for the Island Mosque is applicable to this second mosque, the Corniche Mosque. Both mosques are small structures located along the Jeddah Corniche, completed in 1986, and, as will be seen, have had the same history of maintenance problems.

The Corniche Mosque is located on land reclaimed from the Red Sea. The site measures around 1200 sq m, while the mosque itself covers an area of 195 sq m. While designed during the same period as the Island Mosque, this mosque was commissioned by the Municipality of Jeddah rather than the Ministry of Pilgrimage and Endowments.

In terms of size, this mosque is considerably smaller than the preceding one. However, it is also considerably more complex in its formal arrangement. The mosque is entered from the *qibla*, or eastern side, through a large chamber covered with a catenary vault. The chamber leads to a narthex which is open to the sky, and which separates the domed prayer chamber from a two-bayed portico overlooking the sea. To the southern side of the prayer chamber is an external staircase leading to the middle of the minaret. The minaret is of stubby proportions and consists of a relatively tall square base supporting a short octagonal shaft. The minaret's balcony rests on two rows of *muqarnas* vaults. A landscaping scheme was planned for the site, but has not been executed.

As with the Island Mosque, the structure is built of brick covered with plaster. The interior of the main dome is left exposed, and is covered only with a layer of bronze paint. Also, the mosque utilises a variety of materials for finishes. These include granite which is used for the patterned floor, brass for the chandeliers and lamps, and wood for windows and shelves.

The mosque was completed in December 1986. The total cost amounted to SR 1'500'000 or 7'690/sq m (US$ 2'000/sq m). As mentioned, the mosque was commissioned by the Municipality of Jeddah, which through the efforts of mayor al-Farsi, secured financing from private contributors. Unlike the other projects, this one had no general contractor. Instead, the president of Concenter, Abdel Wahab Khashoggi, whose firm supervised most of El-Wakil's mosques in Saudi Arabia, also functioned in the capacity of a project manager hiring the various subcontractors needed for the construction of this mosque.

Much of what can be said concerning the technical assessment of this structure is similar to that provided for the Island Mosque. Both mosques are open to the natural elements. They utilise the cooling effects of the breezes coming in from the sea, and thus dispense with air conditioning. In the case of both mosques, the effects of the sand, water, salt and humidity, coupled with poor maintenance, have taken their toll on the structures. For example, while the main chandelier has not been removed, rust already has begun to destroy the chain holding it. Also, a steel fence has been placed around both structures as protection against possible vandalism or inappropriate use. In both cases, water tanks as well as annexes containing toilets and a room for a keeper have been placed in the immediate vicinity of the structures.

Of course some minor differences do exist. For example, in the construction of an annex containing a keeper's room and toilets for the Corniche Mosque, some care has been taken to provide architectural continuity between this annex and the mosque. This is exemplified by the incorporation of crenellations, wooden doors and corner pylons in the design of the addition.

Still, and in spite of the effects of the natural elements and problems resulting from poor maintenance, the mosque remains among the more striking compositions along the Jeddah coast. Architecturally, it is more complex than the Island Mosque. In order to enter, a change of axis needs to be made. This is evident in the placement of a vaulted entry chamber from which one needs to make a 180 degree turn, and pass through an open narthex before reaching the prayer hall. Also, the Corniche Mosque is a more stylised structure utilising direct quotations from a number of architectural traditions. As a result, there is a reliance on Mamluk architecture as well as the vernacular architecture of the Egyptian countryside for the generation of forms.

As with the Island Mosque, this one is used heavily for the Friday and *'isha* prayers. While no separate area has been provided for female worshippers, the large entry chamber has become the customary place for that purpose. Otherwise, the same comments concerning maintenance and the lack of protection from the elements have been made by the users concerning this monument.

As for the persons involved in the conception and realisation of this mosque, they include the Municipality of Jeddah represented by its former mayor, M.S. al-Farsi, and the firm Concenter, which not only supervised the construction of the mosque, but also took on the responsibilities of project management.

