REFLECTIONS OF TRADITIONAL CONCEPTS ON MODERN DESIGNS

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ABSTRACT:

Architecture within a certain region reflects its characteristics. Culture, traditions and climate conditions are among several parameters that constitute the regional character. Awareness of these characteristic parameters is essential for architect to design within any region. The Arab gulf region has a unique character that draws sharp lines to its architecture and urban pattern.

This paper presents a process to analyze the characteristic parameters within the Arab gulf region. Through this process a survey of the climatic conditions, the local culture and habits were investigated. The old cities urban pattern and some of traditional buildings were analyzed. This followed by analysis of local design concepts and details, and how those designs mitigate with the environmental needs. In addition, design guidelines and recommendations for urban, landscape and architecture were concluded.

Moreover, a conceptual design for a cultural village in Doha City is developed as a case study to apply these recommendations. Through this proposal, a comparison between two alternatives is presented. The first illustrates a classical approach with deep respect to both the traditional concept and vocabulary. The second suggests a modern approach, which is a composition of modern patterns and traditional vocabularies.

KEYWORDS

Architecture, Culture, Arab Gulf, Climates.

1. INTRODUCTION

Searching for a comprehensive approach to develop conceptual design within the Gulf area, the paper investigates several aspects affecting such process in this area of the world.

The Gulf area Climate has a vital effect on the style of life, the traditional architecture and the urban pattern.

Since the sole of the intended project is the culture, the Gulf traditional work of architecture and the archaic Islamic patterns, have an important influence on any suggested design concept or urban pattern. The traditional Architecture elements and patterns were analyzed to find out how does it respond to the climate stress and the cultural needs. Then, the main guidelines for designing a compatible building design and urban pattern with the culture and climate in this area concluded.

Next step in the suggested process is to analyze the project program and the proposed site location to conclude general design concept. Two approaches were introduced as a result.

The first approach imitates the traditional architecture in both, the concept and the detail. On the other hand, the second approach, where the traditional concepts were adapted and the traditional architectural elements were developed in new modern forms. Both solutions were compared to conclude the advantages and disadvantages of each of them.

2. Factors Affecting Local Architecture:

Design should reflect the character of the building surroundings. Each area has its unique character. Several aspects constitute this character. The following sections illustrate the main aspects forming the Gulf Area Character:

2.1. Geographical Aspects:

Terrain is varied but on the whole it presents a barren and harsh appearance with salt flats, gravel plains and sand dunes but few lakes or permanent streams. Although land along the Gulf shore consists of flat rocky surfaces, it includes some hills and sand dunes, which reach an altitude of 40m above sea level.

2.2. Climatic Aspects:

Among all the factors affecting building's design, Climate is the dominant one. It affects people's life and forms their habits. It dictates how and where people can carry out their life activities.

The Gulf Area has a desert climate. It is subject to a great extreme. High temperatures during the day followed by comparatively cold nights. The maximum temperatures are high especially in summer. The temperature ranges between 25 C° and 45 C°. Even in winter, temperatures during daytime are relatively high. Lack of rain is a chief factor in this area of the world. In winter, The average rainfall does not exceed 75.2mm annually.

Strong winds and sandstorms are characteristic of the climate of this area, especially in summer. They blow hardest during the day. Although their speed does not exceeds 80 km / hour and averages over the year 16 km / hour, the effect is enhanced by the high temperature and lack of shelter.

Other factors such as latitude, proximity to the sea and altitude, also affect the climate. Despite the fact that of the Arab Gulf Area considered within the hot dry zone of the world, the great water body of the Gulf has a major influence on the microclimate of the coastal area. It raises the humidity percentage between May and November to extents that turn the overall climatic characteristics to a hot humid characteristics.

