sciendo

Civil and Environmental Engineering
Vol. 0, Issue 0, DOI: 10.2478/cee-2025-0079

KEYS TO INNOVATIVE HOUSING DESIGN IN ARCHITECTURAL DESIGN STUDIOS: A CASE STUDY OF GREEN SCAPE RESIDENCES

Fatima Mohammed AL SUBHI[1], Mohamed Faisal AL-KAZEE[2, *]

[1] Engineer, Department of Architecture and Interior Design, University of Nizwa, Sultanate of Oman.
[2] Assist. Prof, Department of Architecture and Interior Design, University of Nizwa, Sultanate of Oman.
[*] corresponding author: faisal.kazey@unizwa.edu.om

Abstract

The demand for housing and community design development has increased in recent years. Consequently, intense competition exists for innovative housing designs that meet the necessary needs, particularly in hot, dry regions where high temperatures significantly affect people's lives. In the case of Oman, it is crucial to have a sensible design that allows buildings to adapt more effectively to the climate. The research aims to measure the keys to innovative housing design within the framework of an architectural design studio from an academic perspective. Moreover, it highlights a project's design process through various stages in an advanced architectural studio. Additionally, it describes how a designer's role is vital in proposing practical solutions to offer multiple apartment designs in a sustainable housing complex to meet the essential requirements of the community centres. In this context, the study aims to describe Green Scape Residences as an innovative housing project design included in the advanced architectural design studio. In this regard, the project is a testament to innovative housing design, including nearly 600 apartments, commercial units, restaurants, two schools, and a kindergarten. It was also categorized into various groups of blocks (high-rise, mid-rise, and low-rise blocks), each featuring different types of apartments. Furthermore, the research identified 15 keys to architectural brilliance adopted in the project's design process. Then, the 15 keys were assessed through a survey from academia and industry to identify the key elements that effectively influence the creative housing design framework. The findings of this research highlight the significant keys to innovative housing design from an academic perspective. Eventually, this will establish the foundation for developing different frameworks that enhance creative housing design principles in the architectural design studio.

Keywords:

Innovative Housing Design;
Architectural Design Studio;
Design Keys Analysis;
Framework.

1 Introduction

Architecture is a powerful medium that shapes our lives, interactions, and experiences of space. There is a growing demand for housing and community design development, particularly in innovative housing and design solutions [1]. As a result, most architecture departments and institutes prioritize this area for senior architecture students' teaching. In an Architectural Design Studio, the quest for innovative and creative housing designs is an ongoing challenge that necessitates a profound understanding of form, function, sustainability, and human-centered solutions [2]. This strategy could also be applied in advanced design studio courses, final-year project reports, and creative research activities. Furthermore, several projects could serve as pioneering case studies and examples of this approach [3]. In this context, the Architectural design process involves more than simply constructing buildings; it requires a delicate equilibrium of aesthetics, functionality, and sustainability [4]. The challenge within an architectural design studio is to create innovative housing solutions that respond to human needs, environmental issues, and shifting urban landscapes [5]. In advanced design courses, the methods and techniques differ from one institution to another due to their diverse experiences and teaching styles [6].

