1983 TECHNICAL REVIEW SUMMARY

Diar El Andalous Apartment Hotel
Sousse , Tunisia

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Date of Completion : December 1980

I. Objectives

Serge Santelli , Architect D.P.L.G., formerly professor at the I.T.A.U.T. in Tunis , now teaches in Paris at the University of Paris VIII , in the " Oriental City " programme , where he directs the workshop project on housing in the Maghreb .

In designing the apartment hotel of the Diar El Andalous complex , he wanted to avoid the falsely exotic character of the neo-Moorish architecture now widespread in Tunisia , which consists of adding Moorish decorative features (arches sculptured capitals , green tiles ...) to the facades of constructions corresponding to standards that are essentially international and Western in origin .

He tried to achieve a contemporary expression of the structural principles that govern traditional Arabo-Islamic architecture .

The regularity and simplicity of interior courtyards surrounded by porticoes similar to those in Tunisian fondouks ; gardens treated architecturally ; iwans , pools , fountains and pergolas are the elements which were an essential part of the spatial design of the whole .

II. Description of the Operation and its Context

Location

The Diar El Andalous residences are situated in the newly created tourist resort seven kilmeters north of Sousse : Port El Kantaoui .

The main centers of interest for tourists nearby are as follows :

TUNIS : 140 km. (Medina , Bardo Museum , Carthage , Sidi Bou Said)

KAIROUAN : 57 km. (Great Mosque , Souks)

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EL JEM : 63 km. (Amphitheatre)

SOUSSE : 7 km. (Museum , Medina , ramparts)

MONASTIR : 30 km. (Islamic Museum , Habib Bourguiba Mosque , airport)

Means of access :

By road : Taxis or rented cars ; trains and buses serve the hotel , in particular , from Tunis and Monastir .

By air : The Skanès Monastir airport is connected with the principal European cities by one or more regular flights , as well as with Tunis .

By sea : Port El Kantaoui can receive pleasure craft up to 40 metres long , with a draught of up to 4 metres . Car-ferry lines serve Tunis from Marseilles , Genoa , Naples and Palermo .

Historical Background of the Site

SOUSSE , the third largest city in Tunisia , is a port situated on the southern side of the Gulf of Hammamet .

Founded about the 9th century B.C. by the Phoenicians , Hadrumetum became a free city after the Third Punic War , but Caesar deprived it of its freedom in 46 B.C. It remained an important trading center and acquired handsome buildings and monuments . Under the reign of Diocletian it was an active center for the propagation of Christianity . It was destroyed under the Byzantine domination , which succeeded that of the Vandals .

The city revived at the end of the 7th century under the name of Sousse , and really began to develop when the Aghlabites came to power . By the second half of the 9th century it had again begun to be covered with handsome public buildings and monuments , reflections of a prosperity which was to be interrupted by many sore trials . (The city was occupied by the Normans from Sicily for eleven years during the 11th century , attacked by the Spaniards in the 16th century , bombarded in the 18th century by the French and the Venetians , and badly damaged during the Tunisian campaign in 1942-1943 .)

Local Architectural Character (including prevalent forms and materials)

Traditional Tunisian domestic architecture is made up of low houses (one or two levels) arranged around courtyards or patios . It is architecture turned towards the interior .

All the ground-floor rooms are reached by the patio or patios (according to the size of the house) and do not communicate with each other . When there is an upper level, a gallery running around all four sides of the patio links the upper rooms with one another .

The reception rooms have a characteristic T-shaped plan .

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Decoration and ornaments are used in the courtyards (ceramics , porticoes , columns and galleries) .

The roofs are always terraces , and are accessible .

In traditional Tunisian Muslim homes , the central patio cannot be reached by a straight path from the street door : one or more halls (skifas) are so arranged as to impose a zigzag route on the visitor and to prevent the interior of the house from being seen from the street .

In big houses , these skifas may also give access to service rooms or to secondary inside corridors .

Topography

The site slopes very gently towards the sea . It is flat and partly planted with olive trees .

Climatic Conditions

The climate is of the Mediterranean type . The average temperature in January is about 12°C. ; the average for the summer months is around 27°C. Evenings tend to be cool .

