

Traditional Najd Architecture

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The research focuses on the architectural typologies and the architectural elements of the cultural heritage in the Najd region. Najd is the great central plateau of Saudi Arabia, of which Riyadh is the most important city and the capital. The contribution leads the architects to rethink the constructive and aesthetic approach in designing and constructing new architectures without forgetting the culture and historical context of reference. The expressiveness of architectural language in terms of the formal and aesthetic approach is a feature that should not be secondary in contemporary buildings. The surface, texture, form, representation, and expression should prevail over aesthetic purposes in architecture.

cultural heritage

aesthetic approach

cultural identity

Najd Architecture

1. Introduction

In recent years, Riyadh, one of the fastest-growing cities in the Middle East, has been facing many changes in urban planning and the construction sector. Several mega projects are currently underway that will revolutionize the city, leading to the renewal of different areas, from historical ones rich in cultural heritage to the transformation of vacant lands, i.e., sites available for future residential and commercial developments within the city ^[1]. These new projects will profoundly affect the way spaces are experienced and local culture is perceived through architecture. The adoption of Western models, foreign to the Saudi cultural reality, has led the construction process of buildings lose its traditional values. The architectural styles of buildings reflect how people adapt to their local environment and culture, contributing to the transmission of social norms and order ^[2]. Therefore, there is a need to preserve and pass on traditional architecture to new architecture to stay in line with the strategic framework of Saudi Vision 2030. This strategy aims to strengthen the cultural aspects of the Kingdom through architectural design. The aim is to support the vibrant culture of Saudi Arabia by trusting its past and looking to the future by unleashing new and stimulating expressions of form for new contemporary buildings ^[3]. Unfortunately, while some new policies, guidelines, and research are underway to address the challenge of conserving cultural heritage, little attention has been paid to its cultural and economic significance to date. Additionally, this stems from the fact that people have mainly focused on environmental issues rather than cultural ones, following the substantial concerns about climate change influencing the built heritage ^[4]. Contemporary architecture has therefore accelerated the traditional loss of identity. One must consider the elements that characterize the local culture to aim at constructing technologically sustainable buildings. UNESCO (United Nations Educational, Scientific and Cultural Organization) is committed to unleashing the power of culture to achieve its 2030 Agenda. Indeed, it affirms that no development can be considered sustainable without including the “culture” and the “full integration of culture into sustainable development policies.” Building design should respect the environment and create an architecture that integrates

local identity with the design process [5]. Therefore, the design of new buildings will have to guarantee the identity and collective memory of the place by communicating with the surrounding fabric [6].

2. Historical Typology and Compositional Aspects

From the analysis of the buildings of traditional Najd architecture, architectural typologies emerged that are firmly rooted in the territory. The composition and arrangement of the masses and the materials used derive from the way of life of the local population, their culture, their lifestyle, and the arid climate. The main compositional and morphological aspects of traditional architecture in the Najd region are listed below.

Firstly, the research focused on the urban fabric, identifying an urban fragmentation with irregular housing typologies separated by narrow streets. This irregularity of the urban and building fabric is typical of Najd architecture and certainly comes from the warm climate to create more shading between the buildings. Emblematic is the UNESCO World Heritage Site of At-Turaif District in ad-Di'riyah, often known as "Historic Diriyah", located northwest of Riyadh in Wadi Hanifa Valley. The city of At-Turaif (**Figure 1**) was the first capital of the Saudi dynasty founded at the beginning of the eighteenth century. "The citadel of at-Turaif is representative of a diversified and fortified urban ensemble within an oasis. It comprises many palaces and is an outstanding example of the Najdi architectural and decorative style characteristic of the center of the Arabian Peninsula. It bears witness to a building method that is well adapted to its environment, to the use of adobe in major palatial complexes, along with a remarkable sense of geometrical decoration" [7]. At-Turaif District features a sizable urban fabric that illustrates Najd architecture's distinctiveness and uniqueness of urban design [8].



Figure 1. Urban fabric of the historic center of At-Turaif District, Riyadh (Source: Google Earth).

The Historic Diriyah exemplifies how people can adapt to living in a hot and dry environment within introverted housing typologies. The typical Najd house has a courtyard typology, with the living spaces built around a central space, be it an atrium, a patio, or a courtyard [9]. The central area takes on various geometric configurations, usually in the shape of a square or rectangle. The courtyard has a dual function: it is the fulcrum of family life in the house and acts as a light well and airshaft to reduce the temperature during the hot hours of the day and cool the rooms to make spaces more livable and comfortable. The courtyard, therefore, represents an important typology for bringing nature into the Najd houses (Figure 2) [10][11].

