



by Omar Hallaj

Pearl Mosque

Lahore, Pakistan



Architects

Arcop Associates: Ramesh Khosla, Yawar Jilani and Mahboob Khan

Client

Pakistan Services Limited

Design

1990

Completed

1992

I. Introduction

The Pearl Mosque in Lahore, completed in 1991, is located at the rear of a large hotel complex. It is intended for use by the hotel staff and guests. Its programme consists of a simple prayer room, ablution facilities, temporary imam quarters, a small library for religious texts, and restrooms. Its basement serves as a water tank for the hotel.

A balance between the transient International Style required by the hotel programme and the local architectural heritage was a main objective for the designers. This balance was achieved by drawing on the subtle references to geometric proportions in massing and spatial sequences that are common to late Mughal architecture as well as International Style modernism.

II. Contextual Information

a. *Historical background*

The city of Lahore is an ancient urban centre. It was one of the major cities of the Mughals in the 17th century. Its location as an important crossroads in the northern Punjab brought riches as well as invading armies. As a result the city cultivated a rich architectural heritage that reflects the political fortunes of its conquerors. The modern city of Lahore, however, is organised along a pattern set mostly by the British during their approximately one hundred years of colonial rule over the Indian sub-continent.

Today Lahore has almost seven million inhabitants plus innumerable migrant workers from the surrounding small villages. Its precarious location between the Ravi River to the West and North and the Indian border to the east forced the city to grow mostly southward. The city's reputation as a major cultural and educational centre can hardly account for the 4.5% growth rate at which it has been growing. Industry and commerce are taking over the city.

b. *Local architectural character*

Traditionally Lahore cultivated large suburban gardens and garden palaces around which small urban villages sporadically grew. Today, particularly along the main axis of the city, this low-density urbanisation is still evident. Gardens and green areas separate the built-up areas from the main streets. However, in the areas left between the streets temporary neighbourhoods grew. These mostly squatter settlements, known as *katchi abadi*, became permanent fixtures of the city. Therefore, it is very typical to see low-income pockets appear adjacent to the highest-valued real estate.

The Mughal presence in the city has left strong stylistic imprints. However, the Mughal influence is complex. Early Mughal architecture used brick and polychromatic materials, whereas late-Mughal works used plain white marble. In both cases the architecture of that culture maintained a critical balance between the massive structure and the light and transparent screen partitions. Axiality and symmetry are two very important organising factors.

Later Sikh presence in the city created a series of colourful and ornate temples. The British used both Mughal and Sikh motifs on the façades of important state buildings, but they invariably used floor plans that were alien to the local architecture and reflected the British bureaucratic concerns of the time. The postcolonial period witnessed two main streams of architecture. The first was International Style architecture, heavily influenced by the work of Le Corbusier and then by the brutalist style of the 1960s. The second continued the colonial tradition of mixing modern planning concerns with orientalist façades.

The city also developed rich vernacular traditions that tried to replicate certain local motifs using modern building materials. The result is a hybrid texture with no one particular, prevalent style but rather a mixture of mannerist and eclectic effects. The latest fads of post-modernism are but the last introduction into the arena.

c. *Climatic conditions*

Lahore is generally hot and dry. The winters are short with temperatures rarely below freezing. Fall and spring are short and summer is generally very hot and long, with temperatures in the 40s °C (110 °F). The dry climate is offset by the many canals in the area. Water is drawn to the Ravi River (whose sources were blocked by India) from a northern river. A main canal also draws the water from the South through the city. The water used to irrigate the gardens also adds moisture to the air.

Until British rule, the buildings of Lahore were traditionally open to the exterior and the idea of enclosing public buildings was uncommon. The British soon realised that their classical buildings needed shade elements.

d. *Site context*

The Pearl Mosque is part of the expansion of an old hotel in Lahore. The Pearl Continental complex is located on the old Mall Road of Lahore, now known as the Shahrah Quaid-e-Azam, after Pakistan's founding father. The Mall was laid during the colonial period to connect the city centre with the military cantonment to the southeast. One end of the Mall is commercial, dotted with large, brick state buildings with a hybrid mix of 19th century British Neo-Gothic and the local Mughal traditions. The other end, further from the city centre, is loosely built-up and characteristic of the grand boulevard tradition of the last century.