One of these approaches emphasizes the skills needed to create standard and functional housing designs. In other institutions, the students were requested to design and handle housing projects and community design from a different perspective [7]. The mentioned approach focused on combining the principles of the former design courses that shed light on housing design rules. The main aim of such a process was to create a sustainable and livable residential complex that integrates harmoniously with its natural surroundings while fostering a sense of community among its residents [8]. On the other hand, an up-to-date framework focuses on an actual case study project that seeks to accomplish this through thoughtful sustainable design and prioritizing natural lighting, ventilation, and green spaces [9]. One of the main challenges faced in such projects is balancing the need for density with the desire to create a comfortable and spacious living environment [10]. The design should accommodate multiple apartments while offering residents sufficient open spaces, views, and amenities. Another challenge is ensuring the project's sustainability, and fostering a sense of community within the complex can be difficult, particularly in a large-scale development setting [11]. Here, it is worth mentioning that cities are the first territorial entities to be concerned and impacted by changes in their various spatial, social, economic, political, urban planning, and environmental components [12]. Additionally, the latest trends in design approaches incorporate features that encourage social interaction, promote belonging, and cultivate a sense of belonging among residents, such as communal spaces, pedestrian-friendly pathways, and recreational facilities [13]. The research addresses an advanced framework that emphasizes the influence of several key factors on creative housing design. This framework explores 15 essential keys to achieving architectural excellence and promoting spatial quality, functionality, and innovative housing design. It is worth mentioning that Architectural Brilliance or Architectural Excellence is a term that refers to the masterful combination of functionality, aesthetics, innovation, and context in a built environment. It occurs when a design transcends mere practical needs; it inspires, challenges norms, and is a testament to creativity and human ingenuity. Additionally, it pushes boundaries and challenges conventional norms, blending form, function, and context to create spaces that speak to human creativity and ingenuity [14]. Additionally, understanding site context and materiality and integrating innovative technology and biophilic design, these principles will assist architects and students in expanding the boundaries of conventional design thinking [15]. These key factors highlight functionality, design conception, aesthetics, sustainability, adaptability, and flexibility [16]. Other significant keys are safety, security, contextual integration, efficient space, material selection, healthy environment, open spaces, green spaces, and the final project presentation. The Green Scape Residence was one of the pioneering projects selected for this scientific study to explore the creative housing design framework. Overall, the approach in the case study aims to address these challenges through innovative design solutions prioritizing sustainability and livability [17]. The students in such a framework are expected to make fundamental design decisions to address the public sector's social, sustainable, and economic aspects within the intended keys of Architectural Brilliance [18]. In addition, the proposed framework requires the designer to use written techniques followed by drawn ones to create comprehensive reports that reflect the background studies, site functions, feasibility, and environmental factors issues [6]. All these aspects were analyzed according to the existing site conditions to reflect the new design brief. Additionally, the drawing technique in these new approaches seeks to create the necessary housing design diagrams and develop solutions for various challenges and different design concepts [11]. By mastering these principles, designers can create visually striking homes and spaces that enhance livability, efficiency, and long-term sustainability [19, 20]. Whether you are a student tackling your first housing project or an experienced architect seeking new inspiration, these insights will provide a foundation for innovative residential and community design.

2. Methodology

The research investigates a framework for creative housing design in an architectural design studio. This framework primarily relies on 15 key elements of architectural brilliance during the design process within the architectural design studio. As shown in Figure 1, the research framework, as a qualitative method, was divided into several steps, starting with defining the problem, data collection, and describing the project progress with the outcomes of the academic project, while identifying the different stages of the design process. Then, 15 keys to Architectural Brilliance were identified and assessed through a survey distributed to academics and professionals. Finally, highlighting the main factors that enhance creativity in housing design within advanced architectural design studios. In the initial stage, there is a profound description of what the student did and the outcomes of the academic project, more than a classical scientific paper. In this context, the method structure presents the design

process of the Green Scape Residences during all stages of the project development, from the data collection, site visits, analysis report, conception, schematic plans, detailed plans, design development, sections study, elevations, pre-final, and final presentation. Then, a comprehensive survey was designed for the 15 keys of Architectural Brilliance that have been considered and applied in the case study. This survey was disseminated to 45 architecture academicians and experts from the industry. The main objective of this survey is to evaluate the 15 keys of creative housing design. Moreover, these questions will provide an overview of these factors that influence housing design from different perspectives. Finally, the analysis of the survey responses will provide a clear indicator of the applied learning level and the design outcome of the Green Scape Residences project. Additionally, it will examine the relevant framework concerning the 15 factors and the design process. Ultimately, this will lay the groundwork for creating an advanced framework that improves the creative housing design principles within the advanced architectural design studios.

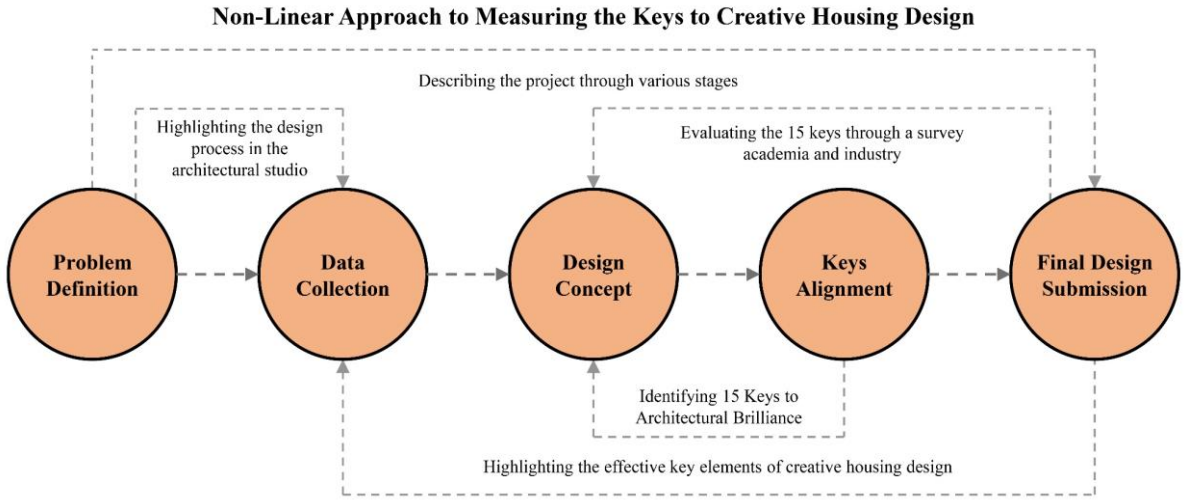

Fig. 1: Research method.