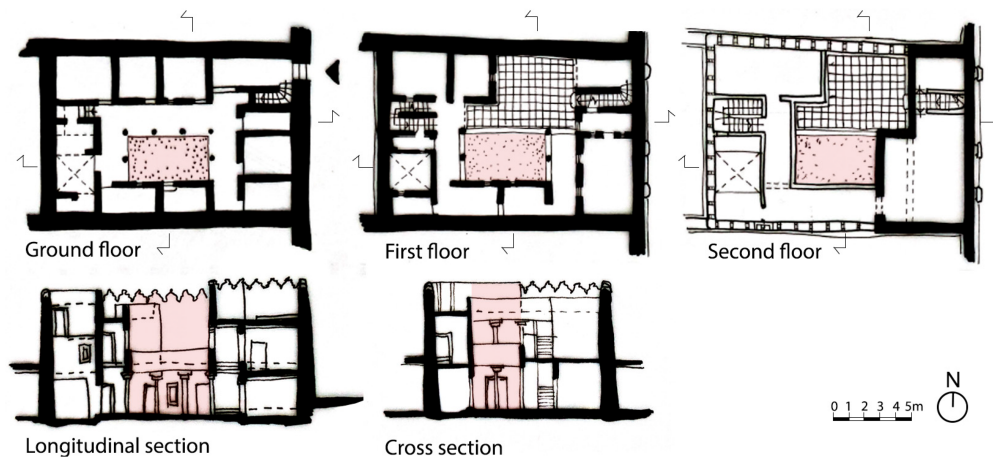


Figure 2. A typical Najd house: courtyard typology (Source: author).

Within the city's urban fabric, many houses are aggregated together. Each home has one or more courtyards to guarantee more privacy and open spaces and takes advantage of the air flows to offer optimal microclimatic functionality. The house's walls are, in fact, of a certain thickness to better isolate the interior spaces. The aggregation of the houses creates a cluster of buildings divided by narrow spaces for connection and the movement of people [12].

Subsequently, this research focused on the historic center of Ad Dirah, whose origins can be traced back to 1737. The neighborhood is today a popular tourist attraction as it hosts several historical and traditional landmarks of Najd Architecture, such as the valuable historical typologies of Al Masmak Fortress and the oldest part of the main traditional market, the Souq Al Zel (Figure 3).