Though its original layout was mostly suburban, with important governmental buildings, statesmen's residences, and gardens, the street is now centrally located. It is used as a major thoroughfare on the way to the city centre, yet it still preserves a ceremonious character. City residents stroll up and down the Mall on summer evenings and holidays, as some of the most popular open-air facilities are located along this stretch.

The Pearl Mosque, at the rear of the hotel complex, is accessible only from the Mall Road. The plots on either side of the hotel complex along the Mall are used by government officials for residences and ceremonial offices. The back neighbourhood street is blocked off and a broken-glass-topped wall marks the boundaries of the site. A narrow street runs parallel to the back wall. Only residential plots are adjacent to the complex in the area surrounding the mosque.

The old hotel was six stories high and stood parallel to the Mall Road. It was built by a foreign architect in the 1960s with an unmistakably International Style character. The new expansion was added perpendicular to the old part to extend deep into the back of the site. The two wings of the hotel are connected by a large atrium.

The mosque occupies the western rear corner of the site, across from the rear of the new wing. Separated from the main complex by a hold-out plot, the square-shaped structure is loosely fitted within a trapezoidal-shaped protrusion into the adjacent neighbourhood. Therefore, it is surrounded on three sides by an old residential "temporary settlement." Like many of Lahore's squatter areas, this neighbourhood has become a permanent establishment. The mosque is separated from the adjacent property line by a small garden that varies between 8–12 feet (3–4 m) wide. The garden is lined with pebbles and crudely planted with trees and flower basins.

The mosque is hardly visible from any public vantage point except at a very narrow angle from the

back street. Indeed, very few people in the area seem to know about its existence. The neighbourhood in the back has two small mosques of its own.

Within the 15-acre complex, the mosque can be accessed either by going through the entrance hotel lobby into the shopping arcade and out of the rear entrance or by going around the hotel. This latter is planned to be the main entrance to the shopping arcade. Vehicles will be able to drop off shoppers at that entrance. The mosque entrance faces this drop-off point. This section of the project has not yet been built and temporary landscaping exists at the moment.

A power plant and a bicycle shed are also in the back of the complex. The power plant houses four generators of 3-megawatt power. The hotel employees use the shed to park their bikes. The shed is a temporary corrugated metal structure, and the plant is treated with the same architectural vocabulary as the mosque. The mosque stands apart because of its protrusion into the neighbourhood.

Entrance to the mosque is made at a 45° angle to the square-shaped building. This diagonal access to the prayer hall directs the users of the space immediately toward Mecca upon entering.

e. Site topography

The city of Lahore is mostly flat terrain. The hotel complex is no exception.

III. Programme

a. Conditions of programme formulation

Before the addition, a small old mosque stood on the site. This mosque was closer to the street, but it was evident that it would not meet the needs created by the new addition. It had been built on the sewer line and water leakage had caused some structural damage. It also stood in the way of the new expansion scheme.

Removing a mosque is not an easy task. An alternative was immediately needed. This might explain why the new mosque was the first part of the planned additions to be built. It was already in use in 1992 before the construction of the new hotel wing was finished. The site of the old mosque was recognised symbolically in the new wing by a large pool of water made of black stone and set in the middle of the dining facilities. Some hotels in Pakistan have had problems with the location of the mosque on their premises, or at least with the architectural character of the mosque being different from the corporate image of the hotel. The Marriott in Karachi, which is owned by the same client, has had a previous history regarding the location and style of the mosque. At the Pearl Continental in Lahore this problem seems to have been resolved amicably.

b. Objectives

The new mosque was designed to accommodate a maximum of 450–500 worshippers who were thought to be mostly hotel staff and guests. The hotel employs some 800 people and has 500 rooms. As the hotel contains reception halls that could be rented out for wedding celebrations, the mosque could also be used for part of the ceremonies.

The hotel management feared that a permanent preacher might align the mosque with a certain sectarian background. Therefore, no permanent clergy was sought; and no permanent quarters for the imam were required.