Binladen Mosque

Unlike the two preceding mosques, this one, which has only recently been completed, is not located on the corniche, but more towards the interior of the city. It is situated in a low density suburban part of Jeddah containing a mixture of residential as well as commercial structures. Also, while the mosque was built on a plot donated by the municipality, the design and construction costs were covered by the Binladen Organisation, a company well known as one of the largest construction firms in Saudi Arabia.

The site consists of a triangular lot bound by a major street, al-Malik road, on the east. A smaller street forking off al-Malik road flanks the site on the west, while a still unpaved lane defines its southern end. The site measures 1850 sq m, while the structure itself covers an area of 123 sq m.

The mosque can be entered from the west through a porch consisting of three domed bays flanked by a hexagonal minaret with a square base to the south. The minaret also contains a balcony supported by *muqarnas* vaults. The porch leads into a rectangular domed prayer chamber. The dome, which contains a ring of windows at its base rests on a hexagonal arranged set of supports, two of which are free-standing, while the remaining ones are in the form of pilasters connected to the walls. The transition from the rectangle to the circle is made through four side squinches. In turn, each of these rests on two smaller squinches. A small annex containing toilets is located at the northern tip of the site. While a landscaping design has been prepared for the project, it has not yet been executed.

The mosque utilises a number of expensive finishes. These include a marble *mihrab* surrounded by a panel of carved plaster. Wood is used for the windows and the joinery entrance door. Brass chandeliers as well as track lights are used for lighting. The floors are covered with carpeting specially designed for this mosque.

The mosque was completed only recently, in September 1988. The total cost amounted to SR 3'000'000, or SR 24'390/sq m (US$ 6'600/sq m). Consequently, and in terms of cost per square metre, it is the most expensive of El-Wakil's mosques.

A technical assessment of this mosque is difficult to achieve, since at the time of the writing of this report, it was not yet open to worshippers. In fact, electricity services have not yet been provided for the site. I have been informed that the Ministry of Pilgrimage and Endowments is reluctant to open the mosque for the public before it has a full time keeper residing on the premises. Since there is no accommodation for a keeper, the situation remains unresolved.

Still, a number of comments relating to the use of this structure can be made. The mosque is intended to be cooled through the use of four air conditioning units located above the northern and southern windows of the prayer chamber. However, when visited in April, the prayer chamber was sufficiently cooled simply by opening its four windows, thus allowing the breezes to enter. Of course, the disadvantage of utilising this system of natural ventilation is that in addition to bringing in cool air, the breezes also bring in large quantities of dust. Concerning acoustics, the effects of echoing sounds could be heard in parts of the prayer chamber.

Architecturally, this mosque reflects a clear reliance on Ottoman prototypes, specifically Sinan's sixteenth century mosque of Sokollu Mehmet Pasa in Istanbul. The mosque is specially interesting in that the dome covers a rectangular area, not a square one. Therefore, the dome rests on a hexagonal arrangement of supports with four side squinches providing a transitional area between the supports and the dome. One variation on Sinan's solution is the use of two free-standing supports located about half a metre from the side walls. While architecturally interesting, the supports create a dead space between them and the wall.

Concerning those responsible for this mosque, they include the Municipality of Jeddah represented by its mayor M.S. al-Farsi, which commissioned the design of the mosque and donated the land. The Binladen Organisation paid for the costs of designing and executing the mosque, and also took over the responsibility of constructing it. As for supervision, it was carried out by Concenter.

Community Mosques: Aziziah Mosque

Aziziah Mosque

The Aziziah Mosque is one of four community mosques designed by El-Wakil in Jeddah. These medium size mosques are intended to accommodate between 1'000 and 2'000 worshippers, and aim to serve the worshippers of the neighbourhoods in which they are located. While initially they were commissioned by a variety of bodies, including the Ministry of Pilgrimage and Endowments, the

Municipality of Jeddah, as well as wealthy individuals and families, it is the last group which has sponsored these mosques, and has paid for most of the expenses. In the case of the Aziziah Mosque, it was commissioned by the Municipality of Jeddah, which through the efforts of Mayor al-Farsi, was able to convince two partners from the Jeddah business community, Abdel Aziz Ragab and Abdullah Silsila, to cover design and construction costs.