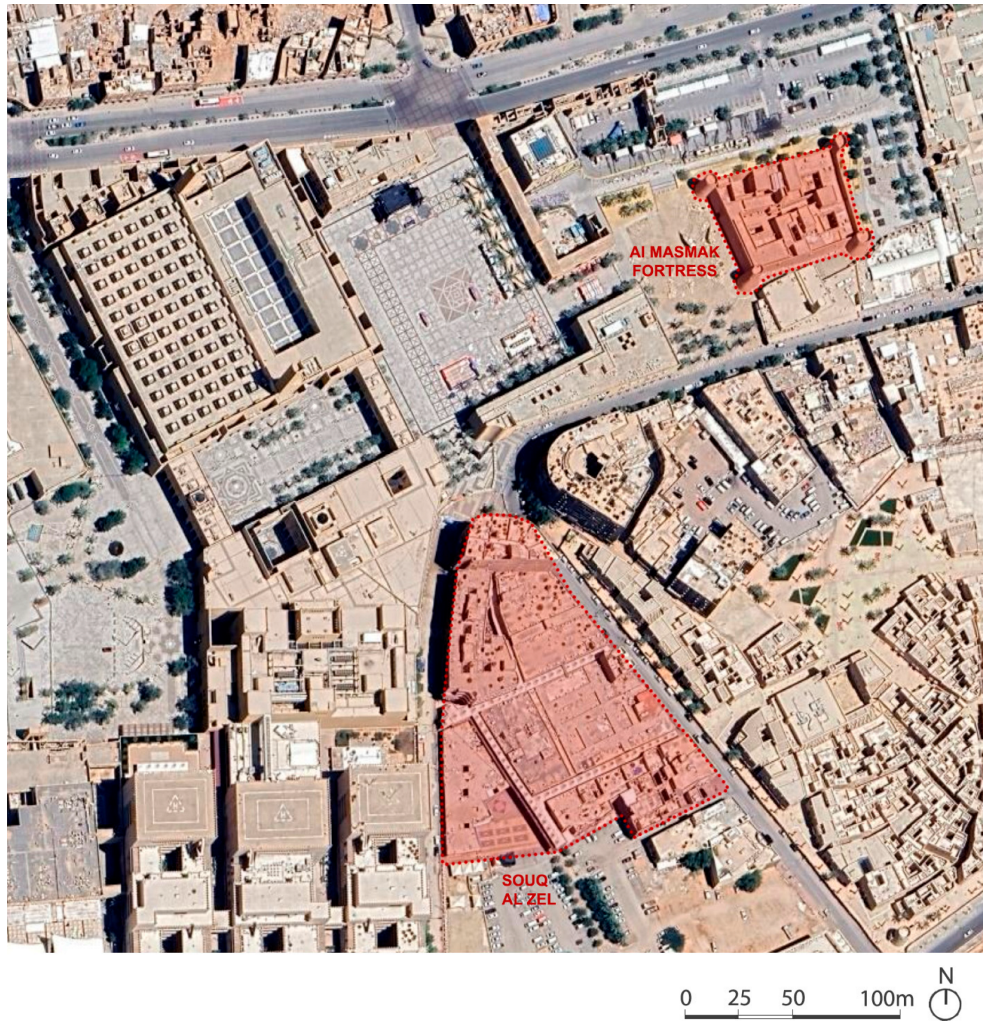


Figure 3. Historic center of Ad Dirah, Riyadh: Al Masmak Fortress and Souq Al Zel (Source: Google Earth with Author elaboration).

The Al Masmak Fortress, located in the historic commercial center of Ad Dirah, is an important symbol of Saudi unification (**Figure 4**). The palace, now transformed into a museum, still preserves today the characteristics of Najd architecture, from its architectural form to the Najd elements that characterize its facades [13]. Al Masmak is a significant example of a defensive structure with a rectangular plan. The spaces are distributed along the perimeter and around the courtyards (**Figure 4a**). A porch acts as a transition space between the rooms and the various open courtyards of different shapes and sizes, which take up the architectural typology of the courtyard house, an introverted typology due to its original defensive function (**Figure 4b**). Here, too, the courtyards help to facilitate the lighting and ventilation of the spaces along the perimeter. The defensive towers at the four corners characterize the facades, and thick mud walls are the characteristic material of the native architecture [14][15].

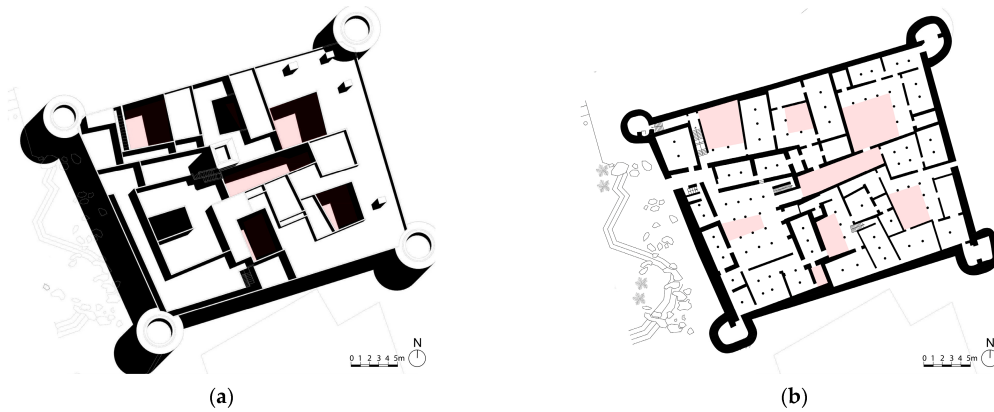


Figure 4. Al Masmak Fortress (Source: Drawings of the students of Architectural Design II, A.Y. 2022-2023, supervised by the author): (a) Top view showing the different courtyards inside the defensive walls; (b) ground floor showing the several spaces around the open courtyards.

