

# Timeless Heritage Meets Modern Elegance: A Comparative Study of Al Fahidi and Salmaniah Architecture

Yasmeen Gul<sup>1\*</sup>

<sup>1</sup>Assistant Professor at the College of Architecture and Design, Prince Sultan University, Riyadh, Saudi Arabia.

**Abstract.** This study presents a comparative analysis of two distinct native neighborhoods, Al Fahidi Historical Neighborhood in Dubai and the Salmaniah architectural heritage of Saudi Arabia. Both regions are deeply rooted in cultural traditions and architectural brilliance, showcasing unique responses to their respective climates, societal needs, and historical contexts. Al Fahidi, characterized by its wind towers, narrow alleyways, and coral-stone buildings, reflects the vernacular architecture of Dubai, emphasizing environmental adaptability and social interaction. In contrast, Salmaniah architecture in Saudi Arabia, particularly in its historical neighborhoods, embodies intricate designs, mudbrick construction, and a focus on privacy aligned with Islamic traditions. This analysis explores their urban layouts, construction techniques, material use, and cultural significance, shedding light on the interplay between environmental factors and cultural identity. By juxtaposing these two architectural paradigms, the study highlights the shared principles and unique innovations that define the architectural heritage of the Arabian Peninsula. This comparison contributes to a broader understanding of sustainable urban development inspired by traditional design principles in contemporary contexts. **Keywords:** Al Fahidi, Salmaniah Architecture, Traditional Architecture, Cultural Heritage, Urban Development, Climate Adaptation, Architectural Identity.

## 1 Introduction

This comparative analysis focuses on Al Fahidi Historical Neighborhood and Salmaniah architectural developments, examining their approaches to sustainability, climatic adaptability, and cultural expressions. Both developments provide valuable insights into traditional and modern architectural practices in response to environmental and social contexts.

This study employs a comparative analysis methodology to explore sustainable urban design principles in two key architectural developments in the Gulf region: Al Fahidi Historical Neighborhood in Dubai, UAE, and Salmaniah architecture in Riyadh, Saudi Arabia.

The research investigates how these developments address sustainability through building orientations, energy performance, and material use.

The rationale for selecting these sites stems from their contrasting historical and cultural contexts—Al Fahidi as a preserved historical neighborhood reflecting traditional Emirati design and Salmaniah as a representation of traditional Najdi architecture in Saudi Arabia.

### 1.1. Al Fahidi Neighborhood

Al Fahidi represents Dubai's traditional lifestyle and vernacular architecture from the mid-19th century to the 1970s. The area is characterized by its use of Barajeel (wind towers) for natural ventilation, which demonstrates an adaptation to the hot and arid climate [1].

The structures are built with local materials such as stone, gypsum, teak, and palm wood [2]. The neighborhood's design includes narrow pathways and open squares that foster social interactions and provide natural cooling. Due to

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\* Corresponding author: [yasmeengul9@gmail.com](mailto:yasmeengul9@gmail.com)

its strategic location near Dubai Creek, Al Fahidi historically played a key role in Dubai's commercial activities [3]. Presently, it serves as a hub for cultural and artistic events, housing museums, galleries, and creative workshops.

## **1.2.Salmaniah Riyadh**

Salmaniah architecture, rooted in Saudi Arabia's Najdi tradition, emphasizes climate-responsive design and social cohesion [4]. Thick mudbrick walls and small windows provide insulation against extreme temperatures, while narrow streets create shaded areas that enhance thermal comfort [5].

Central courtyards in homes serve as private, multi-functional spaces that promote air flow and maintain a cool environment. This layout reflects a strong sense of community and privacy, central values in Saudi culture [6]. Modern adaptations of Salmaniah architecture maintain traditional aesthetics while incorporating advanced materials and technologies for sustainability [7].

## **2 Research Aim,**

How do the architectural elements of Al Fahidi and Salmaniah reflect adaptations to climatic conditions, traditional design principles, and cultural-social values, and what lessons can be drawn for sustainable architectural practices in contemporary urban development?