The mosque is located in a heavily populated part of the city, and replaces an older concrete mosque built some 20 years ago. The neighbourhood is characterised by a mixture of residential and commercial buildings. A pedestrian path borders the site on the *qibla*, or eastern side, a busy street on the north and a smaller street on the south. A vacant piece of land faces the site on the west. While there are plans to build a public garden on that lot, it remains empty, and currently is used as a parking area for the mosque. The site measures 1'455 sq m. As for the mosque itself, it covers an area of 1'715 sq m, of which 1'253 sq m are occupied by the ground floor.

A landscaping scheme was conceived for the site. It consists of paving the area surrounding the mosque with cement tiles, planting a row of trees along the mosque's northern end, and building a bed containing plants and trees along the *qibla* side. While the pavement and the row of trees are now in place, the concrete bed located in front of the *qibla* side remains empty, and has not been filled even with soil. Also, a separate mechanical room serving the mosque is located just off its southern side.

The mosque contains a highly compartmentalised plan. In it the men's prayer area, the women's prayer area, residences for the *imam* and *mu'ezzin*, teaching areas, as well as ablution facilities, functionally are all separated from each other, but nonetheless united within an overall rectangular arrangement. The women's prayer area and the residences are located on the upper floor, while the remaining parts of the mosque are on the ground floor. From the outside, the mosque is treated in a somewhat simple manner. A small dome placed over the *mihrab* area accentuates the *qibla* façade. As for the western or entry façade, it is characterised by a pencil-shaped minaret on its left handside, a projecting ladies entrance on the right, and a main entrance superseded by a raised terrace in the middle.

The interior of the mosque consists of a prayer area separated from the mosque's other facilities by an open passageway running along the site's east-west axis. The prayer hall is arranged according to a hypostyle plan consisting of six aisles arranged parallel to the *qibla* wall, and covered by pointed barrel vaults.

As with the exterior arrangement, the finishes utilised for this mosque are rather simple. The mosque's brick construction is covered with plaster. The lower 1.5 m of the walls are sheathed in granite, while the brick construction of the interior of the vaults and dome is left exposed. In general, and as a result of budget restrictions, decoration is kept to a minimum. *Muqarnas* vaults are generally not utilised. Little woodwork is incorporated in the design, and considerable areas of exposed brick can be found. The main vaulting system of barrel vaults is relatively simple. The only vaulting expressing any degree of complexity is that of the dome on squinches located in front of the *mihrab*. Carved plaster panels are used sparingly, and are found only around the windows. The one area for which a considerable expense has been placed is that of the *mihrab*, which is completely made of marble and contains *muqarnas* vaults.

The construction of the mosque was begun in 1986, to be completed in 1988 for a total cost of SR 7'000'000 or SR 4'080/sq m (US$ 1'100/sq m). Therefore, and in terms of cost per square metre, this is by far the least expensive of the mosques designed by El-Wakil. Maintenance costs, which are currently being paid for by the sponsors themselves, are not available.

Since the mosque is located in a densely populated neighbourhood, it is used heavily by the inhabitants of the area. Even for the daily prayers, the mosque is almost filled by worshippers. Another activity which has developed around the mosque is that of vendors displaying their merchandise after prayer time. The goods are usually placed on the pavement in front of the main entrance. While this activity contributes to the creation of a lively atmosphere, it also causes circulation problems.

The mosque is cooled by a central air conditioning system which seems to function adequately. However, ventilation is rather poor. One impressive feature of this mosque, is the almost complete incorporation of lighting, air conditioning, and acoustical systems within the architecture of the mosque. Thus, what initially may look as tie beams holding the arches of the prayer hall arcades, are actually neon light fixtures. Also, air conditioning outlets as well as speaker units are placed inside the spandrels or the arcades. In addition to the use of neon lights, a large chandelier is suspended from the dome of the mosque.