3. Design process

Based on the proposed methodology, the study and analysis started to collect all the aspects and details about the designated area and project type. The case study report aimed to explain housing projects' various problems and challenges. Another significant aim of this report was to compile all the factors and establish a knowledge-based process considering the keys to architectural excellence and innovative housing design [21]. The main requirements for the project are 600 residential units divided into eight blocks of mixed-use (low-rise, mid-rise, and high-rise), two elementary schools, a kindergarten, a hypermarket, and 600 parking spaces. Some amenities include swimming pools, gyms, plazas, sitting areas, coffee shops, and restaurants. The study was conducted at the beginning of February 2023, coinciding with the SPRING academic semester. Here, it is essential to mention that the guidelines and principles followed were standard to meet the proper design level and establish a knowledge platform for further experiences [22]. Furthermore, to achieve the intended outcomes of this process, the students were given an actual functional program to meet the study's objectives. The project was designed to be an innovative housing project in the Barka region, which was the selected approach given as an actual project on an appropriate site. It is worth mentioning that the presented case study can be interpreted in the context of architectural issues, which deal with the housing design in hot arid regions like the GCC climate. In other words, the architecture of the GCC region, such as Oman, will differ due to its climate, leading to suitable design decisions and applied strategies in the Green Scape Residence. Furthermore, the principal concept for this housing design studio should show why it is relevant to innovative design differently in Oman. The conception can be identical and creative when it responds accurately to the unique environmental factors and site requirements. Additionally, high temperatures, strong sun exposure, humidity, dust storms, and low rainfall present significant challenges that should be considered in the design proposal. Consequently, traditional Omani housing design solutions, such as

thick walls, small windows, wooden screens, internal courtyards, flat roofs, layout, and orientation, can be utilized. On the other hand, modern housing design strategies in Oman, including passive cooling design, natural ventilation, insulation, water management, solar energy, and landscape integration, can also serve as design decisions for this innovative housing project. Fig. 2 illustrates the design process structure in five stages throughout the semester, from data collection to the final presentation and jury.

Fig. 2: Structure of the design process.

By adopting this design process scenario, the students will acquire the necessary skills by the end of the project. One of the primary skills was the conceptual and practical understanding of designing various types of apartments and blocks within the context of humanities and science knowledge [23]. Another skill was to think innovatively about designing the blocks, distributing them on-site, and making the neighbourhood liveable and sustainable. Other potential skills include professional thinking and presentation for design ideas, housing diagrams, critical thinking, and advanced design solutions. Considering the design foundation keys, the students' main task was to design a fully serviced residential neighbourhood suitable for all ages at the selected site sequentially through different stages. Additionally, proper consultations, reviews, and other evaluations supported this task. This procedure began with a case study and analysis, followed by program development and site selection, which was chosen in Barka. The second part of this process was the conceptual and initial scheme of the site, followed by several stages of development to deliver the last scheme and the final presentation, as shown in Figure 2. All project stages were subjected to deep monitoring, intensive lectures, and concentrated discussions with the supervisor to achieve the proper outcomes, the project's aims, and the final presentation. The site analysis included a study of the weather, the direction of the sun and wind, effect factors, and the surrounding area associated with the key aspects of the creative design. Moreover, the process considered for developing the project concept relies on on-site analyses and a study of housing factors and unit types [24]. Additionally, the designer created detailed designs and

studies of the lighting, ventilation, vehicle circulation, human circulation, and sustainability systems, completed the 3D model, and developed the elevations [25].

4. Results and Discussion

4.1. Major Zoning

As shown in Fig. 3, the primary functions and zones were distributed appropriately based on the existing site's human needs, social aspects, sustainable requirements, and economic factors. As illustrated in the designer sketches, the primary site zoning was developed to establish central open plazas encircled by various residential blocks. The blocks' layout and arrangement also consider creating internal courts that are partially opened to these main plazas. Fig. 3 shows the primary sketches of the different units and service facilities with the colour legend.

