

1986 TECHNICAL REVIEW SUMMARY

Dar Lamane Housing Complex
Casablanca, Morocco

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MOR.

Date of Completion: 1983 June

I. OBJECTIVES

To plan, develop and construct a residential community of some 4000 units, as well as the requisite facilities for low-income families on a reclaimed site in the industrial district of Casablanca, Morocco.

II. DESCRIPTION OF SITE

A. The site comprises 37 hectares of reclaimed land located in the midst of the industrial district of Casablanca, about 6 kms south of the center of the city.

B. Historical Background

The site was a stone quarry, exploited for many years by a national cement company and abandoned around 1935. Water overflow from a spring located on the site created a huge swamp, causing a great deal of pollution and illegal activities. The site was acquired by the client in 1979, reclaimed, and prepared for construction late in 1980.

C. Local Architectural Character

The site is surrounded by several types of housing. To the north are

4-5 storey apartment blocks for public housing, arranged on a strict gridiron pattern with no amenities, and without any variety of expression. Close by, a few hundred meters to the west, lies the bulk of the industrial residential community of El-Mohammady: 3-4 storey buildings, with some measure of cohesion and character, which seem to have resulted from a land subdivision scheme, somewhat regulated.

The complex is characterized by plain walls, standard rectangular windows and projecting balconies, all painted with yellowish color. Ground floors are all shops, workshops and very small industrial and repair shops. Community facilities like hammans, bakeries, etc., are well located and with clear expression.

Immediately surrounding the site from the east, south and west sides is a huge squatter settlement. Most constructions are shacks, with highly deteriorated public facilities, such as water fountains. There are no sewer systems or other services.

Fine examples of industrial buildings and large warehouses are common features of the local architecture.

Access

The site is accessible from the north west side via a main road which connects the district to the city of Casablanca and to the freeway. A loop road gives access to the center of the community, and a service road encircles it and is linked to the main and access roads. Pedestrian access follows the general pattern established by the urbanization and services. A main pedestrian route connects the site to the neighbouring squatter community where many services are provided, and to the north, where a secondary school is located.

III. DESIGN AND CONSTRUCTION

A. The Architect's Brief

The problem presented to the architect was a typical low-housing project, yet limitations of scale, time and budget added new

dimensions. Over 4000 units were to be designed and constructed in a period of less than 30 months. The client emphasized the necessity of providing the needed services and amenities, as well as the desire to relate the new community to the surroundings and to the general cultural characteristics of Morocco.

The architect saw the problem in its cultural context as a problem of defining a "Form" for the housing of low-income, urban residents. Originally from rural or nomadic backgrounds, neither public housing (restricted in form) nor informal housing (lacking structure and services) provided insight into this quest for "Form".

The planning and design approach was therefore based on two observations relevant to this intent:

1. Urban public space and the grouping of housing is more important to low-income groups than is the particular design solution for individual units.
2. Safety and security are more important qualities than possession and territoriality for newcomers to the city, especially those of rural or nomadic origin.

These two observations led to the concept of Dar Lamane (which means literally "Safe, or Secure Home"). The concept of the "Dar" (the traditional house for one or more families) was taken as a reference from which the architects drew a fairly elaborate scheme for the community, and for the form of individual housing.

B. Evolution of the Design Concept

A general scheme was developed on the bases of a hierarchy of public spaces and a redefinition of the housing form such that public spaces would be within the domain of housing, and that the form of the housing would respond to the cultural needs of the different population groups as well as to the specific needs and aspirations of different age and social groups, among them children, mothers, youngsters, women, the aged, etc.

1. Spatial Organization

The overall organization resembles, in structure, and differs, in form and expression, traditional Moroccan towns. This can be illustrated by examining the organization of public spaces, housing arrangements, and main networks:

a) The Central Space

A large, squared central space is located roughly in the geometrical center of the site and is reached from the main road via an access street. The mosque, markets, and festival hall are located along the north west corner, and the housing development surrounds the central space from the north, east and west sides. The space opens from its south edge to a vast sports field which acts as a barrier between the community and the neighbouring squatter settlements. The perimetres of the central space are formed by housing clusters, shops and markets, with five main gateways leading to market streets and to the rest of the community.

b) Housing Clusters (Dar)

Six groups of housing clusters (Dar) are arranged around the central space. The "Dar" is an arrangement of two rows of attached apartment buildings separated by a pedestrian street which gives access to all buildings and where bicycle parking, small gardens, etc., are located. Entrances are located to face each other and staircases are exposed. The apartment buildings form a rectangular plan with a central courtyard that is used as a communal

c) Gateway and Market Street (Suq)

Streets formed by each two adjacent clusters (Dars) are treated as market streets; arcaded side walks form a variety of shops, cafés and spaces for vendors.