## **3 Research Design**

A qualitative, comparative approach was adopted to examine the sustainability strategies employed in both developments. Data were collected from literature reviews, field observations, and secondary sources to analyze architectural design, material usage, and energy efficiency.

### **3.1.Key Indicators**

The study selects seven key indicators based on their relevance to contemporary sustainable architecture practices. These indicators were chosen because they reflect critical aspects of environmental responsiveness, energy efficiency, cultural preservation, and user comfort—elements that are increasingly emphasized in global sustainability frameworks.

By focusing on these dimensions, the study aims to evaluate how traditional architectural elements in Al Fahidi and Salmaniah align with or diverge from modern sustainability standards. Clarifying the rationale behind this selection not only enhances the credibility of the comparison but also ensures that the findings are applicable to future architectural practices and policy development:

- 3.1.1. Urban Layout
- 3.1.2. Architectural Features
- 3.1.3. Building orientations
- 3.1.4. Climate Adaptation
- 3.1.5. Building Materials
- 3.1.6. Cultural Significance
- 3.1.7. Contemporary Use:

### **3.2.Methods Used to Collect the data**

- 3.2.1. Literature Review: Academic articles, government reports, and sustainability guidelines were reviewed.
- 3.2.2. Field Observations: On-site visits were conducted to document architectural elements and urban layouts.
- 3.2.3. Comparative Analysis: Data was systematically compared to identify similarities and differences in sustainability strategies.

## 4 Results/ Discussion

**Table 1.** A Combative analysis of AlFahidi, Dubai and Salmaniah Architecture, Riyadh

Feature	Al-Fahidi Neighborhood, Dubai	Salmaniah , Riyadh
Urban Layout	Buildings aligned side by side, separated by alleys and public spaces, open Squares	Clustered housing with internal courtyards
Architectural Features	Wind towers (Barajeel), narrow alleys, public squares	Mashrabiya, carved doors, central courtyards
Building orientations		
Climate Adaptation	Wind towers for natural ventilation/ Passive cooling techniques, use of Barajeel (wind towers) for ventilation/	Courtyards for air circulation and cooling Thick walls for insulation, narrow streets for shading, and central courtyards for airflow/
Building Materials	Stone, gypsum, teak, sandalwood, palm wood, fronds	Mud brick, adobe, stone, and palm wood
Cultural Significance	Reflects Dubai's trading heritage and communal lifestyle	Embodies Riyadh's traditional urban-ism and social structure
Contemporary Use	Art galleries, museums, cultural events	Restored for tourism and cultural preservation