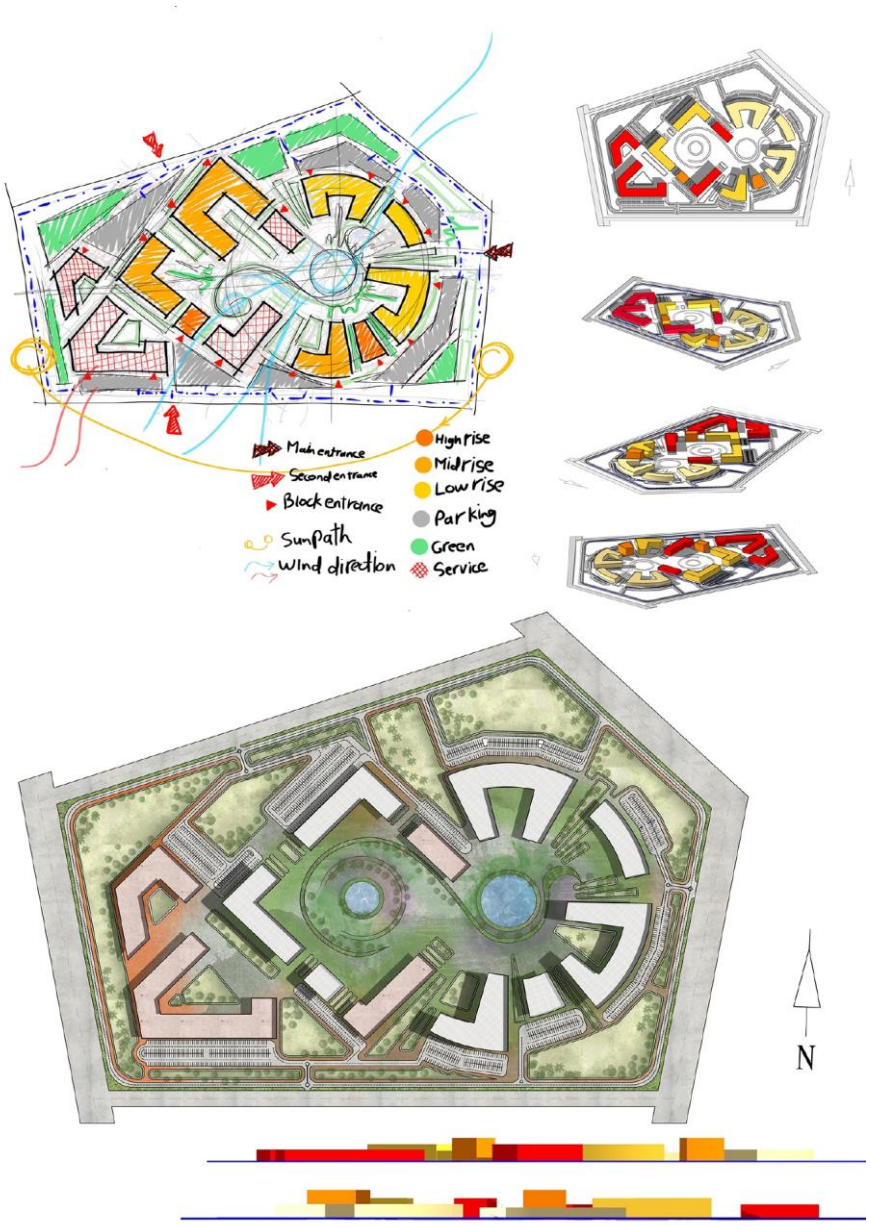

Fig. 3: Major zoning plan.

The district configuration included major facilities, such as residential housing, categorized by height (low-rise, mid-rise, and high-rise). In this regard, the blocks were designed sequentially to follow the wind circulation from lower to higher. Additionally, this facilitates commercial distribution from residential areas to nearby locations and accommodates leisure activities in the central area to serve the entire

site. The site was supported by green areas, lakes, and attractive elements to deliver luxury to this region. Moreover, service facilities were distributed with a minor percentage of retail and shopping to serve their districts. Moreover, expansive green spaces and plazas surrounded those facilities, connecting all areas to pathways for vehicles and pedestrians.

4.2. Mixed-use block

The project blocks were classified into three categories: low-rise (three floors), mid-rise (five to six floors), and high-rise or tower (eight floors). As mentioned earlier, the blocks were arranged sequentially by the wind's direction, which provided views and diminished the feeling of density. In this context, the arrangement was also made according to the number of apartments required for the project, as shown in Table 1 and Fig. 4.

Table 1. Number of blocks in terms of the height.