2.3. Souci-cultural Aspects:

Population: The people of this area of the world are of Arab ancestry, though there are a number of families of Persian origin. The overwhelming majority of inhabitants of Gulf area, descended from the indigenous tribes and still today maintaining tribal affiliation. The area has supported agricultural, herding and hunting cultures for thousands of years. The birth of Islam, about AD610, was an important historical event. It affects people style of life

Art: Arabs have a poetic tradition that goes back to pre-Islamic times. Poetry and storytelling are common folk traditions. The Qur'an limits public performances of music and dance (pictured) and prohibits the making of graven images by artists. Hand-lettered Qur'ans are produced with complex geometric and floral designs.

Clothing: The religion and customs dictate conservative dress for both men and women.. Men wear the traditional dress called a thobe. It is perfectly suited to the hot climate. A man's headdress consists of three things: the tagia, a small white cap that keeps the gutra from slipping off the head. When a woman appears in public, she normally wears a voluminous cloak called an abayah, a scarf covering her hair and a full-face veil.

2.4. Traditional Architecture:

The traditional work of architecture is an important resource for the architects when designing a cultural, major-scale project. The architectural vocabularies should be studied comprehensively. The following sections illustrate some of the focal vocabularies and concepts of the Arab Gulf Area.

2.4.1. The Wind Tower:

Wind catchers or wind towers is common in several parts of the Muslim world. Their function is to catch the breeze and funnel it into the spaces below. The route of the wind falls for most of its length in an enclosed funnel. Air passing through it loses much of its heat to the surrounding walls and increases considerably in velocity. This generates air movement, which brings down the temperature of the interior of the building.

Several designs are well known in the world. The multi-directional wind towers of the Arab Gulf designed to catch the wind from whichever direction it comes. There are preserved examples of this wind towers among the ruins of Wakra. **Fig. 1** illustrates one of these examples. **Fig. 2** shows the only wind tower house of its kind remaining in Doha, which is the restored house in Doha Ethnographic Museum (The Wind tower House) Built in 1935 in and restored in 1982.

Both are of the Badagir type: a square structure on the roof of the house with openings on all four sides. Providing the ventilation and breeze to the spaces of the building, the designer relieves himself from the limitation of having to orient the rooms to the prevailing wind.

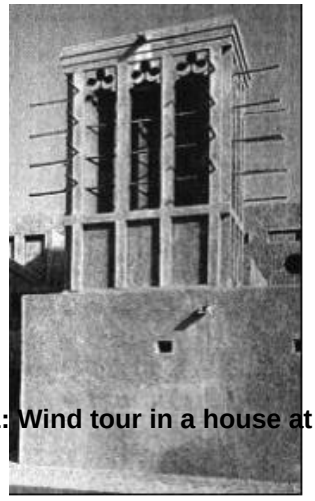


Figure 1: Wind tour in a house at El-Wakra

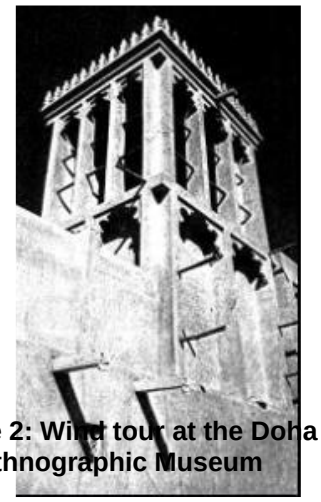


Figure 2: Wind tour at the Doha Ethnographic Museum

4.2. The Courtyard

Looking at the courtyard, one is repeatedly struck by their degree of adaptation to the climate and by the skill and discrimination of their builders. It is a distinctive way that provides ventilation, privacy and a more consolidated architectural pattern. **Fig. 3, Fig. 4** illustrates two examples of the internal courtyards.