### 4.1.Urban Layout

The comparative analysis method was applied in this research between two developments in UAE and other one in Riyadh, Saudi Arabia. Both developments are famous due to their sustainability in terms of building orientations, energy use, and material usage. The two developments have two different approaches as Al-Fahidi is an old community in UAE, The coordinates of **Al Fahidi Historical Neighborhood** in Dubai are: **Latitude:**25.2637°, **Longitude:** 55.2972° E. This area is located along the Dubai Creek in the Bur Dubai district. In this architectural style local materials, building orientation and energy used was taken into account according to that period according to the climatic conditions of that region on the other hand in Salmaniah the architectural style, building orientations, and materials were used according to Saudi climate and culture. The comparison summary is given above in Table 1. Al-Fahidi Historical Neighborhood strongly reflects the traditional and indigenous style of life that was paramount in Dubai from the mid-nineteenth century until 1970s. “Barajeel” are the structures that having higher air towers, mostly made from conventional structure materials, mainly consist of plam wood, fronds, sandalwood, stone, gypsum and teak. The neighborhood is isolated by rear entryways, pathways and open squares, which give the area unique characteristics with an excellent urban organization. Dubai Creek (Khor Dubai) have significant position to develop and arrange its commercial relationship with other countries. Nowadays, the present neighborhood buildings are utilized in various social and creative activities that are extending from workmanship displays, very specific historical centers, social and commandig social orders, shelter to social focuses. Additionally, this area hosts numerous social and aesthetic events, including art fairs, artists-in-residence programs, and heritage weeks, in addition to religious, cultural and national celebrations, The **Salmaniah** neighborhood in Riyadh, Saudi Arabia, is located at approximately, **Latitude:** 24.6985° N, **Longitude:** 46.7091° E, These coordinates place the district just north of central Riyadh, adjacent to notable areas such as Al Olaya and King Fahd Road. The urban layout of Salmaniah architecture in Riyadh reflects a blend of traditional Islamic design principles and modern urban development. This area, one of the key historical and cultural districts in the city, plays an important role in Riyadh's development, bridging the past with contemporary influences. Unlike Riyadh's newer developments that follow strict grid patterns, Old Salmaniah evolved organically before modern urban planning initiatives shaped its current layout. Over time, it adopted a mix of narrow streets and wider arterial roads. Public squares and mosques served as gathering points for the community and narrow alleys and interconnected pathways fostered neighborly interactions. Early Salmaniah combined homes with family-owned shops and businesses. Small local souqs provide daily essentials to residents. Old Salmaniah reflects a transitional phase between Riyadh's traditional villages and modern districts. The district still showcases early 20th-century urban planning styles, blending traditional Saudi Arabian architecture with emerging global influences. Typical homes featured large central courtyards, which offered shade and privacy while improving ventilation. Shaded balconies and wooden screens were common for maintaining privacy and controlling sunlight. One or two-story buildings were the norm. In sum, the urban layout of Salmaniah architecture in Riyadh serves as a reminder of the city’s rich history while simultaneously embracing modernity. The careful balance of tradition and innovation in urban planning continues to shape the district’s identity, making it an important cultural and architectural hub within Riyadh. So finally, we can say that the difference in both types of

layouts is the courtyards systems. In AlFahidi neighborhood the house has open square outside also on the other hand the house had boundary wall and inside courtyards are the more dominant in Salmaniah architecture.

#### 4.2. Architectural Features:

The architectural feature of AlFahidi is the wind catcher which were not only used to catch Sea winds but also became one important feature of their architecture. On the other hand, the architecture often includes decorative elements like intricate wooden window screens (*mashrabiya*), carved doors, and ornate ceilings in both architectural styles. These features not only enhanced aesthetic appeal but also served practical purposes, such as providing privacy and facilitating ventilation. Al Fahidi, Dubai, the architectural orientations of Al Fahidi Historical Neighborhood in Dubai and Salmaniah in Riyadh are deeply influenced by their respective climates, cultural contexts, and historical developments. The architectural features are for Al Fahidi, were Southwest towards the Qibla, the direction of the Kaaba in Mecca. This orientation is opting only for religious consideration but also a response to the local climate. Secondly narrow, windy streets and alleys, along with the use of Wind towers (*Barajeel*) are strategically placed to capture prevailing cool winds, enhancing ventilation and reducing the need for artificial cooling. The details of Salmaniah architecture were Traditional Salmaniah homes are typically organized around central courtyards. This design facilitates natural ventilation and provides a private outdoor space shielded from the harsh desert environment. The urban fabric often features narrow streets and alleys, which create shaded pathways and reduce exposure to direct sunlight, contributing to a cooler micro climate. Buildings are oriented to provide privacy and to minimize direct sun exposure, with windows and openings positioned to optimize natural light and ventilation while maintaining seclusion. Early homes were built with adobe (clay and straw) before concrete became common. These were often used for nighttime gatherings and sleeping during hot summers. Geometric patterns in doorways, window frames, and arches were common

#### 4.3. Building Orientations and layout

To assess the influence of building orientation on sustainability, the study analyzed spatial layouts and structural positioning. As noted by Morrissey [8], "the meaning of the orientation of a building rests on the required goal." The investigation considered how building orientations in Al Fahidi and Salmaniah respond to climatic conditions for thermal comfort and natural ventilation. Building A, B, C, D, and E follow an overall orientation aligned with their axis of elongation. However, for buildings B, C, D, and E, multiple possible local orientations differ from the general one. Buildings F, G, and H present challenges as they lack a distinct orientation, making rotation during generalization problematic. Building I have no definite orientation, illustrating the complexity of defining a universal building orientation. Building orientation involves two key aspects:

General orientation represented the building's elongation while wall orientation related to the alignment of parallel walls across different structures. Orientation plays a crucial role in daylight penetration and shading therefore South orientation provides effective solar gain in winter, reducing heating loads. Overhangs shade windows during summer, limiting cooling loads. Similarly East/West orientation During winter, solar gain is minimal compared to south-facing windows, increasing heating loads. In summer, solar gain is higher, leading to greater cooling demands. At the same time, through North orientation Solar effects are negligible year-round, with minimal cooling or heating impact. Overall, south-facing windows are most energy-efficient, offering 12-20% load savings compared to other orientations. East and west orientations contribute minor solar gains in winter and minimal thermal discomfort during summer, with total load variations of less than 3% compared to north-facing structures.

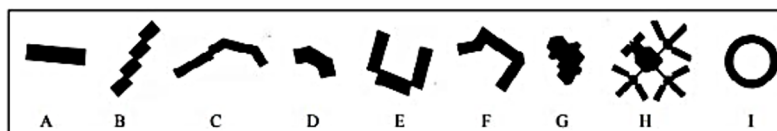


Fig. 1. Building orientation in Alfahidi

#### 4.4. Climatic adaptation:

The climatic adaptation in AlFahidi was through design elements, cooling strategy, material use and shading which are narrow alleys, wind towers (*Barjeel*), and thick walls. Wind towers capture and direct cool breezes into interiors, while thick walls provide thermal insulation, reducing heat gain. Locally sourced materials such as stone, mud, and gypsum help moderate indoor temperatures. Courtyards and shaded pathways minimize direct sunlight exposure.

On the other hand, the climatic adaptation in Salmaniah represents a transitional phase between traditional and modern architecture in Riyadh. It retains some elements of traditional design while incorporating early modern urban concepts. Courtyards in residential buildings for airflow and natural cooling. Verandas and shaded balconies to reduce heat exposure. Thick walls to minimize heat transfer. Small windows to reduce direct sunlight penetration. Incorporation of trees and green spaces in some residential areas for cooling and shade.

#### **4.5. Materials and Construction:**

Locally sourced materials, including stone, gypsum, teak, sandalwood, and palm wood, were traditionally employed for their thermal properties [9]. On the other hand, natural materials such as mud brick, adobe, stone, and palm wood were used to construct homes, leveraging their insulating properties and availability [9].

#### **4.6. Cultural Significance**

Al Fahidi is One of the oldest neighborhoods in the region, it embodies traditional Gulf architecture, social structures, and Emirati cultural values. Courtyard houses foster close-knit social interactions and communal activities. Home to museums, galleries, and heritage festivals that celebrate art, crafts, and Emirati traditions. Reflects the sustainable and resourceful lifestyle of early Arabian communities before the advent of oil-driven modernization. Similarly houses in Old Salmaniah blend traditional elements with early modern designs, symbolizing Riyadh's evolution during the 1970s and 1980s. The neighborhood attracted intellectuals, business elites, and expatriates, fostering a cosmopolitan social environment. With diverse residents and a mix of traditional and modern amenities, Salmaniah became a melting pot for progressive cultural trends in Riyadh. Both neighborhoods hold distinct importance: Al Fahidi preserves the roots of Gulf culture and traditions, while Old Salmaniah represents Riyadh's modern growth and social transformation.

#### **4.7. Contemporary Use**

Both districts have successfully adapted to modern demands, serving as vibrant hubs for culture, tourism, business, and lifestyle while retaining their unique historical significance.

### **5 Conclusion**

In conclusion, while both Al-Fahidi and Salmaniah showcase traditional Arabian architecture, Al-Fahidi's design is distinguished by its wind towers and narrow alleys, reflecting Dubai's coastal environment and trading heritage. In contrast, Salmaniah's architecture emphasizes central courtyards and decorative elements, highlighting Riyadh's desert climate and social structures.

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