Another architectural typology that characterizes the historic center of Ad Dirah is the traditional Arab market. Souq Al Zel, Riyadh's old market in the heart of the city, covers an area of 38,000 square meters. It is one of Riyadh's oldest traditional markets, carrying 100 years of history in its narrow streets (**Figure 5**). Therefore, Souq's morphology is an urban element where small space partitions create an economic network in the city. The labyrinthine streets are usually thin and congested with antique displays, rare coins, old tools, and interesting objects that seem to come from a museum of ancient folklore. Souq Al Zel presents a compact fabric comprising a network of primary and secondary pathways intersecting at right angles. The shops are grouped back-to-back along a common wall. The ratio between full and empty emphasizes the typology of the Souq (**Figure 5a**). Tents as shading devices are a vernacular feature on the roof of the pedestrian corridors and act as a successful local reference to other adjacent buildings in the surrounding historic area (**Figure 5b**) ^[16]. Three main plazas are covered with shading devices or open to the sky. The public plazas lead to the primary pedestrian roots, which branch into the pathways.

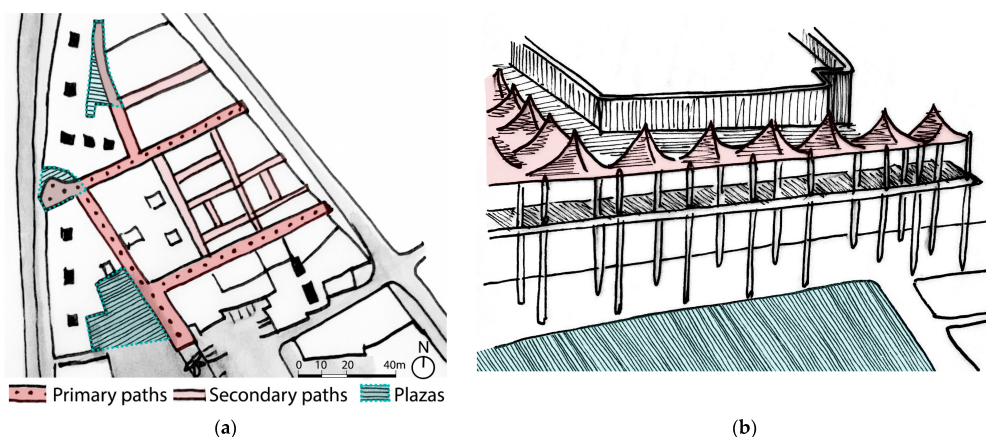


Figure 5. Souq Al Zel (Source: author): (a) Spatial hierarchy distribution of Souq Al Zel; (b) the use of tents on the roof of the pedestrian corridors.

3. The Architectural Elements of the Surfaces in Najd Native Architecture

The research identifies those architectural elements that characterize traditional buildings' facades and give them expressive value and plastic representation. The analysis reveals that the native Najd architecture reflects the climatic conditions, the local availability of raw materials that generate the form and layout of the building, and sociocultural factors such as religion, customs, and values. Therefore, the interaction between religious and sociocultural aspects, local know-how, and the natural environment combine to generate the traditional built environment ^{[17][18]}.

Various elements characterize the expressive and plastic value of the surfaces: the porous texture of the walls obtained from natural materials; the wall effervescence of the architectural element with an observation function (Tarma); the battlements at the top of the wall (Shurfat); the small openings in the walls (Furjat), and the engraved doors (Al-Bab).

- The porous texture of the walls obtained from organic materials. Given the scarce availability of stones and different varieties of trees suitable for construction, the buildings were built with mud or sun-dried bricks and finished with the application of mud plaster. The walls were very thick to isolate the interior spaces from extreme heat and to achieve greater structural integrity ^[19]. The mud bricks, composed of a mixture of water, straw, and other fibers, highlight the relationship between architectural artifice and naturalness. Straw and natural elements do not have an ornamental function, but they creep into the walls, creating efflorescence and contributing to the breakdown of the facade. The surface becomes tactile, rough, and imbued with Saudi culture and traditions. The walls become plastic, composed of the soil and the silt collected after the rainy seasons of "Wadi Hanifa," the valley in the Najd region. Furthermore, chromaticity plays a vital role in architectural constructions; the color of the earth, of the clayey soil, is the dominant color of the native architecture in Saudi Arabia. It almost seems that buildings shaped by the force of nature arise naturally from the ground as an integral part of the environment (**Figure 6a**).
- The wall effervescence of the architectural detail with an observation function (Tarma). A pronounced architectural element called Tarma characterizes the facade of the buildings, accentuating the porosity of the surfaces. It is usually arranged on the second floor and above the door. It works as a "peephole" to observe people outside the door of the building without being seen inside ^[20]. The Tarma of different shapes and sizes also has symbolic value, as it helps users of the urban space to identify the building and its entrance through the various forms of the element. It is interesting to note how the size of the interior spaces and the width of the street the building faces affect the size and shape of the Tarma. The relationship between symbol and ornament is inseparable from the local culture (**Figure 6b**).
- The battlements at the top of the wall (Shurfat). The hand-molded and layered walls are tapered upwards and finished in a crenelated shape. These decorative elements in the form of triangles or arrows, sometimes alternating between full and empty, create a proportional rhythm by acting as a parapet for the rooftop and, in