	Low-rise	**Mid-rise**	**High-rise**
Number of Blocks	3	2	2
Number of Floors	3	5-6	8

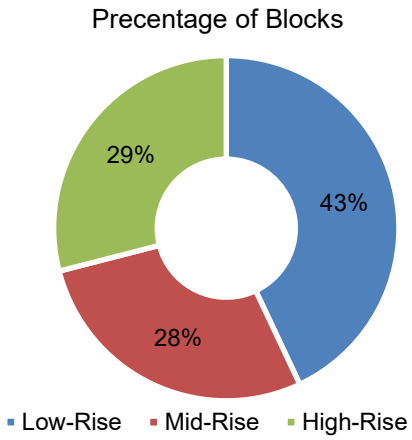

Fig. 4. Percentage of Blocks.

4.3 Apartment types

Before beginning the apartment design, the designer considered various factors related to the intended creative design principles and the site plan analysis. Additionally, detailed sketches of the blocks' layout and shapes were suggested to establish a suitable configuration for the apartment design, as illustrated in Fig. 5.

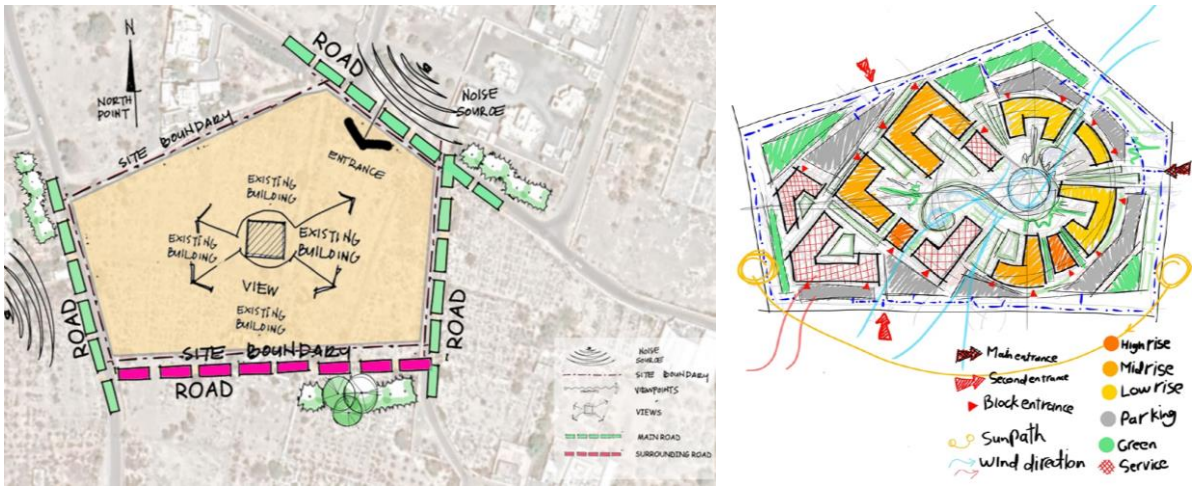

Fig. 5. Site analysis and zoning.

Additionally, the three types of units (apartments) used in the design are as follows:

1. Type A (1 BHK), covering an area of 45 m² (includes a bathroom, living room, kitchen, storage, and balcony).
2. Type B (2 BHK), 60 m² (includes a bathroom, toilet, living room, kitchen, storage, and balcony).
3. Type C (3 BHK), 85 m² (includes a bathroom, toilet, living room, kitchen, storage, and balcony).

The three apartment types (A, B, and C) were designed in appropriate layouts to meet the increasing demands in the housing sector and align with the site's block locations, as illustrated in Fig. 6.

Fig. 6: Layouts of the three proposed apartment types.

The apartment's design also emphasizes enhancing thermal comfort and indoor air quality as essential elements in modern, intelligent buildings [26]. It is worth mentioning that the number of Type B units was more than 300, as shown in Figure 7, since they are more needed than Type A and Type C units in housing complexes. Additionally, the design of the residential buildings was based on an energy-efficient and new approach to designer decision support systems (DDSS) [27]. Moreover, several engineering software and BIM Technology applications, such as Revit and Ecotect, were used to analyze the apartments' space arrangement, user comfort, and interior design [28].