The Diar El Andalous complex

The Diar El Andalous complex occupies 19 hectares and includes :

A four-star luxury hotel with 282 rooms on three levels ;

a first apartment-hotel , or " residence " , which is the subject of the proposal for the Aga Khan Award for Architecture in 1983 ;

a second apartment-hotel is under constuction , replacing the programme of separate houses originally planned ; and

restaurants , bars , boutiques , a night club , a beach club with a covered , heated swimming pool , an outside swimming pool , a bowling alley , a sauna , a gymnasium , 8 tennis courts (6 of them lighted) , and an " adventure playground " for children , with a day care center , complete the complex .

Only the first apartment hotel is the subject of the present report .

Programme of the First Apartment Hotel

1 restaurant (4 rooms , each with a capacity of 20 seats)

1 kitchen

1 storeroom

2 cold rooms

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1 vegetable room

1 dishwashing room

1 garbage room

1 staff dining room

1 block of showers and lavatories for staff

1 boiler room

1 laundry room

1 service courtyard

3 salons (front office and reception rooms for clients)

1 bar

1 terrace on the first floor , for Turkish coffee

1 clients' lavatory

1 manager's office

1 accounting office

1 personnel office

1 lavatory for the administration

III. Design and Construction

Architect's Aims ; responses to functional requirements

The site proposed to the architect is 300 meters from the sea .

Since the land has no relief , he had few planning possibilities . If he had wanted to take advantage of the Mediterranean and offer sea views from the rooms , he would have had to design a high building , which would have been totally out of place amidst the horizontal lines of the site and surroundings .

To forget the sea and " spill out " over the land , making the most of the immediate environment , might have been a solution if the site had had sufficient landscape interest (views , perspectives , strong arborescent vegetation into which the building could have been integrated , etc.) . But the site does not have any of these characteristics ; it is rather of the " desert " type .

The only approach remaining to the designer was to make his project an architectural landscape and event . He created and concentrated the architectural event at the very centre of his plan . Out of nothing , he created a new environment which is rich for the user and makes him forget the banal surroundings .

The rectangular configuration of the plot guided the architect in his approach , and is at the origin of the linearity of the plan . This latter is centered on a series of courtyards taking advantage of the shape of the plot .

Aspects of the Design

Description of the project :

Area of the plot : 33,000 square meters

Built-up area : 10,150 square meters

Overall Organization

The apartments are grouped inside courtyards by which they are reached , and outside courtyards by which they are linked . All the courtyards are connected along a main longitudinal axis , on which secondary distribution axes open . The succession of these courtyards along a simple path gives its original character to this apartment hotel , recalling the succession of patios and gardens in traditional Arabo-Islamic palaces .

The height of the residence does not exceed Ground Floor + 2 . All roofs are of the terrace type .

The courtyards are paved and bordered by two or four porticoes , thus reminiscent of the courtyards of Arab houses . Regular , square or rectangular , the volumetry is always simple and pierced by little windows protected by mucharabieh shutters . The courtyards which are surrounded by porticoes on all four sides are inspired by the foudouks of Tunisia , and their austere architecture contrasts with the refinement of the ceramic decoration around the windows.

The interior courtyards are of different sizes and volumetry and their treatment is varied ; some of them are planted with orange trees or jasmine ; they have the quality of real interior gardens . The outside courtyards and squares are larger and do not have the more intimate atmosphere of the inner courts .

A parking lot for about forty cars is located near the entrance to the residence ; a private road gives access to the service court .

An Architecture of Gardens

Paved or planted with trees and flowers , the courts are all treated like interior gardens , made more agreeable by such features as pools , little streams of water and fountains , which reinforce their Arabo-Islamic character . Water is an important element of the project ; it fills pools lined with traditional ceramic tiles , runs off through little channels and finally gushes forth in fountains under pergolas . In most of the courtyards , niches protect strollers from the sun , recalling the iwans of Moroccan houses and medersas .

The architect is responsible for the landscaping of these courtyards ; the plans of the landscape architect of the

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operation were carried out only for the access roads and the planting around the parking lot .

The Apartments

They are always reached by an interior court and have one or two rooms (in seven cases , three rooms) opening on a private garden or , for the apartments on the upper level , on a private terrace protected by a high wall . An alcove opens in the axis of the living room , a reference to the qbu or m lez of traditional houses . The services are on the entrance side . The rooms have French windows opening on the private garden or terrace and little windows protected by mucharabieh shutters on the side facing the interior courtyard . Having the rooms open on the private garden or terrace allows a family use of the latter which is very well adapted to the lifestyle followed by tourists .

The floors are covered with ceramic tile , made in Tunisia by SOCER . In the living room these are white blue borders ; in the service rooms , the colour scheme is reversed .

