I. OBJECTIVES

To provide hospital facilities for 300 beds (150 for medical treatment and 150 for surgery). The proposed facility is conceived as a central hospital for the southern military region of Morocco.

II. DESCRIPTION OF SITE

A. Topography and Surroundings

Located within a military district at the edge of the residential area of west Marrakech, the site is a flat plain, with a visual boundary to the north formed by the steep mount of "Guéliz".

B. Historical Background

Although the original plan and foundations for the medical hospital were set out in 1935, no construction was actually undertaken previous to the current project. The surrounding area has undergone marked change in the interim. Residential as well as institutional buildings spread all around, yet the original character of the land is maintained and attested to by the remains of traditional palm tree groves.
C. Local Architectural Character

The architecture of the immediate surroundings is typical of new Marrakech. Two to three-storey buildings are manifold; some are residential and many are institutional and all have the traditional red coloured walls of Marrakech, originally imposed by colonial law, and later maintained and even appreciated, after independence. Stone, masonry and reinforced concrete are used throughout the area. Yet, adherence to local character is expressed in a variety of ways, ranging from orthodox imitation of traditional forms to playful, post-modernist interpretations.

D. Access

The site is directly accessible from El-Mougama Street, a main thoroughfare linking the site to the center of Marrakech, some 500 meters to the east. Emergency access is planned from an extension of the Avenue de France, another main street linking the site to the southern district of the city and, as well, to the south of Morocco. An internal ring road serves as an access road.

E. Elements of the Site

The hospital complex consists of the following elements:

1) The main building, which houses the hospital and the outpatient clinic, administration, and medical and service facilities. The hospital building is located along a north-south axis facing the main gate.

2) A residential complex for interns, with facilities for lectures, seminars and conferences, is located on the southeast corner of the site.

3) A housing complex for staff lies on the southwest corner.

4) A natural therapy building is located near the far east side of the hospital building.

5) The morgue is immediately to the east of the hospital.

6) A small mosque is located to the west of the hospital.
7) A social club and private villas for the chief physician and senior staff are to the north of the hospital.

III. DESIGN AND CONSTRUCTION

A. Architect's Brief

A program statement from the client defined the size and the nature of the hospital as a central facility for military patients and their families with a capacity of 300 beds in total (150 for medical treatment and 150 for surgery). The foundations for an earlier plan were already laid and had to be considered.

The architect chose to respect the existing foundation and to redefine the program along three main directives:

1) **Culturally**
   by raising questions about the nature of illness and its treatment in the context of Moroccan cultures.

2) **Organizationally**
   By articulating the elements and relationships which can be arranged functionally, and those which must be considered culturally.

3) **Symbolically**
   By searching a model for the expression of the above relations, both functionally and culturally.

The architect proposed to look at the hospital as a community rather than as a factory or laboratory, favouring culture as a measure of the success of the hospital, rather than the conventional model of efficiency.

The idea of the hospital as a community was articulated in two ways, both drawn from the architect's perception of traditional Moroccan life.
First, a series of internal gardens (Riyadhs) are used to organize the basic elements of the hospital. Each is shaped according to its location in the plan and according to the nature of the elements it organizes.

Second, low-rise compartments, each like a cluster of buildings, formed the spaces for the different facilities of the hospital.

Stated by the architect, the intended environment of the community-like hospital would be more conducive to the cultural attitudes of Moroccans toward illness and its treatment.

B. Evolution of Design Concepts

A conceptual framework was developed and presented to the client in the form of a series of illustrations, each outlining a fundamental question about the nature of the hospital and illustrating different options to attempt an answer. No significant response was obtained from the client.

Preliminary designs were carried out without the use of the more typical large number of consultants; the result was a fairly unconventional scheme which was approved by the client.

Final designs were carried out in coordination with various hospital consultants.

1) Response to Physical Constraints

The only physical constraint were the existing foundations which defined the location and the orientation of the main hospital building. The elements and the organization of the different facilities were developed accordingly, with necessary adjustments to fit the existing foundations.