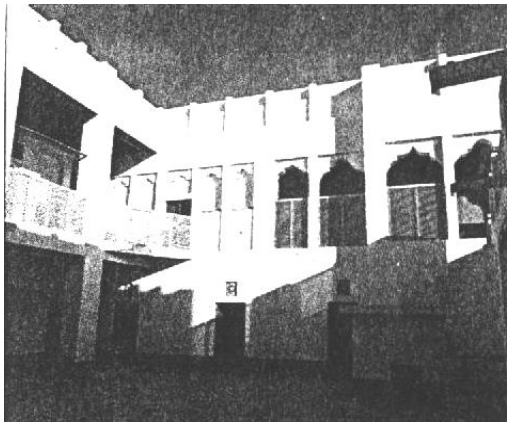


Figure 3 Courtyard in Doha, Qatar

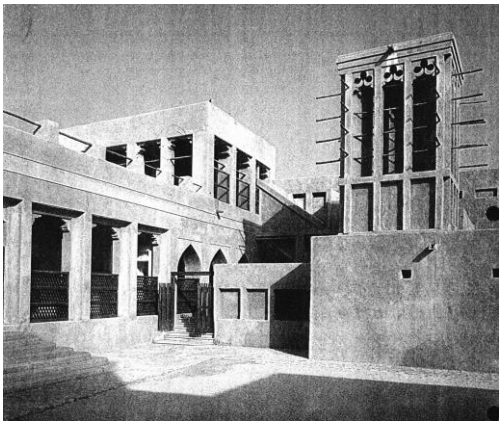


Figure 4 Courtyard Dubai, Emirate

2.4.3. The Sculptured Walls

These elements were used traditionally to reduce the thermal impact on the outside walls. Each one of them is adapted to and derived from the ornaments of the ancient Qatar resembles several designs of plants and geometric formations. **Fig. 5** illustrates the outside wall of the Qatari museum, while **Fig. 6** illustrates a fragment of the Qatari Red Christ building.

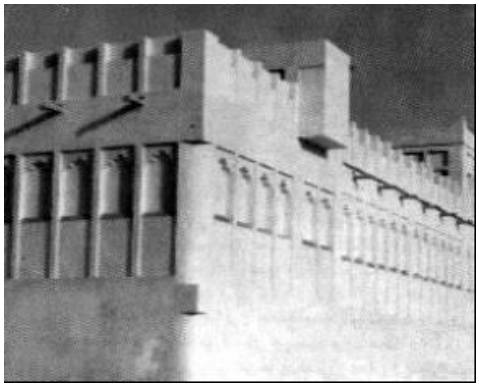


Figure 5 Outside walls of the national Qatari museum

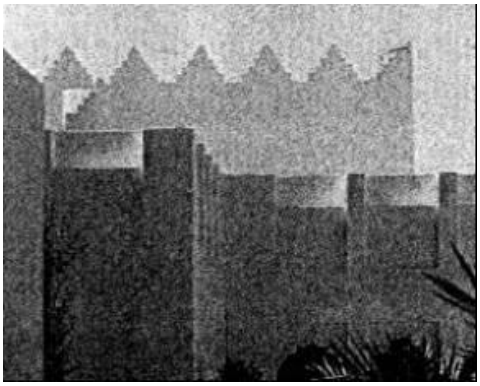


Figure 5 Outside walls of Qatari red christ

2.4.4. The Gates:

People of this area are very fond of the gates. Every old or modern building does have at least one gate. Privacy is a dominant factor in the architectural design of Qatari Architecture. Ground floors rarely do have outside openings. Gates and doors do not have any direct access to the building or even to the courtyard.