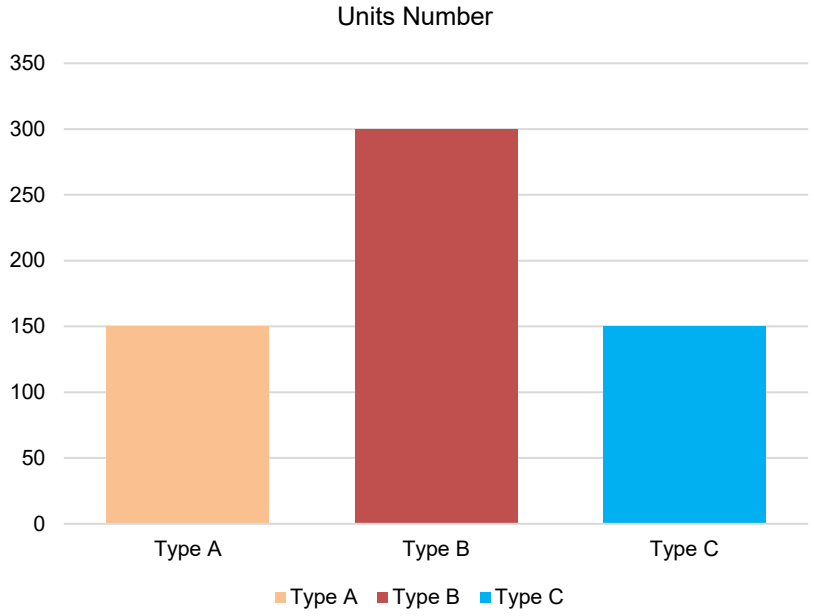

Fig. 7: The number of unit types.

Additionally, Fig. 8 shows the percentage of each type, A, B, and C, in the blocks, whether Low-Rise, Mid-Rise, or High-Rise on the site.

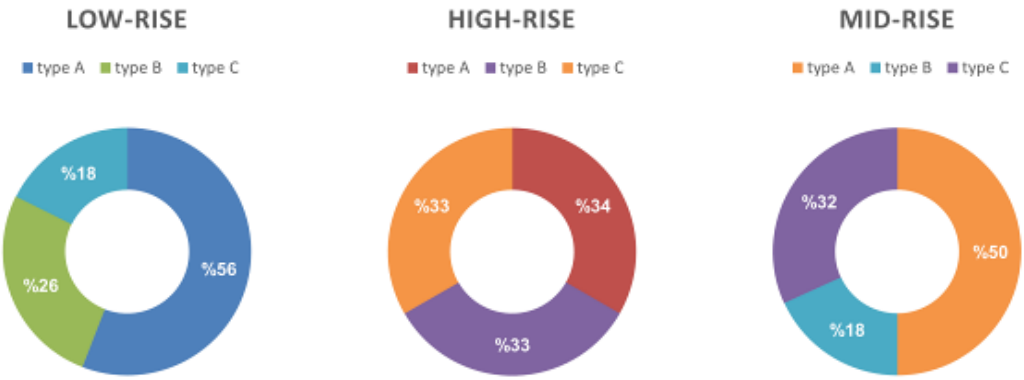

Fig. 8: Percentage of each apartment type in the blocks.

4.4. Master site plan

The site's design theme effectively met the goals by integrating key elements. Firstly, incorporating courtyards and plazas improves the building's lighting and ventilation, offering views from each block and creating a more comfortable and sustainable living environment for residents. These open spaces also serve as gathering areas, promoting community within the complex. Additionally, employing a geometric style, strong curves, and a blend of round and square shapes enhances visual interest and creates a sense of harmony in the overall design. This approach creates a pleasing and natural impression, blending the buildings seamlessly into the surrounding landscape. The geometric elements of the blocks, especially those oriented toward the courtyards, contribute to a cohesive and integrated design scheme. Overall, the design effectively merged the primary keys: functionality and aesthetics, resulting in a residential complex that is visually impressive and promotes a high quality of life for its residents. Fig. 9 illustrates the final site plan of the Green Scape Residences.

Fig. 9: Master site plan.

4.5. Plans

The plans were developed using a multifaceted approach to create functional, comfortable, and aesthetically pleasing living spaces. During the design process, various factors were considered, including the site's topography, local climate, zoning regulations, and the needs of future residents. The layout maximized land use while ensuring ample green spaces, amenities, and parking as essential elements for a healthy environment and contextual integration. The blocks were designed to enhance natural light and ventilation, while the design includes communal areas such as parks, playgrounds, and swimming pools to foster a sense of community, as shown in Fig. 10.

Fig. 10: Ground floor and first floor plan.

Sustainability was prioritized, incorporating energy-efficient design, water conservation measures, and eco-friendly materials. Additionally, building orientation, mass shading, green pockets, cavity walls, and passive ventilation were other design strategies applied in this domain. The plans

sought to establish a cohesive, sustainable, and attractive environment that improves residents' quality of life, optimizes space usage, enhances human experience, and promotes adaptability and flexibility.

4.6. Sections and Elevations

The designer prioritized developing project sections, which are essential to the design process because they offer a detailed view of how the buildings interact with the surrounding environment, as illustrated in Fig. 11 and 12.

Fig. 11: Site section.

The sections illustrated the relationship among the buildings, courtyards, and plazas and how natural light and ventilation are integrated into the site design. The design emphasized arches and curves, demonstrating how these elements enhance the overall aesthetic and functionality of the complex. Additionally, the sections are crucial for grasping how the various components of the housing project integrate, as illustrated in Fig. 12.