The owner left the architectural expression of the building up to the architect and was exceptionally

receptive to the idea of breaking away from the traditional mosque semiotics (the minaret, the dome, and the *minbar*).

c. *Functional requirements*

The programme required a prayer hall for 475 people, an ablution area, restrooms, a small library to store copies of the Holy Qur'an, and a small room for the imam. The imam room could be small as the imam was not expected to be present except for the Friday prayer. Today, the library and the imam rooms are being used as storage for the prayer rugs. Items needed for the rituals (copies of the Holy Qur'an and prayer hats) are stored inside the prayer hall.

The daily expected attendance at the mosque was thought to be about 100 worshippers. A special area was planned for the daily prayers that involved highlighting a small square area in front of the *mihrab* with light construction. This part of the mosque is still not built, although the management intends to build it as soon as funds are available.

The structure of the mosque covers the water storage tanks and the pumping station for the hotel. The walls of the underground tank were used as foundations for the mosque, thus access to the roof, underground pump room, and water tanks was needed.

IV. Description

a. *Project data*

The mass of the building is very simple: a square volume with each side equivalent to about four times its height, with two small towers located at diagonally opposite corners. The two front sides of the square are carved out to create an arcade.

The building is square in plan with each side measuring 88 feet (26.75 m). The height of the main volume is 24 feet (7.3 m). To the northwest and the southeast, two small towers rise only 14 feet (4.25 m) above the structure and barely resemble minarets. Indeed the closest architectural reference for these two elements are the *malqaf* (air scoop towers). The towers protrude slightly in plan from the mass of the building, which gives them a vertical expression beyond their actual height.

The arcade on the north and east sides of the building acts as a buffer between the square plan of the prayer hall and the main grounds of the hotel. An open portico at the northeast corner of the arcade leads diagonally to the prayer hall. The north extension of the arcade around the prayer hall conceals the ablution area and the restrooms. The ablution area is accessed from the entrance portico, while the restrooms are accessed from the rear through a door in the tower. The east side arcade conceals the imam and library rooms, as well as the staircase leading to the roof and the pump room in the basement. The door to the stairs is located in the other tower.

The square prayer hall is the largest part of the building, measuring 67.5 feet (21 m) on each side. It is accessed only through the entrance portico. The prayer hall is the same height as the rest of the building. There was no attempt to make a dome.

The auxiliary functions of ablution, restrooms, imam, and library rooms are concealed by a concrete block screen wall. The screen wall is placed between the columns of the arcade and does not disturb the rhythm of the arcade.

b. *Evolution of design concepts*

The old hotel was designed in the International Style typical of the early 1960s by the New York firm of William Tabler and Associates. The architects of the new addition and the mosque decided to keep the modern language of the old hotel, yet give the new additions a flavour of the traditional Mughal heritage.

A master plan was developed for the complex, and it was decided that to allow for the removal of the old mosque, the new mosque would be the first structure built. The question of the architectural language was still unresolved when the mosque was designed. In many ways, the mosque proved to be the testing ground for resolution of this question.

It was decided that the link with traditional Mughal architecture would operate on the level of geometry, proportion, and massing. The basic square was adopted as a pure geometric form. However, instead of aligning the main axis of the building in the direction of Mecca, the diagonal of the square marks that direction. This shift in orientation from traditional mosque design is very powerful; it is further reinforced by the placement of a solid wall at the back corner. The light coming from behind the wall creates an abstraction of the idea of *mihrab* without directly imitating that element.

Furthermore, the proportion of the individual prayer rug was taken as a module for the building. The pattern of the individual rugs was paved in slightly darker bands of marble layered through the light flooring. Traditional prayer rugs were thought to have a 1:2 ratio. Many Mughal mosques in Lahore have a modular rug pattern paved into the floor, though the 1:2 ratio is not necessarily typical.