Response to User Requirements and Spatial Organization

a) The Outpatient Clinic organized around an internal garden, the entrance to the clinic is formed through a
Saha (traditional plaza) planted with orange trees and furnished with fountains; the reception and registration spaces are open to the shaded and cool arcades around the courtyard through stained glass doors and windows. The waiting and examination spaces are each functionally organized in pairs of two groups and the courtyard itself remains free of any technical activities and receptive to the outpatients by its rich variety of symbolic references.

b) The Hospital consists of three-storey clusters of bed houses and other medical facilities around two main courtyards form the body of the hospital facility. Long and somehow dark corridors result from this arrangement.

c) X-Ray and Laboratories are located in relation to the outpatient clinic through two courtyards and a central transfer and registration station. Laboratories and pharmacies form two extended fingers to the east of the X-Ray courtyard.

d) The Operating Rooms are located above the X-Ray facility and linked directly to the hospital and indirectly to the outpatients clinic. Sterilization and intensive care units are directly related to the operating rooms and enjoy view to the courtyard.

e) The Visitors Entrance was originally planned between the hospital and the outpatient clinic and is now used as a VIP entrance, forcing visitors to pass through the outpatient clinic in order to reach the hospital section.

f) The Emergency Room is at the rear of the hospital, forming a sort of small hospital in itself, complete with operating room and a few beds.

g) The Service-yard and the Central Kitchen, and laundry, storage, and workshops are located around a service yard
about 2.5 meters below grade, minimizing the visual impact of these elements. The service yard is located on the northwesternmost edge of the hospital building, requiring a lengthy service route to and from the kitchen and the other services.

h) Physical Therapy is located outside the hospital, to the east of the building, in an independent facility.

i) The Morgue is outside the hospital building immediately, to the east of the operating room, with direct access to the service road.

j) The Mosque, a small prayer-mosque, added to the program in a later stage of the design, was conceived as a prayer place for the staff and the patients. The Mosque is located to the west of the hospital building in an axial relationship with the visitors' entrance. It is approached through a walled courtyard (Sahn) with an ablutions fountain in the middle. An open iwan forms the direction towards the prayer place. The prayer place itself is a square space with a small cupola in the middle, raised by four groups of columns, each group forming a strong "L"-shaped corner of the square plan of the cupola. The Kibla wall is behind the central space arrangement and is made obscure by the columns. The sense of space is more centralised rather than the directional and linear space needed for prayer.

k) Residence for the Interns, a complex containing small appartments, each comprising two bedrooms, and a kitchen with communal facilities, cafeteria, lounge and an auditorium, is located in the southeast corner of the site.

l) Staff Housing, a similar complex is located in the southwest corner of the site to house physicians and
m) Private Villas, several private villas are located along the northern edge of the site to house senior physicians, directors and high-ranking visitors.

n) The Club, a social and sports club is located on the north edge of the site, including a swimming pool, a lounge, a cafeteria and a restaurant for the staff.

3) Formal Aspects

The hospital building is an exercise in a conscious and meticulous formal design:

a) Courtyards

Courtyards form the focus around which the elements of the hospital are arranged. Two formal aspects are observed throughout this organization:

i. Each courtyard is organized around a center or number of centers, usually points of water or vegetation.

ii. The courtyard, then organizes the spaces around it via a series of axes, generating patterns of and movements and coordinating the different elements around. This is more true in the case of the clinic than in other parts of the hospital.

b) Familiar Elements

The formality of this axial arrangement is manipulated and in many instances undermined by introducing a series of familiar elements in a rather unfamiliar way. For instance, the orange grove at the entrance breaks the axially of the gate-way to the hospital and forms a wandering route towards the entrance of the outpatients clinic.
c) **Arcades**

Arches and arcades are used to define entrances and to emphasize movement along the edges of courtyards. Though not structural, the use of arches and arcades evokes a sense of traditional space and increases the intimacy of the hospital.

d) **Openings**

The expression of the building is attained through the careful handling of fenestration, massing, and composition. A typology of openings combines horizontal strip windows - characteristic of modern Moroccan architecture - with a variety of arched windows and arcaded entrances. The shape of the arch is derived from the stepped arches common to the architecture of Fez and Marrakech. Juxtaposition of the two types is often done with skill and elegance.

e) **Massing**

The hospital building and its related facilities are a work of skillful and impressive massing. A deliberate use of light in creating shade and shadow is made on two levels:

1st - a careful and somehow static play of masses through surface treatment, textures, colours, etc., is experienced on the visual level; and

2nd - a much more dynamic play of masses is experienced on the level of the building as a whole.