While the mosque was completed only last year, it already shows some signs of wear and tear. This is more the result of heavy use rather than poor maintenance. Black patches, mainly resulting from handling and friction have already developed at the corners and near the entrances. On the other hand, the mosque's southern wall is filled with soccer ball marks caused by children playing against that wall. Also, and since the landscaping scheme has not been executed completely, and the planned adjacent park has not yet been built, the area around the mosque has a certain dilapidated feeling to it. Finally, a large aluminium shelve containing shoe racks has been placed on the parapet of the mosque's front terrace, creating an eyesore. This is more disturbing when remembering that there is no need for these racks. Specially designed wooden ones are found in the mosque, and in any case most people leave their shoes on the floor of the front terrace. In contrast to the situation encountered with the exterior, the interior is in a very good condition.

From the point of view of both architectural composition and the use of finishes, this is the simplest of El-Wakil's mosques. However, the design of the exterior reflects certain weaknesses. The proportions are not well worked out, the small dome in front of the *mihrab* is barely noticeable, and there is little continuity between the design of each of the four front façades. However, and as with El-Wakil's other buildings, the details are carefully conceived and executed. Also, the minaret of this mosque is among the most elegant to be found in Jeddah. One interesting feature of the Aziziah Mosque is that the projecting ladies' entrance is more monumental than the centrally located one for the men.

However, it is in the planning and spatial composition that the strength of this mosque is to be found. The manner in which different areas of the structure are separated functionally, but nonetheless are united into one overall plan is effective. Also, the open passageway separating the prayer hall from the remaining parts of the mosque, while not used heavily, still provides for an interesting spatial arrangement. In addition, the mosque's hypostyle plan with its simple decorative scheme, the use of barrel vaults, and the incorporation of the lighting, acoustical and air conditioning systems into the architecture itself, are all very successful.

As for those involved in the conception of this mosque, they include the Municipality of Jeddah which initially commissioned the project, and Abdel Aziz Ragab and Abdullah Silsila, who paid for most of the expenses. Construction was carried out by the Harithy Construction Division of Jeddah, while Concenter was responsible for supervision.

Congregational Mosques: King Saud, Qiblatayn and Qubba Mosques

This group consists of three large mosques capable of accommodating congregations from 2'000 to 10'000 worshippers. They are all commissioned and financed by the Saudi government, represented by the Ministry of Pilgrimage and Endowments.

King Saud Mosque

This mosque is the largest in the city of Jeddah. It was built to replace a pre-existing mosque constructed some 30 years ago. The earlier structure, which was Jeddah's first reinforced concrete mosque, was found to be structurally unsound, and thus condemned and eventually pulled down. Construction on the new mosque was initiated at the end of 1984, and completed in December 1987.

The mosque is located on a 9'700 sq m city plot which is surrounded by streets on all four sides. Of these streets, Madina road, which borders the site on the west, is among the major thoroughfares of the city. While the structure takes up much of the site, the remaining free periphery areas are paved with granite and contain planted beds. The largest open area is located on the western side, or the area facing the front entrance. This open plaza is interrupted by stairs linking the street level with that of the front entrance. Across the street facing the mosque's eastern, or *qibla* side is a large parking lot. Plans are being made to enlarge this parking area by demolishing some of the adjacent buildings.

The mosque is characterised by a complex plan which is aligned with the surrounding streets on three sides, but is also aligned with the *qibla* direction on the fourth, or western side. The discrepancies between the street directions and that of the *qibla* are compensated for by the addition of triangular shaped areas. These additions contain ablution facilities, classrooms, storage rooms, offices and residences.

The mosque can be approached from entrances located around the periphery of the structure. The main entrance, or the one which imitates the monumental portal of the Mosque and Madrasa of Sultan Hasan in Cairo, is located at the north-western corner of the structure. This entrance leads into a large domed entry chamber. As for the ladies' entrance, it is located at the south-western corner of the mosque, in proximity to the ladies' prayer area which is made up of the south-western section of the mosque's prayer hall. Those entering through the main entrance need to make a number of consciously arranged axial shifts before reaching the courtyard around which the prayer hall is arranged.