Figure 7

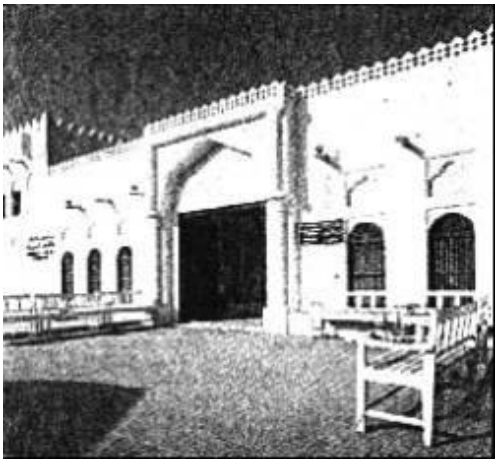
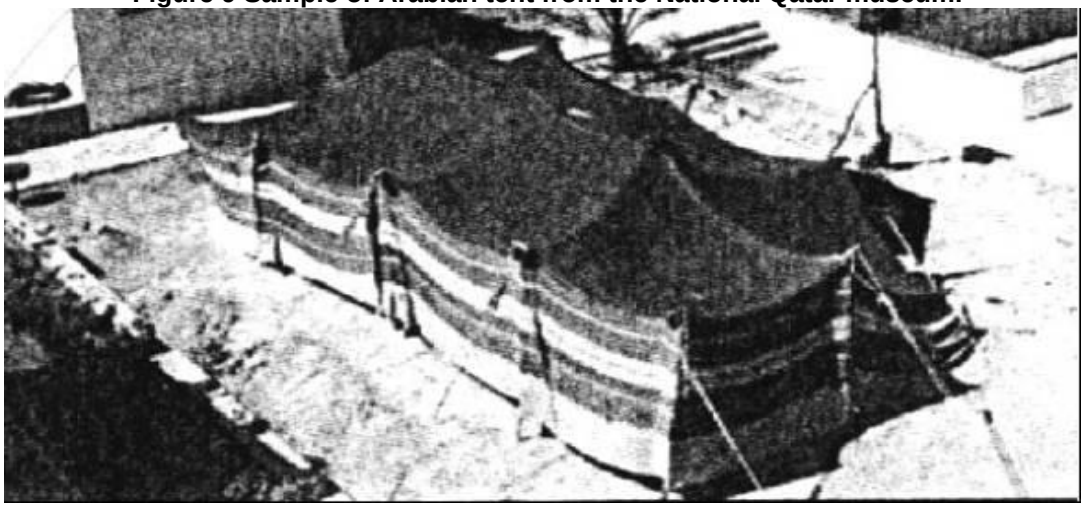


Figure 8

2.4.5. The Tents:

Tents are one of the main traditional Arabian symbols. Ancient Arabs has developed their own design. The Bedouin of the Arabian Desert uses a black tent known as the beit al-sha'r, or 'house of hair'. The size of the tent depends on the importance of its owner. A family would use a tent made up of narrow strips, each seven and half meters long, supported by two tent poles. **Fig. 9** illustrates a traditional tent from the court of National Qatar Museum. As shown in the figure, the tent cloth is woven loosely to allow heat dispersal. In fact tents has been used before the age of oil and the modern technologies. Nowadays, It is part of the traditions and festivals.

Figure 9 Sample of Arabian tent from the National Qatar museum.



2.4.6. The Urban pattern:

As a response to the stressed climate urban pattern of the Old Gulf City get its special features. Compactness is the main feature as it is noticed from the Arial photograph for Doha City in **Fig. 10**. The urban pattern is pattern with a lot of courtyards. This pattern is served with main narrow irregular path with several branches.