Manipulation of the connections between different parts of the building (staircases, water towers, etc.) is used to create a drama of expression, clearly felt from a distance. This treatment, especially on the roof-top, is becoming a trademark of the architect's work throughout
Marrakech.

f) Transparency and Transposition

A sensitive use of coloured glass windows and arched openings yields a sense of transparency, and at the same time transposes many layers of meaning and expression. This is clearly seen and felt in the entrance halls of the administration and the outpatient clinic.

g) Water-Stone Spectrum

From the center of the courtyards to the interior of the spaces around them, expression of material ranges from water to earth: planted surfaces, trees on the perimeter, then burned clay or brick and concrete and plastered walls in the interior spaces. This spectrum is beautifully handled in the clinic yard, in a manner reminiscent of the Alhambra Palace.

h) Juxtaposition

Traditional elements, such as arches, arcades, trees, and fountains, are used as a foreground for much more modern elements, creating an ambiance of time and culture, in which the movement of people and activities becomes an extremely rich and celebrated experience.

i) Unity

The hospital is a thoroughly formal design, in the best of modern traditions; yet, sensibility to traditional symbols and meanings as well as utilization of traditional crafts, gives the whole an expression of rich and culturally inclusive unity.
C. Structure and Materials

In-situ, reinforced concrete skeleton with brick infill. For the finishing, zellige tiles (mosaic), is used for certain surfaces and on some floors. Gypsum plaster and handcrafted ornaments are used, as well, on some walls.

Rocky stone, from the nearby mount 'Guéliz', was used to reinforce the existing foundations.

D. Origin of Technology

All building technology is local, utilizing both conventional construction technology (for the main structure of the hospital) and traditional craftsmanship (in the finishing and in all the work surrounding the courtyards).

All materials and the labor force are of local provenance.

Professionals, including the architect (a Tunisian-born, resident of Marrakech), the contractors and the craftsmen, are all local.

IV. CONSTRUCTION SCHEDULE

The design was completed in 1979, and took about a year.

Construction began in 1979 and was completed in 1982.

Total cost: 50,000,000 Dirhams or 5,000,000 US$.
Cost per square meter: 5,000 Dirhams or 500 US$.

No comparative cost was obtained. 500 US$ per square meter seems to be reasonable compared to the cost of clinic facilities built in Casablanca for 600-800 US$ per square meter in 1980.

Maintenance cost was not obtained.
V. TECHNICAL ASSESSMENT

A. Functional Assessment

This hospital seems to work quite well functionally as well as socially. The premise of the use of the courtyard as a "Riyadh" is working very well. However, some complaints were voiced by the staff, regarding:

1) The procedure of transferring a patient for hospitalization is confused by the location of the entrance and the Registration Section.
2) No fire or emergency exits were provided for the laboratories which was taken by the Chief Physician as a fatal problem.
3) Dark and long, stretching corridors in the hospital wings.
4) The emergency unit is removed from the core facilities of the X-Ray, laboratory and the main operation room.
5) The kitchen is not functioning well, partly due to its location and its internal organization.
6) The location of the morgue and the existence of deceased persons causes a serious psychological problem. Many patients in the middle wing and in other must observe the transport of corpses and thus experience the mourning of their families.
7) The mosque does not function well for prayer. The cupola space and the resulting centrality contradict with the linearity of prayer.
8) As a hospital mosque, it should have a relation to the morgue, so that the ritual prayer for the dead could be performed there.

B. Climatic, Lighting, Ventilation, etc.

The use of courtyards and the handling of openings have created a very pleasant environment, cool in the center and naturally lighted in most areas. The spaces are well ventilated and fit quite well with the climate of Marrakech.
C. Choice of Materials

The very skillful and rather artistic use of materials has resulted in a rich and unpretentious building. The tiles, used for flooring and for decoration, ornaments and stained glass all add to the quality of the environment. As stated before, the use of materials followed a scheme which combines natural materials and craft technology with industrial materials and advanced techniques.

D. Ageing and Maintenance

On a formal level, the materials used are durable and easily maintained, especially those used in the public spaces and the courtyards. However, a clear problem of maintenance is expressed by the staff with regard to the sanitation system and the kitchen, and other service facilities.

E. Design Features

The project is extremely successful in a formal sense, as expressed earlier in section B.2 of this report. The observation listed in that section regarding the formal qualities of the building can only be stressed again here.

The architect succeeded in shaping his spaces through the language of modern architecture, utilizing and integrating some profound patterns and ideas from traditional building.

The arrangements of the spaces of the hospital followed a clear rationale, made mature and very rich by the consideration of the cultural aspects of each activity and space.

VI. USERS

The hospital is used by military patients and their families of the southern region of Morocco, including Marrakech, and the southern desert. All ranks are admitted. The medical staff is entirely Moroccan, as are as the administrative and technical staff.
A variety of social and cultural backgrounds can be readily observed among the families.

VII. AESTHETIC ASSESSMENT

The architect succeeded in generating a military hospital which is truly beautiful. The formal articulation of the elements and the masses add a structure to the different traditional references used throughout the building. It is fair to suggest that the formal aspects of these traditional references overpowered their intended social impact.

For more concrete aesthetic assessment, please refer to Section III.3 of this report: "Formal Aspects".

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