The four *iwan* prayer hall covers an area of 5'000 sq m and is symmetrically composed around an east-west axis. In addition to the four barrel-vaulted *iwans*, its main features consist of a large dome reaching a span of 20 m, two smaller symmetrically arranged 12 m domes, and a series of small 6 m domes covering the remaining bays of the prayer hall. The structure's monumental proportions are also expressed in the heights. The minaret rises to 65 m, the large dome to 42 m and the two side ones to 30 m.

A variety of expensive finishes are utilised for the mosque. Granite, terra cotta, and specially designed carpets are used for flooring. Granite is also used to sheath the lower parts of the walls, and up to a height of 1.5 m. The upper parts are covered with plaster, while the interior of the domes and vaults are left exposed. Brass is used for chandeliers, and for the grille-work of the *sabil*, or structure containing a drinking fountain, which is located along the mosque's western façade. A variety of expensive woods, including teak, are utilised for screens, shelves, Quran stands, and the *minbar*. Also, it is for this mosque that modified glass reinforced cement (MGRC) is used on a large scale. This material is poured into specially made plastic molds in the shape of *muqarnas* vaults, as well as decorative columns and panels. After drying, it is dismantled and placed on a number of surfaces including those of the minaret and entry portal.

The mosque was constructed by the Binladen Organisation, and was completed in 1987 at a total cost of SR 60'000'000 or SR 7'851/sq m (US$ 2'100/sq m). It was financed by the Saudi Arabian government. More specifically, the structure's dedication panel states that the mosque was built from the personal funds of King Fahd ibn Abd al-Aziz. Maintenance is being carried out by the Binladen Organisation for an annual fee for SR 2'200'000.

Since this building has been conceived as Jeddah's major mosque, it is a frequently used one. However, and as a result of the mosque's massive size, it often is not utilised to full capacity, not even during the Friday prayers. However, and while the mosque can easily accommodate the large number of worshippers frequenting it, parking facilities have proved to be insufficient during periods of heavy use. Concerning other activities taking place on the site, they include those of vendors displaying their merchandise on the pavement adjacent to the side entrances. As is the case with the Aziziah Mosque, this activity mainly occurs after prayer time. Again, it provides for a lively atmosphere, but also contributes to circulation problems. While the mosque contains a number of rooms dedicated to teaching activities, these spaces are not yet in use.

Climatic issues have proven to be problematic in the case of this mosque. While the complex is centrally air conditioned, there also was the intention of utilising the effects of natural ventilation. Here, breezes passing between the windows of the domes and the courtyard, would be used to cool the prayer hall. However, the advent of a sandstorm just before the mosque was open to the public brought with it large amounts of dust into the structure. As a result, the windows were sealed shut, and the decision was made to rely exclusively on the air conditioning system. However, since the mosque opens onto a large courtyard, cool air tends to escape out of the prayer hall, making it uncomfortably warm during the hot summer months. As a result, the capacity of the air conditioning system has been doubled, and fans have been installed. Fortunately, these fans, which are suspended from the ceiling, create a pleasant visual effect.

The acoustic performance of the structure has also not been satisfactory, since there have been complaints concerning echoes. Consequently, a number of high powered speakers have been installed at low heights in different parts of the prayer area. Unfortunately, these speakers have not proven to be very effective; they tend to be uncomfortably loud. Also, and for those who choose to sit away from them, the effects of echoing sounds still remain a problem. In addition, and from a visual point of view, these speakers have not blended well with the rest of the structure.

Lighting is provided through both chandeliers and track lights. During the daytime, there is a reliance on both artificial and natural lighting. In general, the lighting is quite successful. While a pleasant atmosphere is created during the daytime, the lighting has a striking effect at night.