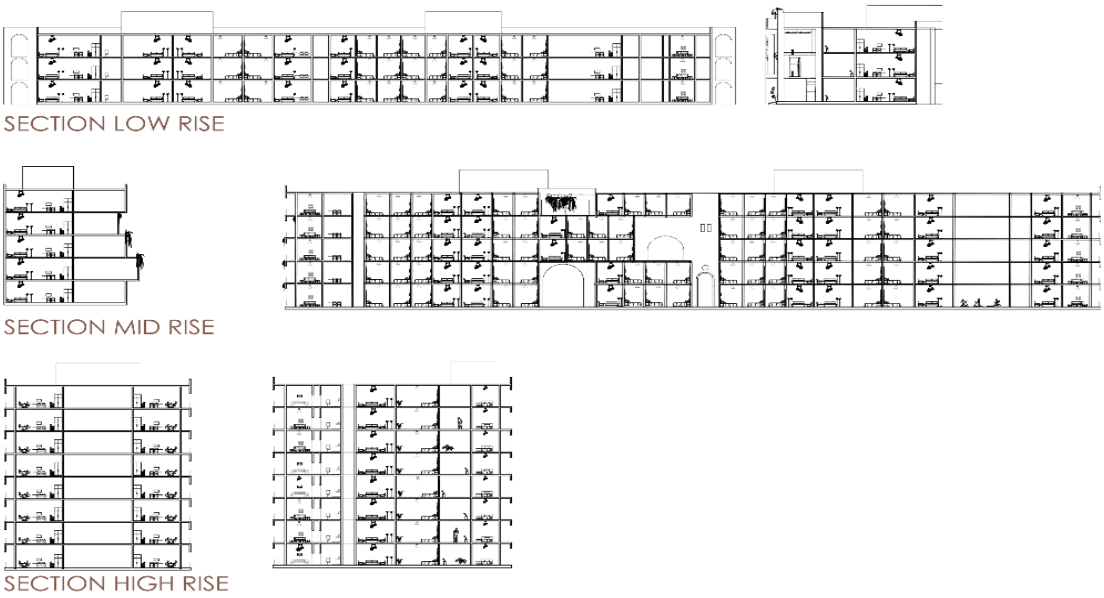

Fig. 12: Different block sections.

All the project facades adopted semicircular arches in a recurring pattern, with minor differences that distinguish each block from the others and serve other purposes, such as blending modern and traditional elements, as shown in Fig. 13 and 14.

Fig. 13: Low-rise block elevation.

First, from an aesthetic perspective, it can create a sense of harmony and rhythm, enhance visual interest and provide a cohesive appearance to the buildings. Moreover, repeating this architectural element can also give the complex a unique identity, distinguishing it from other developments.

Fig. 14: Mid-rise block elevation.

From a functional perspective, semicircular arches offer structural stability and support, especially in multi-storey buildings. These arches efficiently distribute weight, enabling larger windows and open spaces within the apartments. Moreover, these elements assist in controlling natural light and ventilation, adding green components, and creating a more comfortable living environment for residents in a green project. Additionally, with the increasing demand for Building Information Modelling (BIM) to be integrated into green projects, Green Scape Residence can be considered a real example of those adopted projects [29]. Furthermore, a project in the GCC region can be classified as an advanced approach for adopting BIM technology for further consultancy projects [30].

Fig. 15: High-Rise Block Elevation.

Culturally, semicircular arches may reference historical architectural styles or regional traditions, adding a sense of heritage or local character to the project. Moreover, semicircular arches are not characteristic of the architectural area; however, employing these elements in a repeating pattern represents a thoughtful blend of aesthetics, functionality, human experience, and cultural context, enhancing the appeal and character of the housing project. Another goal of this design is to enhance users' health and satisfaction by improving visual comfort through adequate natural daylight, glare control, and outdoor views. Additionally, these designs can evolve into adaptive façades, utilizing technological advancements that have become popular for enhancing indoor conditions [31].

4.7 Landscape

The landscape design plays a vital role in enhancing the overall living environment for residents [32]. The incorporation of courtyards and plazas not only adds aesthetic value but also serves functional purposes. These open spaces provide areas for recreation, social interaction, and relaxation, contributing to a sense of community within the complex. Additionally, these spaces should foster the development of expansive, futuristic urban areas with a modern aesthetic [33]. Furthermore, the landscape design improves the lighting and ventilation conditions within the complex. Trees and greenery are strategically positioned to provide shade, reduce heat gain, and allow natural light to enter the buildings. The area is enhanced with various features, including shaded seating areas, barbecue spots, and pedestrian and bicycle paths that connect all the blocks, promoting walking and encouraging a healthy lifestyle for the users. Water features and fountains also enhance the space's cooling effect and aesthetics, as illustrated in Fig. 16.