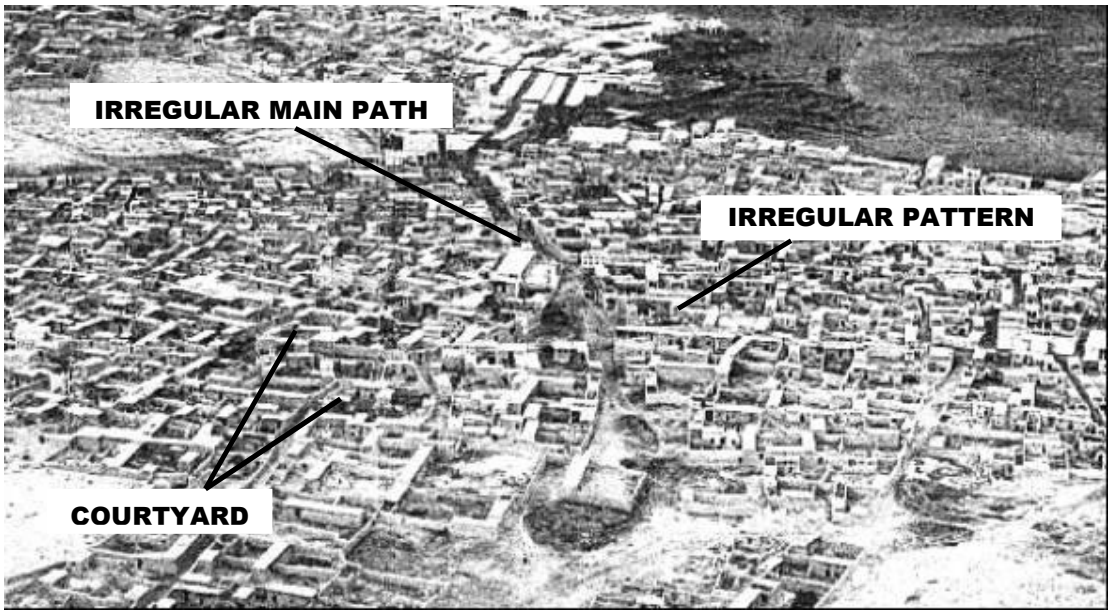


Figure 10

5. Recommendations and Guidelines:

In Such Area, Designer should consider the following objectives for his building design:

- Reduce heat production.
- Reduce radiation gain.
- Promote evaporation loss.1

To fulfil design objectives, the following the recommendations for layout planning, landscaping, and building design could be applied:

5.1. Recommendations concerning the layout:

- Building types and forms are tightly associated with the overall *climatic conditions*. Accordingly, it is desirable to adopt the compact form into any layout composition to cope with climatic constraints and high-energy consumption in such stressed climates. This sounds appealing to the Arab cultures in particular, where people have adapted to living in proximity to each other. This adaptability—developed over the centuries—stems from the strong tribal and kinship relations deeply rooted in these societies.
- In flat areas, the integrated use of *water* is both possible and desirable.
- *Accessibility* to and within the site is essential. Likewise plans should provide easy and conventional movement without loss of privacy or crossing between vehicular and pedestrian movement.
- *Windward* sides are desirable; specifically, locations near crest slightly offset from prevailing wind direction receive most air movement. Southern and northern directions rather than E and W sides are preferred because of less radiation.1 Accent should be on scattered buildings to utilize air movements.
- *Parking lots* should be provided as near as possible to building entrances. A shaded pathway to link parking areas and buildings is an important consideration.
- In order to improve *orientation* and provide a stimulating environment within the layout, pathways should be arranged into a system of paths, zones, activity nodes, landmarks, districts and edges.

5.2. Recommendations for landscape design

- An important feature of landscaping is the psychological freedom in the view of nature, which it always produces. Besides, its natural elements; including trees, rocks, and bodies of water can get hardly out of date.

- The landscape design elements, including plant materials, trees and shrubs, walls, and fences can create high and low pressure areas around a building with reference to its apertures. Care should be taken that arrangements do not eliminate the desirable cooling

breezes during overheated periods, planting should be designed to direct and accelerate beneficial air movement into the building.1

- The following points summarizes the criteria for proper planting:

1. Plant material should be used as a means to modify climate; thus, reducing cooling costs.
2. Vegetation as trees, shrubs, creepers, and ground covers can be effectively used to improve both the soil and the microclimate of the building by providing shade, evaporative cooling, ventilation control, sheltering, and providing for privacy3