Since this mosque is the largest mosque in the city, and since the King has been personally involved in its completion, a great deal of care has been provided for it. As a result, it is extremely well maintained and well kept. Cleaning and maintenance crews are constantly found working in and around the mosque.

Architecturally, this is the most monumental mosque in Jeddah. Such monumentality is clearly expressed in the composition of its main entry portal, courtyard and three large domes. Also, it is a structure in which architectural historicism is clearly evident. Historical structures including the Mosque and Madrasa of Sultan Hasan in Cairo, the Great Mosque of Isfahan, as well as the ninetieth century *sabils* of Egypt, were used as prototypes. They all have been combined to create a new and unique composition. While these various and diverse elements are generally well connected, the relationship between the portal and the minaret, and between the portal and the rest of the structure, is rather weak.

Also, a number of comments should be made concerning the monument and its relation to its surrounding urban fabric. As mentioned, the mosque occupies a whole city plot. On three of the four sides, there is an attempt to acknowledge the direction of the surrounding streets, and to reconcile the difference with the direction of Mecca through the insertion of triangular sections. However, it is on the fourth and main side, the western side, that there is no attempt to align the façade with the street. Here, the building is set back from the street, creating an open plaza which is interrupted only by stairs. Therefore, the relation of the structure to its immediate urban surroundings remain unsatisfactory.

Concerning those involved in the conception of this monument, they include the Ministry of Pilgrimage and Endowments which commissioned the mosque; the Binladen Organisation which carried out contracting works; and Concenter, the firm responsible for supervision.

Qubba Mosque

The following two mosques, those of Qubba and al-Qiblatayn, are both located in the city of Madina. Both mosques are of an historic importance. The Qubba mosque rests on the site where the Prophet Mohammad built the first mosque after his Hijra from Madina. The original mosque has long since disappeared as a result of the successive renovations and reconstructions to which it was subjected. As for the mosque replaced by the current one, it dates back to the early ninetieth century. However, even that structure had undergone a number of modifications, the last of which was in 1969.

When El-Wakil was commissioned to conceive a larger mosque, he initially attempted to incorporate the ninetieth century structure into his design. However, the client, or Ministry of Pilgrimage and Endowments eventually decided to pull down the older mosque, and to completely replace it with a new one. Structural problems, and the difficulty of air conditioning the old mosque were the reasons provided for this decision.

The mosque is located in the south-western part of Madina. The western and northern borders of the site will be occupied by the construction of a new network of roads. A pre-existing cemetery flanks part of its eastern side. In order to build the new mosque, surrounding properties were expropriated. As a result, the site now amounts to a total of about 13'500 sq m. Later on, and as construction was nearing completion, the properties located to the southern or *qibla* side of the mosque also have been expropriated, but this time by the Municipality of Madina. The houses on the site, some of which were of an historical value, were demolished, and plans have been made for the construction of a multipurpose complex. However, the site remains empty, and is currently used for parking.

The new mosque can hold up to five times the number of the earlier one. The complex consists of a rectangular prayer hall raised on a second storey platform. In turn, the prayer hall connects to a cluster consisting of residential areas, offices, ablution facilities, shops, and a library. The prayer hall itself is arranged around a central courtyard. A sizeable hall characterised by six large domes resting on clustered columns flanks the courtyard on the south. A portico, which is two bays in depth, borders the courtyard on the east and west, while a one-bayed portico borders it on the north, and separates it form the women's prayer area. The women's prayer area, which is surrounded by a screen, is divided into two parts as a passageway connects the northern entrance with the courtyard. Six additional entrances are dispersed on the northern, eastern and western façades.

In terms of formal composition, the mosque is characterised by six large domes covering the main prayer area. The dome in front of the *mihrab* is differentiated from the others by its greater height. The remaining parts of the prayer hall are covered by fifty six smaller domes. Four minarets mark the corners of the prayer hall. These minarets rest on square bases, have octagonal shafts which take on a circular shape as they reach the top. Also, the minarets are accentuated by two balconies resting on *muqarnas* vaults.