turn, protecting the facades from rainwater. It is customary to find a horizontal strip engraved in the wall under these elements, with triangles underneath, always upside-down, as protection from rainwater (**Figure 6c**).

- The small openings in the walls (Furjat). The walls are often pierced with small rectangular or triangular openings, a feature of the Najd architectural style, to promote adequate air movement, lighting to the interior spaces, and the view from inside to outside. These small openings do not have a purely decorative function but are arranged vertically, horizontally, or in stacks, creating a pattern on the facade with different dispositions and densities [21]. The different arrangements of the openings meet the different socio-cultural needs of the population while preserving the technical and environmental characteristics [22]. The alternation of irregular openings of different shapes and sizes infuses the building with rhythm, lightening its visual weight by breaking up the facade's composition and bringing out its expressive value. The result is a building that expresses an apparent simplicity and lives of a suggestive rhythmic cadence, capturing the observer's eye (**Figure 6d**).
- The doors (Al-Bab). The traditional Najd doors function as an access element to the building and are very particular in design. They are usually square in size, single-sided made of wood or palm trees. Some entrance doors are colored, engraved, and painted with geometric motifs, embellished with repetitive designs of a symbolic nature, and very pleasant in style and composition. The door and its visual features, use of color, and ornamentation support non-verbal communication by guiding the visitor to the building [23]. This element is an essential visual element to guide the local population and identify their position (**Figure 6e**).

In summary, **Figure 6** provides an overview of the five main features that characterize the surfaces of the building's "skin" in Najd architecture.



(a)



(b)



(c)



(d)



(e)

Figure 6. Architectural features of Najd architecture (Source: author): (a) The porous texture of a wall in Rughabah village, north-west of Riyadh; (b) the element of “Tarma” on the facade of Al Masmak Fortress; (c) the “Shurfat” element in the Murabba Historical Palace, Riyadh; (d) the “Furjat” openings, At-Turaif District in ad-Di’riyah, Riyadh; (e) the “Al-Bab” traditional Najd door in Ushaiger village, north-west of Riyadh.

4. Conclusions and Future Perspectives

This research on the historical typologies and the expressiveness of the elements of the traditional Najd architecture leads the architects to reflect on building contemporary architecture creating continuity between past and present through the search for identity without “falsifying” history or being “identical” to tradition. Designers should be aware that a project begins by acquiring historical notions and local culture and studying the reference context’s climatic situations. The architect becomes a mediator between the physical transformation of the territory and the collective interest. Once the knowledge of the past is acquired, it will be possible to define solutions to a contemporary problem. This knowledge will provide an essential basis for integrating the principles of vernacular architecture into modern design, leading to more resilient buildings adapted to the needs of the inhabitants and local conditions ^[24].

In recent years, Western models not related to the traditional historical style have been adopted in the rapid expansion of cities in the Middle East, specifically Riyadh. These new ways slowly eliminate any diversity of styles and cultures, losing the place’s roots. The study of this research aims to contribute to Saudi Vision 2030 and strengthen the cultural aspects of the Kingdom, promoting the national identity through the renewal of cultural identity through contemporary architecture and incorporating traditional typologies, elements, and materials but from a reinvented perspective. Saudi Arabia will become one of the leading destinations for international visitors; therefore, it is necessary to strengthen the cultural identity in the design of new architectures that also respond to aspects of sustainability through the use of local resources: a combination of cultural continuity and technological progress towards a sustainable culture to achieve cultural sustainability, and an architecture that expresses beliefs, morals, and methods together ^[6].

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