5.3. Recommendations for building design

- Buildings should be *shaded* structures, which encourage cooling air movements; shade protection should be on all sun-exposed sides, mainly on roof and E and W exposures.
- As temperatures are not to excessive, *free plans* can be evolved as long as the building is under protective shade; a free air path through is important.
- Strong *radiation* effects on the E and W sides should dictate the shape of building to a slender elongation. The optimum shape is 1:1.7, but up to 1:3 on the E-W axis is also acceptable. A volume effect is undesirable.
- Sol-air *orientation* is balanced at 5° E of Sound, with relatively small deviation from it (10°) to remain desirable. Orientation with long side toward differing wind directions is acceptable only under shaded conditions.
- Orientation of the *openings* should be considered with sunshine, light, and view. The penetration of direct solar radiation should be avoided, while both daylight and direct view to the environs are essential in all climates.
- *Interior spaces* must be shaded, well ventilated, and flexible. The use of screened, movable, or low partitions is desirable. Floor materials must be impervious to moisture. Daytime living areas should allow the flow of E to W winds.
- In order to avoid *glare* both inside and outside, colors in the pastel rang are preferred.
- *Sun breakers* are important because of powerful radiation mainly on E and W sides; note also that the N walls get more radiation impact in summer than S walls3

6. APPLIED CASE STUDY:

Recommendations were implemented in a cased study, which is a conceptual design for a cultural village in Doha, Qatar. This project is designed and submitted as a first phase in a competition held by the Qatari's Ministry of Agriculture and Municipal Affairs. The general atmosphere of the project meant to have the traditional and historical Qatarian Spirit. It was needed to reflect the Gulf Architecture, which is rich in ornaments and carving, and uses all the modern facilities available in the 21st century. The project program contains the following activities:

- Conference and meeting hall, which can be used as a theater and lecture hall with all the necessary facilities.
- Group of buildings linked with each other horizontally to house the following public societies:
    - The Qatari Fine Art Society.
    - The Qatari Photography Society.
    - The Qatari National Folklore.
    - The Stamp Collection Club.
    - The Union of Qatari Scholars and Writers.
- The shopping center building consists of a bank, shopping areas, photo studio, restaurants, internet cafés, and restaurants.
- Museum of the History of Qatari's Navigation and Gulf Pearls and Marina.
- Open plazas for shows, carnivals, fairs and public festivals.
- Model of a Productive Traditional Qatari Village.
- Environmental exhibition for children
- In addition to the above, premises should be provided for:
    - The center of futuristic studies.

- The Arab Gulf State Folklore Center.
- Arab Town Organization Prize H.O.
- Branch of Qatari National Library.
- The Music Institute.
- The Weapons Museum.

6.1. The Proposed Site Location:

A location besides the seashore of the Gulf was selected for this project. Neighboring to this site is an already established recreational area. **Fig. 11** illustrates a map of the site and its relation to the north and the Gulf seashore.

6.2. Decision-making Process

There was an immediate need to establish a set of hypothetical solutions to overcome this argument. It was important to clarify, however, that each activity within a certain facility has its unique functional, social, psychological, and safety needs to be met, regardless of its location. **Fig. 12** presents a general zoning diagram for the main elements of the program.

Figure 11 Proposed site location

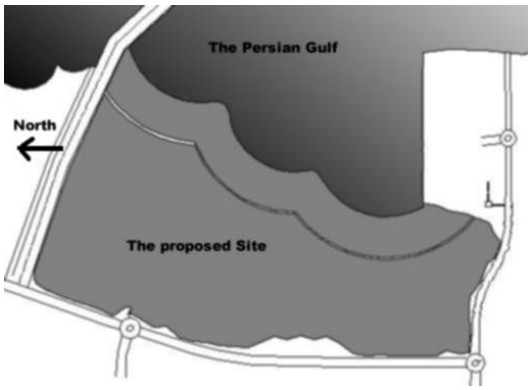
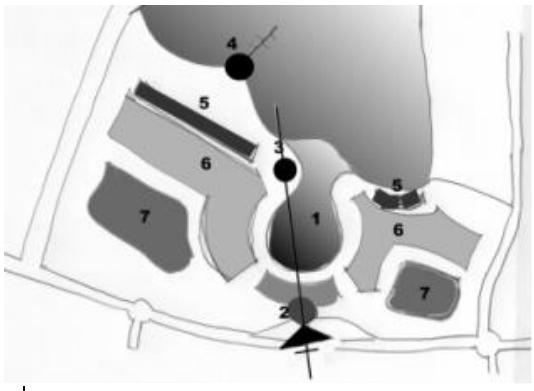