As with the other mosques, this one is characterised by a variety of expensive finishes. Granite is utilised for flooring, for covering the piers of the prayer hall, as well as parts of the outer and inner walls. Also, marble and granite are used to create the patterned floor of the courtyard. A variety of other materials including brass, wood, and bronze are utilised in different parts of the mosque. In contrast with the other mosques designed by El-Wakil, this one utilises colour as is shown in the decorative panels attached to the pendentives of some of the domes.
Construction on this mosque was begun in 1984 and was completed two years later in 1986. Total costs amounted to SR 110'000'000 or SR 8'011/sq m (US$ 2'100). An agreement has been made with the Binladen Organisation, which was responsible for building the mosque, to assume maintenance responsibilities for an annual sum of SR 2'000'000.

Ruwais Mosque, Jeddah, Saudi Arabia

Because of its historic importance, this is a building which will always experience heavy use. However, it is during the Hajj season, when an estimated two million Muslims visit Madina, that the largest number of people will frequent the structure. While the existence of shops and a library allows the complex to take on additional functions, its importance essentially remains as a place for the performance of prayers.

When visited in April, climatic control for this structure seemed quite adequate. Of the mosques evaluated in this report, this one is the most susceptible to heating and cooling problems since the main prayer area is totally open onto the courtyard flanking it on the north. However, and at the same time, this mosque utilises a number of technologically innovative features. These include a retractable tent structure which is used to cover the courtyard on hot days, specially around noon time. Also, fans are placed inside some of the large chandeliers of the prayer hall. Another innovative feature in the context of mosque design is the incorporation of a ramp intended to serve the elderly and the handicapped. This ramp connects the street level with that of the prayer hall.

Because of this mosque's historic importance, it is well maintained. There are minor maintenance and ageing problems, for example pigeons constantly enter the prayer hall, leaving marks indicating their presence inside it. Also, some of the granite panels already show signs of deterioration at the edges.

This is the largest mosque considered in this report. Architecturally, it utilises a Mamluk revivalist vocabulary, as well as elements from the architecture of the Egyptian countryside. Also, there is an obvious attempt at incorporating some of the architectural features of the pre-existing ninetieth century mosque. This is evident in the design of the minarets as well as the entry portals. Still, the patron's decision to tear down the pre-existing mosque is regrettable, and could have been avoided. Also, while the mosque's utilisation of the retractable tent reflects an innovative use of technology, visually, these features do not blend well with the traditional appearance of the mosque's architecture.

Another weakness expressed in the design of this mosque is the lack of a clear relationship between the complex and the surrounding urban fabric. Therefore, and instead of attempting to relate to the surroundings, the mosque is placed within an open plaza which uncomfortably collides with the bordering pavement and streets. Still, most of the individual architectural elements of the mosque are designed with great care and express a high level of visual refinement.

Concerning those responsible for the realisation of this mosque, they include the patron, the Ministry of Pilgrimage and Endowments. Contracting work was carried out by the Binladen Organisation, and Concenter was responsible for supervision.

Qiblatayn Mosque

As with the Qubba Mosque, this one also is of an historic importance. Tradition holds that it is while praying in this mosque that the prophet Mohammad received divine orders to change the direction of prayer from Jerusalem to Mecca. Up to the 1980's, the site was occupied by a mosque dating back to the 1950's. It was the intention of the Ministry of Pilgrimage and Endowments to replace it with a larger one, and El-Wakil was commissioned to design the new mosque. construction was begun during the end of 1986, to be completed about two years later.

The current mosque is located on an irregular, and almost triangular site, located on the outskirts of the city and covering an area of about 4'000 sq m. The site is mainly flat, but is characterised by an upward slope towards its eastern side. It is bordered by a large street from the north and a cemetery from the west. A residential area used to flank the mosque's *qibla* side. However, the area was purchased by the Municipality of Madina, and its structures were demolished. While there are future plans to build a multipurpose complex on this recently acquired area, for the time being, it has been paved and is currently used as a parking lot.