d) Housing Streets

On the periphery of the site, housing is provided in an arrangement of wandering, linear streets, each formed by two parallel rows of attached-apartment buildings: between them is a pedestrian street similar to that of the housing cluster. Housing streets are linked to the central space by the five market streets.

e) Service Yards

Housing streets are organized around service yards accessible by car and serving a group of shops and bakeries, a hamman, and sometimes a nursing school.

f) Housing Units

Housing units are either 3 or 4 rooms with a very few (16) 5-room apartments. For each of these types, a variety of options are provided to respond to a variety of needs, as well as to respond to the different layout arrangements, such as corner sites, the gateway, and the variety of floor levels.

In all, about 90 different types are provided for the apartments, and each of these has five possible arrangements. Hence, the resulting variety is virtually limitless.

Unit plans are quite simple and are based on an

kitchen is moved away from the entrance and is separated from the guest space (majlis). Varieties of these flats are shown in the attached drawings.

g) Road Network

A local, loop road services the community, located immediately at the back side of the clusters (Dars). This

road is linked to the service yards of the housing streets by short, dead-end streets. The loop road is the only vehicular route inside the community; a service road is located along the periphery of the site, beyond the housing streets. An emergency network is planned for and made possible through the courtyards of the cluster units; the other housing types are readily accessible.

h) Pedestrians

The basic arrangement of houses is formed to create a rich and continuous pedestrian network. On the level of any cluster or housing street, this is provided between the rows of houses. Gateways make the pedestrian link form a cluster to another, since all market streets are, as well, pedestrian. In the housing street, the pedestrian experience is provided in the inside space. Yet, a controlled mix between the pedestrian and the car is provided in the service yards and the dead-end streets.

i) Schools

An elementary school is on the north west corner of the site at the entrance. Secondary schools and other educational facilities are outside the site in the nearby community of El-Mohammady. Nursing schools are provided within each cluster or housing street.

2. Formal Aspects

When constructed, Dar Lamane was the largest single public housing project ever attempted. The significance of this development is not its size, but in the model of organization and form that it proposes. Like a small town, Dar Lamane appears as a traditional Moroccan town, with characteristic buildings and expressions. Yet, this apparent similarity hides a more basic formal organization which accounts for the uniqueness of this community. Some essential features of this formal structure can be seen as follows:

a) Heights

Four-storey height limits define the general character of the buildings, with slight variations on the roof top and as well in the profile of the buildings.

b) Walls

Long walls of housing are formed by the arrangement of the apartment buildings in clusters and create a sense of solidarity and cohesion. These walls are treated to express the tremendous variety of apartment types.

c) Arcades

Arcades straight on the ground level. The ground level experience of most buildings is made of arcaded streets, giving shade and providing a very beautiful and unifying sense of community.

d) Stepped Façades

Units on the upper floors project to the outside with one or more rooms coordinated through a computerized scheme. This feature provides a tremendous range of choices in the apartment plans and provides a genuine expression of variety.

e) Balconies

Balconies as outdoor rooms are provided for upper floors with different options for their use. The space of the balcony is always defined by the outside wall with a large arched opening creating a sense of an outdoor room.

f) Windows

Windows evoke participation, and are created as spaces

rather than just as openings. A 3-dimensional frame defines the window space and evokes tremendous acts of participation. Metal work, plaster, coloring, over-hangings are also made around the windows.

g) Stairs

Open staircases act as vertical alleyways; the staircases open to the pedestrian street are elegantly handled and act as a community balcony. Hangings of carpets and colorful clothing is a characteristic response to this arrangement.

h) Gateways

Gateways between each two clusters are made by projecting a room from the two units on both sides of the street. Though very formal, and with rectangular openings, the resulting experience is very rich with cultural references. Gateways to the cluster or the street is simple, arched cappings to the tall opening located between 2 buildings.

i) Minarets and Ornaments

A strictly traditional minaret complements the different interpretations made throughout the complex. Simplified ornaments and glazed tiles are used beautifully and very economically.

3. Landscaping

Formal gardens are planned for the central space around the mosque and are well maintained by the community. Central yards of the cluster were conceived as gardens, but are now used for a variety of purposes.

Informal gardens are planted by individual families in the ground floor level next to the entrances and all along the

pedestrian streets an immense variety of vegetable, crops and flower gardens are everywhere.

Every piece of land on the ground level, that is related to housing, is planted as a garden, especially at the edges and corners of buildings.

Planting flowers or mint by the windows is a common feature, adding to the overall character.

Yet, the main open space is the sports yard, which is not yet fully developed.

As well, the south, southeast and west edges are left without any deliberate landscaping.