Figure 12 Proposed zoning diagram



Key to figure 12

1. *Main entrance*
2. *Marina*
3. *The Village buildings*
4. *Water penetration into the site*
5. *Main building (focal point)*
6. *Cafés*
7. *Parking lot*

6.3. Criteria used in forming the concepts

A number of limitations have been highly effective over the concept. They were as follows:

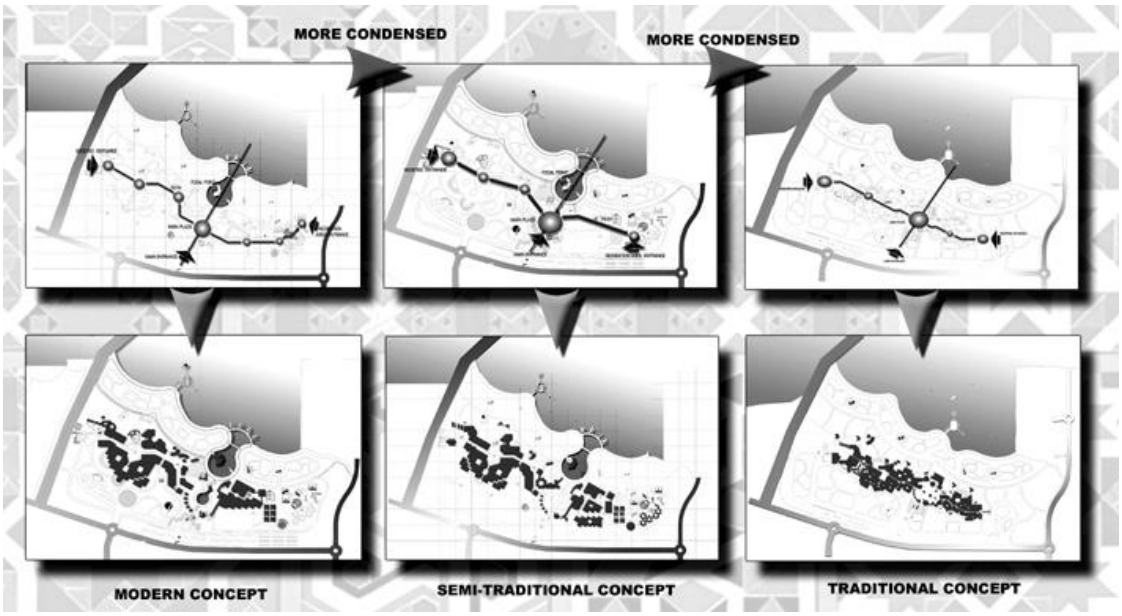
- The proposed location was on the coastal line of the Gulf. It have also its own marina, which would be used for sea excursions.
- The location embraces a beach area of approximately 150 meter complete with some extra 50 meter walkway to segregate beach area from village
- Although the processing and merging of facilities together occurs only occasionally to a far lesser extent in all concepts, the pedestrian participates directly in it.
- Local café's needed to be built along the beach of the cultural village. The style of such cafés should echo the traditional way of construction, i.e.; the use of tree trunks in roof together with palm tree leaves, in addition to gypsum decorative works.
- The urban pattern of the cultural village needed to have alleys and walkways which should appeal to visitors and encourage them to visit commercial market places and exhibition areas while children have special playing areas.

6.4. Developing the concept

Figure 13 Three different approaches to develop the pattern.

In moving towards more regionalized directions of architecture, the concept is based on the belief in a stimulating architecture that provides a considerable interaction between modern and traditional aesthetic values.