The structures of this complex cover most of the site. The mosque itself is raised on a second storey platform, while storage areas, ablution facilities and mechanical rooms occupy the lower level. As for the prayer hall, it is also divided into two levels. The men's prayer area is located on the ground level, while the women's prayer area and a number of classrooms are found on the gallery above. Residential units are situated to the west of the prayer hall.

The design of the Qiblatayn Mosque incorporates a number of interesting features. These include the use of a wide staircase positioned parallel to the street. The staircase leads to a terrace from which a change of direction needs to be made in order to enter the prayer hall. This terrace, in addition to leading to the prayer hall, also looks onto a tree planted courtyard. Opposite the terrace, and to the western side of the courtyard, is a pavilion consisting of three domed bays. As for the eastern side of the site, it is marked by a small domed pavilion originally intended to hold a drinking fountain.

Concerning the exterior composition of the structure, its central part is framed by two elaborately shaped minarets. The area between these minarets is marked by two domes arranged along the *qibla* axis. The dome in front of the *mihrab* is the higher of the two. The incorporation of two domes is intended to symbolically allude to the two *qiblas*. The remaining parts of the prayer hall are covered with pointed barrel vaults. As a result of the site's relatively small size, it only contains a limited number of open areas. These include the small courtyard situated in front of the prayer hall, as well as the small plaza located on the eastern edge of the site.

As in the other mosques, there is a heavy reliance on brick construction. The use of brick even extends to include the platform of the outer terrace located to the north of the prayer hall. Instead of utilising reinforced concrete, this terrace rests on a network of brick cross vaults. Concerning finishes, a variety of materials are utilised, including granite of differing degrees of smoothness.

The mosque was completed towards the end of 1987. Total cost amounts to SR 30'000'000 or SR 7'138/sq m (US$ 1'928/sq m). In the brochure published commemorating the construction of this mosque, it is mentioned that while the structure was commissioned by the Ministry of Pilgrimage and Endowments, it was financed from the personal funds of King Fahd ibn Abd al-Aziz.

As with the *Qubba* Mosque, this mosque is of an historic importance, and therefore is visited constantly by worshippers, specially during the Hajj season. On a functional level, it is well planned, and there is a clear separation between its various functional zones such as the men's prayer area, the women's prayer area, and the residential units. As with a number of other mosques, vendors display their merchandise in front of the prayer area. However, and instead of simply utilising the pavement, the wide front staircase is also used. The mosque was intended to incorporate a *sabil* in the small domed structure to the east of the site. However, no foundation was installed there. Instead, a number of water coolers have been placed in the small courtyard.

On account of its historic and religious importance, this mosque is well maintained. As is the case with the other congregational mosques considered in this report, maintenance is carried out by the contractor, the Binladen Organisation. Of course, there are some minor ageing and maintenance problems. As with the Qubba Mosque, pigeons constantly enter the mosque, leaving physical marks indicating their presence, specially on the window sills. Also, the effect of rain and wind have made parts of the structure's exterior white surfaces brownish.

As with the Aziziah Mosque, the walls located on the eastern part of the mosque show soccer ball marks caused by children playing against that wall. Still, and all in all, the mosque is well maintained.

Architecturally, this is the most successful urban mosque designed by El-Wakil. This is evident from the manner in which the front façade acknowledges the direction of the adjacent street, and from the use of the wide staircase and terrace as transitional elements leading from that street to the prayer hall. Also, the direction of the *qibla* is indicated to those approaching the front entrance of the complex through the subtly planned intersection of the prayer hall and the exterior northern façade. Another successful feature is the insertion of a passageway between the complex and the adjacent cemetery.

The passageway, which connects the front and back sides of the complex, provides for an interesting spatial arrangement and is pleasant to walk through. The mosque is characterised by a variety of entry sequences through which one passes from lit to shaded areas.

As with the two earlier congregational mosques, this one was commissioned by the Ministry of Pilgrimage and Religious Endowments. Construction was carried out by the Binladen Organisation, while Concenter was responsible for supervision.

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