The Decoration

Although the client had asked a decorator to draw up a plan for the decoration of the apartment hotel , the architect was eventually led to take charge of the decoration himself, in agreement with the client , since the decorator chosen had failed to produce any working drawings , except for the furniture .

Response to Physical Constraints

Siting

Rejection of the banal surroundings , and creation of a built-up universe , a new landscape in itself (see preceding paragraph) .

Climate

The fact of having openings on the courtyards and patios fits not only the requirements of the site but also those of the climate . Added shade and coolness are provided by the presence of pergolas and of the outside galleries by which the rooms on the upper level are reached . All these architectural components correspond perfectly to the re-quirements of a climate that is relatively warm in summer .

Reponse to Cultural Traditions

As stated under the architect's objectives , the design is based on the use of the traditional features of local architecture (interior patios , architecturally designed gardens , ceramic decoration , etc.) .

Response to the Requirements of Users and Staff ;
Spatial Organization

After a day in the sun , on the beach , guests find in the Diar El Andalous residence outdoor public areas of high quality which extend the private space they occupy . The

rooms and apartments are arranged around patios decorated with faience , fountains and planting which , by four or five o'clock in the afternoon , are haunted by both adults and children .

The apartments provide accommodations for a variable number of people , according to the size of the family . The one-room apartments are designed for one to three persons , the two-room apartments for four or five and the three-room apartments for five or six .

All the apartments are equipped with a kitchenette that includes a cooktop , a sink , a 140-liter refrigerator , storage cupboards and cooking utensils , dishes , glassware and cutlery .

Household linen is also furnished .

The apartments are clean everyday , with a more thorough cleaning twice a week .

The studios (one-room apartments) have a shower , the two-room apartments a bathroom , and the three-room apartments a bathroom and a shower room . All have telephones connected with the switchboard . They are heated in winter . They were designed without air conditioning for summer use ; however , individual air-conditioning is now being installed .

The private garden or terrace attached to each apartment is an important feature from the point of view of comfort ; it allows the occupants to take a sunbath , or to eat breakfast or have a cool drink together outdoors , without being observed by others .

Clients of the residence have a restaurant and bar at their disposal , and may also use all the services provided by the Diar El Andalous complex (swimming pools , tennis courts , discothèque , etc.) .

Inspired by local tradition , the spatial organization corresponds perfectly to the demands of clients who are mainly foreign and who find in this apartment hotel a style of accommodation that is quite different from their own .

As for service , the residence is completely independent , with its own service quarters . The main laundry is next to the furnace room , and the kitchen , storage rooms and two cold rooms open on a service courtyard accessible by a service road .

The furnace room opens on the same courtyard , as do the sanitary facilities (showers , toilets , cloakrooms) provided for the staff .

For each patio , there are two service rooms per floor .

These arrangements make for service that is efficient and perfectly discreet ; no service premises or service road may be seen from the areas or traffic routes used by the hotel guests .

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Security

A team of eight watchmen equipped with a radio system is responsible for security . The outside doors of the patios are equipped with wrougt-iron gates which are locked at night , leaving open only the main entrance , via the front office .

Purely Formal Aspects : masses , articulations , volumes , facades , decorative features

The overall compositon reflects perfect mastery on the part of the architect in designing and assembling simple volumes and empty spaces , in giving rhythm to facades , in decorating the free spaces with pools , fountains , gardens or planting , and the facades with bands of ceramic decoration or traditional tiles from Nabeul as well as wooden mashrabiyas .

Landscaping

Galleries , pergolas , outside staircases , arches and beveled angles are decorative features which form an integral part of the design . They make for constantly changing views , an interesting play of light and shadow at every turn , and a very strong attraction towards each patio or little square .

At night , judicious lighting of the ensemble , especially the pergolas , gives rise to a new perception of the building .

Structure , Materials and Technology

Type of Structure

Walls : The building is a bearing structure , made up of cast concrete walls 18 cm. thick .

The mode of construction proposed by the architect was stone and concrete block masonry according to traditional technology . The firm which obtained the contract (SOMATRA) " imposed " a cast-concrete technology on the client , promising a considerable reduction in construction cost and faster completion of the job .

In fact , these objectives were not achieved , because the work force had had no experience with the technology adopted.The metal forms were not properly adjusted , and the openings left for doors and windows were not straight . Many hours of manual trimming had to be spent to straighten the openings and smooth the walls . The time gained by the use of the metal forms was spent by the workmen in repairing defects .