The 45° rotation of the floor pattern and the 1:2 ratio of the prayer rug created a rigid yet simple system of proportioning in the building. This proportioning system was carried into the elevations. The architects devised a concrete block screen wall system. This system is particularly reminiscent of the Mughal screen walls known locally as *jali* screens. From the beginning the architects intended to use the *jali*, but its detailed design was developed in the mosque and later carried out in the rest of the hotel complex. The *jali* work is developed using a modular concrete masonry unit. The units were specially designed using a 1:2 ratio. Some were hollow, others were partially recessed but not open on both sides, and a few hollowed out using the geometric Kufic script to carve out the name of Allah.

Each screen wall is square in shape. Simple white pillars separate the screen segments. Each square wall segment is divided into three vertical strips and each strip is divided into two parts. The top is square while the bottom is rectangular and has a proportion of 1:2. Within each part, the concrete masonry units (CMU) are layered horizontally. A vertical course of CMU laid at a 45° angle tops the *jali* composition to reinforce the geometry of the square.

The rigorous use of the 1:2 ratio along the 45° angle creates many of the typical square root of 2 problems and secondary-geometry concerns. It does not seem that the architects were concerned about dealing with these issues any further.

The building uses extremely simple modern elements. No attempt at traditional ornamentation was intended. The mosque had to maintain the modernist look of the original hotel. Yet, there are many traditional aspects in this mosque. The use of geometry is the most immediate.

The other traditional aspect of this building is its openness. The *jali* work allows for a complete open feel to the building and enables the mosque to go without artificial air-conditioning. The use of the *jali* creates enough cross currents in the summer to keep the place relatively cool. In the winter, the low sun passes through the screens deep into the space to alleviate the mild winter temperatures. The traditional Mughal screens of course were much finer and were proportioned to break the light in a

more even manner.

Another similarity with the traditional architecture is the close resemblance of the mosque to the pavilion architecture prevalent in Mughal days. An arcade that is part of the mass of the building fronts the mosque. Many of the pavilions built in the Lahore Fort use this sequence of arcades as their planning principles.

Painting the mosque white helps to cross the modernist / traditional dichotomy. The original hotel is white due to modernist convictions, and the majority of late Mughal buildings are white due to a passion for expensive marble. The mosque's white paint is another element that bridges both modern and traditional architectural languages.

Unlike traditional Mughal architecture the mosque does not form an organising element in the surrounding landscape. The irregular trapezoidal shape of the enclave of the mosque was not addressed. Pebble stone and temporary planters were placed in the open space that separates the mosque from the hotel extension, but this space is not clearly defined. This is partially due to the fact that the master plan has not yet been fully undertaken. However, even according to the master plan the mosque will not have a strong formal relation to the rear drop-off point for the hotel. Indeed, it seems that the primary driving force behind the design of the mosque is internal to its function, form, and geometry, while external concerns were dealt with mostly as residual factors.

c. *Structure, Materials, Technology*

The basic structural system of the mosque is a cast-in-place reinforced concrete post and beam frame with an exposed waffle concrete slab ceiling over the main hall. The concrete masonry *jali* work is used in various patterns as an infill screen wall. All exposed elements are painted white. Terrazzo flooring is used throughout the building. Marble strips were used to create prayer rug patterns on the floor of the main hall and simple geometric patterns on the floor of the entrance portico. The roof is well insulated with bituminous waterproofing.

The mosque sits over the water storage tanks of the hotel. The storage tanks are constructed with massive cast-in-place concrete. The pumping room underneath the mosque is finished in exposed concrete.

Electrical wiring is very simple. Simple light fixtures are used in the mosque. The three chandeliers planned for the entrance portico have not yet been installed due to budgetary constraints. Spotlights placed in sheltered white concrete boxes are used to light the exterior front elevations of the mosque at night. The mosque does not use external loudspeakers. A low decibel amplification system is used during Friday sermons.

All building materials and technologies are widely used in Lahore. The mosque construction is in stark contrast to that of the hotel, which used some very expensive materials and technologies, some of which were imported.

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

The labour force was provided by a labour contract. The owner had an in-house technical department that managed the construction process. The labour was mostly from Pakistan, though a large number came from areas other than Lahore.

The consultants are based in Karachi. They are a subsidiary of a firm based in Montreal. The basic conceptual work for the project was developed in Karachi and design development was done in Montreal. Working drawings were done in Karachi. The principal consultants visited the site regularly

during all phases of the work.