C. Structure, Materials and Technology

1) Structural System

Isolated foundation with tie beams, the main structure is a combination of post and beam R.C. skeleton, with R.C. prefabricated bearing walls.

2) Materials

Reinforced concrete for all structural elements, except in buildings where a hamman or a bakery is located, where limestone is used both for the foundation and the walls.

Concrete blocks and bricks are used as infill materials.

Plaster and paints are used for all exteriors, and limited use is made of glazed tiles and terracotta for decorative purposes.

3) Construction Technique

Combination of pre-fabricated elements for walls, beams, windows, staircases, etc., and conventional cast-in place

methods were used to save time and to economise the construction process.

4) Design and Construction Management

A very sophisticated, computer-aided design and construction management model was set by the consultants in which all plans for housing were revised to produce maximum accuracy and efficiency of space, materials and methods of construction. This scheme deserves some detailed description:

- a) From the outset, planning and design decisions as well as all tasks in the project were managed through a decision-making model, aided by computer in which every decision was weighed in terms of "buildability".
- b) Variety of the housing unit plans were coordinated through a computer aided model in which maximum variation was reached. In a total of 4022 units, there is not a single case where two units are identical. This was achieved without compromising economy.
- c) Scheduling, specification and bidding documents were prepared on the bases of complete units of products or sets of jobs. This imaginative approach identifies elements and units, such as windows, balconies or even whole spaces, like staircases or bathrooms, as entities around which Lattice fashioned calculations are made to account for quantities, techniques, scheduling, and pricing. The significance of this approach would be appreciated if you imagine how the conventional matrix approach would account for the quantities of all items for the endless variety of this project.

This approach may have been the decisive factor in making this project possible within the limitations of time and budget, and with uncompromising variety.

- d) An experimental group of buildings was executed in early stages of the work to test all aspects of the approach before the full scale construction.
- e) The entire project (4022 units and their facilities) was completed in 30 months, 2 full months ahead of the targeted time.
- f) Actual cost of construction was 15% less than estimated.
- g) The computer models developed for Dar Lamane are now further refined and implemented in larger scale housing projects (Al-Fath and Ben Mesik), with 300% saving in consulting time.

D. Origin of Technology and Labour

Construction technology materials and labor are all local.

Architects are local and very active in the design and construction of housing and public buildings throughout Morocco.

All contracting firms are Moroccan.

Promoconsult is a Moroccan technical consulting firm, with sophisticated computer capabilities. The firm is well-known locally and internationally for its advanced programs of management and construction.

The client is an impressive development organization, staffed by young and very competent Moroccan architects, engineers, economists and market specialists. The company has very extensive and fairly large scale involvement in housing activities throughout Morocco.

IV. CONSTRUCTION SCHEDULE AND COST

A. History of the Project

Land was acquired in 1972, reclaimed and prepared for construction in 1980.

Project was commissioned to the architects and the competent technical consultant (Promoconsult) was assigned all tasks of coordination as well as the work of infrastructure and utilities, in November 1980.

All consulting work was completed by late 1980.

Construction began in April 1981.

2000 units were completed by late 1982.

The entire project was completed in late 1983.

B. Total cost and Main Sources of Finance

The total cost is 420,000,000 Dirhams or 42,000,000 US\$. The main source of finance is the National Saving & Insurance Fund, which is a national body which collects all saving and social security funds for investment and capital development. The general Building Society acquired the land and "Compagnire Générale Immobilière" was the main developer.

C. Comparative Costs

Cost in Dar Lamane was estimated at 800 Dirhams per square meter. This figure seems extremely low compared to the market value of comparable developments in Casablanca or in Rabat. Compared to middle-income housing, the figure is almost unbelievably low. Middle-income housing units will cost 5-10 as much as that of Dar Lamane.

D. Qualitative Analysis

The breakdown of costs is given as follows:

| | Percentage of Total Cost |
|---------------------------------|-----------------------------|
| Land acquisition | 2.24% |
| Registration | 0.10% |
| Reclamation and site work | 4.32% |
| Studies and consultations | 4.88% |
| Administration | 2.17% |
| Construction and infrastructure | 75.50% |
| TOTAL | 100.00% |

(420,000,000 Dirhams)

V. TECHNICAL ASSESSMENT

A. Functional Use

As a community, the project works very well. The arrangement of the clusters as well as the housing streets seems to respond to some very real cultural patterns:

1) The Central Space

With its markets and shops, works as a real center for the community. Shops, cafés, markets, etc., all are functioning with vitality and efficiency. Some overlaps of services and delivering are observed. Yet, it is quite acceptable and even used. Yet the most successful elements of the central space

are the arcades, especially these portions next to the main gates of the market streets.