Foundations : concrete slab foundation

Floors : They are made of slabs of reinforced concrete , made on the job and hoisted into place with a crane .

Nature of the waterproofing of the roof terrace and other terraces

The single-coat , " Derbigum " system was used .

Other Materials used

Partitions

The interior partitions separating rooms are of 6-hole hollow brick , coated on both sides with cement mortar ; their finished thickness is 10 cm.

Lining walls : The outside walls of cast concrete are lined with inside walls of hollow brick , with an air space of 4 cm. between the two . The finished wall (concrete wall + lining wall) is 35 cm. thick .

Floor coverings

All the materials used to cover the floors are of local origin .

Apartments : blue and white tiles manufactured by SOCER according to a special drawing made by the architect .

Salons and public rooms : stone of the KEDDEL type , gray marble or " Agglo-marbre " (a marble agglomerate) .

Galleries and passageways : pink cement tiles , stone or marble .

Ceiling coverings

Reception rooms and bar : The ceilings of the reception rooms and bar are made of staff , and imitate the painted wood ceilings of Tunisian houses : the staff components that simulate wooden beams are painted red and green , accented by thin lines of yellow .

Apartments : The underside of the slabs in the living rooms and bedrooms is plastered .

In the entry and the living-room alcove the ceilings are of staff .

Wall coverings

Facades

Outside walls are covered with a "rustic style" sprayed mortar rendering in a light ochre color.

At present the manager of the apartment hotel is replacing the ochre by white , which is regretable from the point of view of the project's relationship to its environment .

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The choice of a sprayed mortar coating was imposed on the architect by the client for economic and " aesthetic " reasons .

Inside courtyards : Here the walls are covered with a smooth rendering , painted white . The architect wanted the landscaping of the courtyards to provide a distinct contrast with that of the external environment .

It should be noted that the manager of the establishment is gradually replacing the smooth rendering of the walls of these inside courtyards with " rustic style " sprayed mortar.

Decoration of the walls of the inside courtyards

The windows are surrounded by bands of traditional tiles from Nabeul , accented by black borders which form frames similar to those that decorate the courtyards of traditional Arab houses .

The qbu niches , surrounded by built-in banquettes , which open on certain courtyards are also covered with faience (of the traditional Maadenousi type) , whose brillant texture and strong color contrast with the flat white surface of the surrounding masonry .

The courtyard where clients are received is completely covered with faience ; framed panels accent the outlines of the openings .

Bathroom walls

Tunisian tiles from Nabeul .

Joinery

All joinery is wood , traditionally made .

Windows

They are small in size and are made by the same technique as traditional window : placed flush with the outside wall , they are made up of two panels which open into the thickness of the wall , and have inside shutters attached to the panels .

On the outside , they are protecxted by shutters of the mucharabieh type , which filter the light .

Inside and Ouside Doors

They are all made of wood , with the doors painted light green and the frames a darker green . The French windows are equipped with mucharabieh-type wooden shutters , painted green .

Guard Rails

Certain outside galleries are protected by concrete rails , painted white , others by simple wooden balustrades , painted green .

Wind-breakers and sunlight-breakers

At the end of certain galleries , wooden panels of the mucharabieh type help to protect the courtyards from the wind and sun and strengthen the decoration . They are painted green .

Construction Technology ; labour employed

The bearing walls were cast on the spot between two metal forms ; the reservations necessary for the openings were placed between the forms . Then the slabs , previously made on the spot , were hoisted and set in place on the bearing structure . The partitions and lining-walls were constructed of hollow brick in the traditional manner .

All components of the structure were made on the spot .

Two cranes had to be set up for pacing the metal .

The labor used was 100 per cent Tunisian ; 20 per cent of the workers were skilled , 80 per cent unskilled .

Building services

The building is centrally heated , with an oil furnace and cast-iron radiators .

At present , only the public rooms are air-conditioned . Unlike the heating, the air-conditioning is not independent, but comes from the hotel via a cold-water circuit .

Individual air-conditioning for each apartment is now being installed .

Hot water is furnished by an electric storage heater .

Garbage is removed by the municipal services .