V. Construction Schedule and Costs

a. *History of project*

Project Commission:	July 1990
Design Phase:	October 1990–December 1990
Construction:	January 1991–December 1991
Project Occupancy:	January 1992

b. *Total costs and main sources of financing*

The total cost of the mosque is PKR 6'971'000 (USD 224'885).
Per square metre this amounts to USD 155

c. *Comparative costs*

Several other aspects of this mosque are still scheduled to be done in the future, but their cost will remain minimal. The construction rates are equivalent to the costs of average moderate-income housing projects in the area.

d. *Qualitative analysis of costs*

The owner provided all the funds needed for the project.

e. *Maintenance costs*

The owner covers maintenance costs. A five-member committee composed of both management and staff oversees the day-to-day maintenance requirements. The only major maintenance during the project lifetime was a new paint job. The hotel generates its own power, therefore it is hard to assess the electrical costs of operation. Yet, because no heating or air-conditioning is required, the use of energy in the building is minimal.

VI. Technical Assessment

a. *Functional assessment*

The mosque building is a very simple building that adequately serves as a prayer space for the hotel staff and guests. Its openness to the elements works superbly with the climatic conditions of Lahore. Its use of materials requires minimum maintenance and the building's seven years of use did not bring to light any major maintenance problems.

b. *Climatic performance*

Rain spouts inlaid within the basic structure have performed well, as the building is generally well looked after, and the roof is easily accessible for maintenance.

c. *Choice of materials, level of technology*

The only problem with the natural lighting seems to occur on winter afternoons, when the sun

penetrates deeply into the space and creates glare problems as the worshippers face the southwesterly direction of Mecca. Otherwise, the prayer hall maintains an adequate 5% daylight factor evenly distributed throughout the space.

d. *Ageing and maintenance*

As the drop-off point at the rear of the hotel is not yet constructed it is hard to assess the way the mosque will relate to the hotel complex in the end. As it stands the building provides an intermediary scale between the hotel mass and the *katchi abadi* houses immediately adjacent to the site. Its location in the back of the site is not cumbersome for the staff of the hotel, though the guests have little indication as to how to reach the mosque without asking.

e. *Design features*

The building reflects an unmistakable mosque character despite its very simple look and the lack of classical minarets and dome. However, the repetition of the *jali* work in an almost identical way in the power plant creates an element of confusion. The only way to differentiate the two without going into the buildings is the Kufic inscription of the name of Allah on some of the *jali* courses in the mosque.

VII. Users

a. *Beneficiaries of the programme*

The majority of the users of the mosque are the hotel staff. Guests seem to use the mosque only during conventions that have a religious character. The users are all men. The mosque does not provide for a separate area for women, nor is the local tradition very accommodating to women's use of mosques for worshipping.

The people of the neighbourhood seem to be unaware of its existence altogether. They worship at the two small mosques located in their area. The strict security requirements make the wandering of unknown worshippers into the back of the complex rather difficult. Broken glass marks the boundary with the neighbourhood.

The users of the mosque are perfectly at ease in the mosque. Worshippers frequent the mosque as their schedules allow. During the Friday prayer the mosque gets filled up. People stay in the building only long enough to perform their prayers.

The use of decorative paraphernalia is limited. The committee responsible for running the mosque had to make many compromises. The management wanted to keep the mosque as neutral as possible (to avoid any references for sectarian affiliation) and the staff wanted to use intimate and familiar imagery. Several Qur'anic verses and some decorative panels were added to the interior in a manner that satisfied both sides.

Any further attempt at evaluating the response of the users will remain speculative.

VIII. Persons involved

Project personnel

- Architects: ARCOP Associates, represented by its principles:
Ramesh Khosla, Yawar Jilani and Mahboob Khan.

- Owner: Pakistan Services Limited represented by its general manager:
 - Structural Engineer: Mushtaq Dawood and Najam Bilal
 - Plumbing Engineer: Anwar Saddat
 - Electrical Engineer: Mohammed Ayub
 - Site Engineer: Wazir Sharif
 - Job Captain: Burjor Rustomjee

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