As argued earlier, this solution has emerged as a reaction of the formation of the land, and the limitations of the site (gulf, transportation system, topography, etc.)



Climatic limitations have been put into consideration, providing shaded areas, adequate ventilation, spaces between buildings to attain free movement of the summer breeze, and large areas of water bodies.

The conceptual plan highly considered all the facilities to be combined in one major mass, butting up against the harsh environment, and preserving the rest of the land for the natural beauty, while maintaining the continuity of street paths.

6.4.1. Urban form

In response to the conditions of stressed climates, the village pattern followed the rules of compactness, providing for a possible extension which is far advantageous, as the project location can then be accommodated by adding new facilities to the existing pattern without disturbance.

Table 1. Summary of the advantages of the compact form.

Planning issue	Advantages of the compact form
Climate	*Meets the problems of stressed climates which imply intensive radiation, diurnal changes in temperatures, extreme dryness, cold or hot winds, and dust storms.*
Energy consumption	*Consumes less energy for heating or cooling, since they are subject to less heat exchange than the conventional city.*
Environment	*Has a minimal impact on the environment, especially the sensitive ecosystem of the arid zone.* *The dramatic decrease of public and private transportation, along with the widespread adoption of energy-free cooling systems within the urban cell will alleviate the problem of air pollution.*
Drainage and Waterproofing	*Less insulation is required due to the compactness and the fact that most of the city surfaces are sealed against water penetration, and dampness.*

Social life	*Walking encouraged and pleasant social life is anticipated due to more social contact.*
Cost	*Reduces costs of planning, construction, maintenance, operation, Infrastructure network, transportation systems, and taxes.6*

Table 1 argues how necessary it is to envisage the compactness as an integral process, which ensures that the environment is chiefly considered as a primary objective at all levels of planning for the village.

6.4.2. Detailing the Concept

The following perspectives concentrate on the composition, historical values, visual concepts, and the influences that have sucked out the Qatari architecture.

Fig. 17, Fig. 18 shows how the idea of the tent could be modified and used in shading the walkways using different shapes, colors and patterns.

Fig. 21, Fig 22 demonstrates the extensive use of sculptured walls to provide shade on the

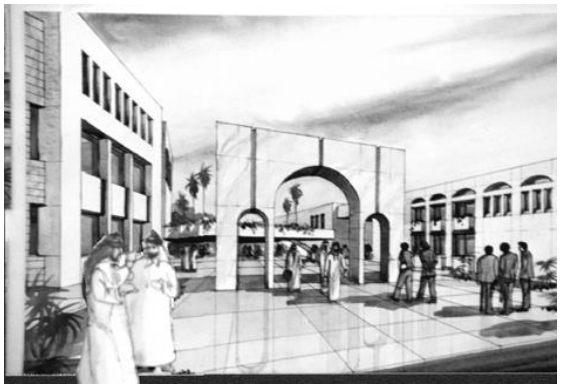


Figure 16 The use of tents to create a shade paths

Figure 17 The use of Padjir as a landmark

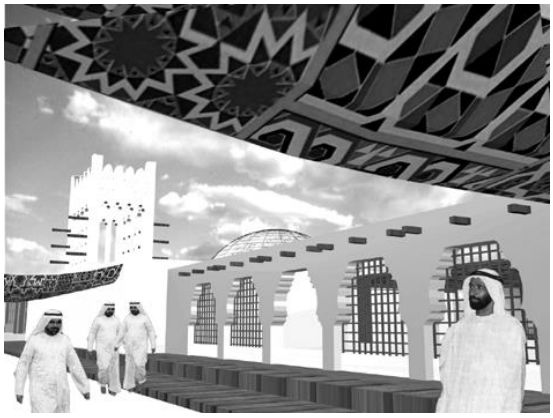


Figure 18 traditional details applied

Figure 19 The use of old ornaments in new designs

Figure 14 The Use of gates to separate the spaces

Figure 15 The use of gates to put the scale

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