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.

Mohammad Al-Asad
Cambridge, 19 May 1989