Origin of :

Technology	:	Conventional technology of the European type was imposed by the nationalized firm that obtained the contract .
Materials	:	Local
Labour	:	100 per cent local
Professionals	:	Architect (French) Associated architects (Tunisian) Contractor (Tunisian) Consulting engineers (Tunisian)

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IV. Construction Schedule and Costs

History of the Project

Program	:	Started	October 1977
		Completed	December 1977
Planning	:	Started	December 1977
		Completed	September 1978
Construction	:	Started	April 1979
		Completed	December 1980
Building occupation	:		June 1981

These dates do not correspond to those furnished previously either by the client or by the contractor , but were studied recently with the latter .

Total costs and main sources of finance

Original budget : 2 000 000 DT (Tunisian dinars)

Overall cost : 2 400 000 DT

which may be broken down as follows :

Land	250 000 DT
Materials	900 000 DT
Professional fees	160 000 DT
Miscellaneous	290 000 DT

These figures are approximate and cannot be checked in detail .

Sources of finance (Information obtained from the C.T.K.D.)

National	40 per cent
International	60 per cent

(International , within the framework of bilateral cooperation between Kuwait and Tunisia . The Kuwaiti Fund for Arab Economic Development intervened , through the Consortium Koweitien d'Investissement Immobilier (CKII) , represented in Tunis by the DTKD .)

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V. Technical and Aesthetic Assessment

Functional assessment

As well as the consultant can judge after a visit in midwinter to a project that was practically empty of tourists , the apartment hotel seems to function quite well during the summer season ; that , at any rate , is what the manager says .

In support of this claim is the fact that , in two and a half years of operation , the only change made has been the installation of wrought-iron doors or gates in the patios to close them off from the outside for security reasons .

Climatic performance : lighting and ventilation , orientation

Heat insulation

The technology used (cast concrete , 18 cm. thick , lined with an inner wall of hollow brick , with an air space of 4 cm. thick , lined with an inner wall of hollow brick , with an air space of 4 cm. between the two) guarantees the good quality of the heat insulation of the building .

In spite of the wishes of the architect , who had planned to have the structure built of traditional masonry , concrete was used , and the apartments on the south side turned out to be relatively hot . During construction , the architect asked that , for these apartments , the brick wall should be placed on the outside and that the air space should be ventilated to avoid this disadvantage . But he could not prevail on the client and the contractor to do so .

However , the company that manages the building decided , this year , to have individual air-conditioners installed in each apartment . Tourists demand lower temperatures for sleeping than can be achieved by insulation and natural ventilation when the outside air is more than 30°C. during the daytime . This equipment will also enable the hotel to maintain its standing with relation to other air-conditioned hotels .

Sound insulation

Partitions with a finished thickness of 10 cm. and floors 25 cm. thick insure correct sound insulation . Here again , it should be noted that because the consultant visited the building during the off-season period , she was unable to judge the noise arising from the use of the public areas and its propagation through windows that are necessarily open , during the hot season , for the natural ventilation of rooms not yet air-conditioned . However , the outside walls are thick , and the windows opening on the public areas are very small .

Once the air-conditioners have been installed , this question will be practically irrelevant , since the apartments will remain closed to the outside .

Orientation

There is no privileged orientation in this project . All the apartments have a double exposure : southwest and northeast .

Lighting

The respect of a traditional mode in the design of the hotel allows subtle variations in natural lighting to be obtained,according to the area .

The luminosity decreases as one goes from the big courtyards located on the axis of the building to the lateral patios , smaller and more closed in , and to the apartments , where the light penetrates only through openings which are all equipped with shutters of the muchrabieh type and with curtains allowing the user to obtain exactly the intensity of light he desires .

The design of the openings also contributes to this effect, since the windows on the more luminous courtyards are small, whereas those on the terraces and gardens are of large dimensions .

Artificial lighting is well planned and of good quality . Particularly noteworthy is the outside lighting of the building at night , which , as pointed out in paragraph III, gives rise to a new perception of the ensemble .

Ventilation

The very design of the building , giving each apartment a double exposure , one on the patio and the other on a private terrace or garden , allows good natural ventilation of the rooms .

Rooms that tend to be damp have double ventilation (a window and a built-in air duct) .

Choice of materials and level of technology

Materials , fabric and technology

In the paragraph on the structure of the building , it was explained that the technology adopted by the client was not that recommended by the architect . The experience of using a level of technology a bit too sophisticated for an unprepared labour force taught the client a lesson : for the third section of the complex (which is not a candidate for the Award),traditional masonry techniques were chosen .

Materials used for decoration

The decoration materials chosen are of high quality , for a least two reasons :

For one thing , they are traditional materials , still made locally by local craftsmen .