2) Housing clusters

These are immensely successful - all units are occupied. Patterns of use are full, relaxed, but very vivid. The pedestrian street is used for children, mothers and is made very beautiful by the gardens on the ground level, and the hanging of colorful curtains and rugs on all balconies.

3) Housing streets

Equally as successful as the cluster, with different patterns of social interaction. Service yard and vehicle streets are used more often than in the case of the cluster.

4) Housing Units

Great deal of pride and involvement were observed in every unit during the Technical Review. The interior arrangement of the units has been comprehended by all users, and changes and modifications express the success of the plan.

5) Roads and Traffic

The loop local road seems to work as an access as well as an element that brings the car into the fabric of this community.

B. Climatic Performance

The hierarchy of open spaces creates a variety of shaded and sunny spaces which help to ventilate the whole community very well. Pedestrian streets are cool and shaded and contributes to quality and use. The arrangements of buildings give each unit at least two orientations, and make ventilation and lighting possible for every unit in the community.

C. Choice

Appropriate use of concrete stones and brick filling. The plastering and painting of the exteriors, along with the minimal use of tiles and decoration, produced a profound sense of a real community.

Appropriated Technology

The level of technology is extremely appropriate, meaning that the architect and the consultant appropriated the kind of technology need when and where it was needed:

Conventional as well as traditional technology was used for the construction.

Extremely high and sophisticated technology was used in the planning, the organization and in the construction management.

D. Ageing and Maintenance

Dar Lamane has been in operation for 3 years. Yet, it feels like a real, living and mature community. No sign of decay or deterioration is felt, except for some leakage of roof-tops.

Some cleaning problems are observed especially in the central space. However, one of the most positive aspects of this development is the way in which the community layout has helped the people to take a charge of the public land. Pedestrian streets are beautifully maintained, planted and guarded. Central yards of the cluster are run by each cluster through a variety of mechanisms. Paving of internal streets, organizing the open space, carrying the garbage all are done now by the people.

E. Design Features

The formal qualities outlined in Section III.B.3. of this report are essential features of North African architecture and expressing at the same time the rational and the technology of our time.

The following sequences outline the most significant design features:

1) Arrival

The approach to the site from Casablanca represents an outstanding experience of massing, and an interplay of shade and shadows on the white masses of the cluster, preceded by the elegant building of the nursery school, is indeed impressive. A sense of excellence, pride, and cleanliness is felt, in clear contrast to the dull and ugly surrounding public housing.

Entering the site itself, a sense of detailing, coupled with lively patterns of activities, makes the whole experience readable and appreciated.

2) Going Home

Either from the central space or from the loop road, entering the clusters, or the housing street, the sequence of a tall gate, then the intimate street to the open staircases, is well handled with a loosely structured spaces. The quality of this sequence is very emotional and quite beautiful.

3) Leaving Home

This experience is articulated through the same elements, the staircase, the street then the gateway to the outside. Yet, a very dramatic difference is experienced as you see the structure in a reserve sense.

As a whole, the articulation of the spaces is of a very profound quality.

VI. USERS

Dar Lamane is inhabited by low-income workers, craftsmen and small bureaucrats. Workers and craftsmen seem to have come from the country-side or from the mountains or the desert. A clear sense of

cultural identity is seen in their clothing, their furniture, but more so in the social habits expressed in everyday life pattern (privacy, men/women relations, visiting patterns, etc.), or in events such as weddings and in religious or social festivals (a wedding was observed during the Technical Review - See VIII.C. in this report).

Technicians and small bureaucrats are more urban in character, and in their relation to the space.

All houses are owned by the people who live in them.

PERSONS INVOLVED

A. Identification

| | | |
|------------------------|---|--|
| Client | : | 1) <u>Mr. M'Fadel LAHLOU</u> Chairman "Compagnie Générale Immobilière" (C.G.I.) The originator and the real visionary force behind the project. |
| | | 2) <u>Mr. Mohamed BASTOS</u> Secretary General of the C.G.I. Project Manager and person in charge of the daily operation from the start to the end. |
| Architects | : | <u>Mr. Abderrahim CHARAI</u> <u>Mr. Aziz LAZRAK</u> Two independent firms with extensive, yet different, involvement in housing, public building and other buildings, through Morocco. |
| Consultants | : | <u>PROMOCONSULT</u> Mr. Omar BENNANI Advance consulting firm in charge of all technical, and infrastructure work as well as the management of design and construction. |
| Community Organization | : | Many informal groups are formed within the clusters and among residences of Housing streets - one such a group was identified in cluster B, Mr. Ben Milla Ali in charge. These groups are the backbone of the community life and all repair and maintenance. |

Technical Reviewer: Abdel-Halim I. ABDELHALIM