Fig. 16: An illustration of the main plaza.

Overall, the project's landscape design is meticulously planned to create a harmonious and sustainable living environment that promotes the well-being of its residents, as illustrated in Fig. 17.

Fig. 17: An illustration of the main plaza from a different view.

Car parking was thoughtfully designed to ensure convenience, safety, and efficiency. Several factors were considered, including the number of residential units (about 600 units), types of vehicles, and local regulations. Adequate parking spaces were provided, considering future growth and accessibility needs.

In other words, the design included a parking reserve for future expansion and development of the project site. Additionally, designated pedestrian walkways, sufficient lighting, and clear safety signage were included. Furthermore, Green spaces and landscaping were incorporated to enhance the parking area's aesthetics, as shown in Fig. 18.

Fig. 18: Parking areas with the master site plan.

5 Keys to innovative housing design in architectural design studio

The second stage of the method structure focuses on the key factors that form the foundation for creative housing design. In this context, fifteen keys to brilliant architectural housing design have been identified to enhance creative housing design in advanced architectural design studios. The selection process of these keys addresses various aspects of the project's design principles relevant to innovative housing design. As illustrated in Fig. 19, the keys to brilliant architectural housing design are

functionality, design concept, aesthetics, sustainability, adaptability and flexibility, safety and security, contextual integration, efficient use of space, material selection and durability, human experience, healthy environment, health, and social benefits, open spaces and green spaces, blending modern and traditional elements, and the final presentation of the project. Additionally, those keys can be classified into several categories in future research. The mentioned keys were considered by the designer from the early stages of the design process and during the various stages of design development to follow the intended framework of creative housing design. Ultimately, the main goal of tackling these key elements of exceptional architectural housing design is to improve the outcomes in the design studios by applying a scientific approach that encourages design creativity.

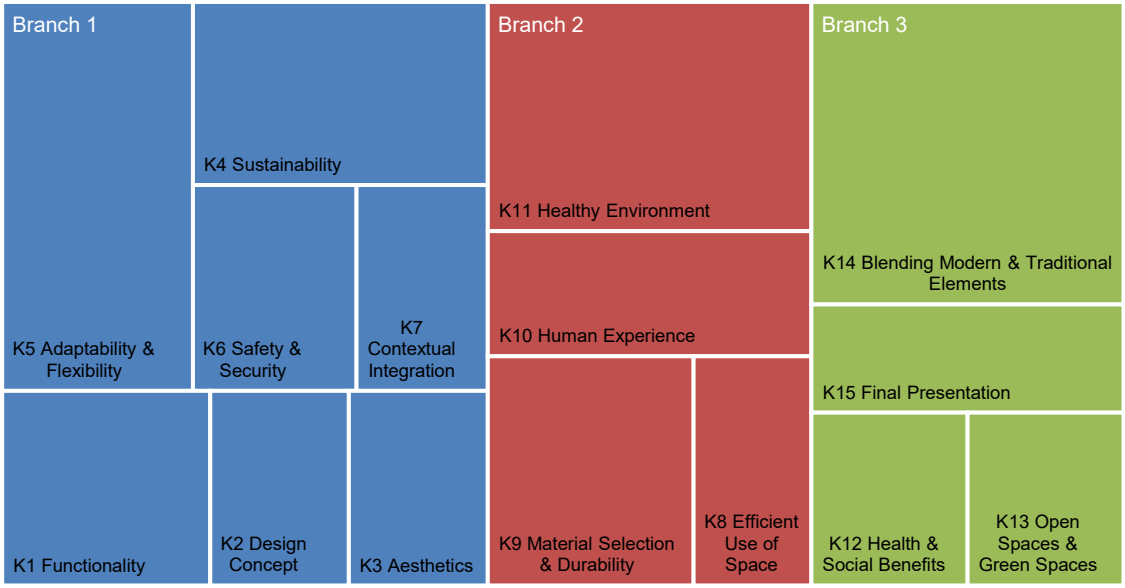

Fig. 19: 15 Keys to architectural brilliance.

To assess the framework, a questionnaire was designed to evaluate the key design foundations applied in Green Scape Residences for housing design in architectural design studios. Based on the Likert Scale, the survey was disseminated to academicians and professionals to determine the keys that enhance creativity in housing design. As shown in Figure 20, the responses are presented in a rating scale used to measure participants' opinions in a survey. It offers a range of answer options, from one extreme attitude to another, sometimes including a moderate or neutral choice (point scales).

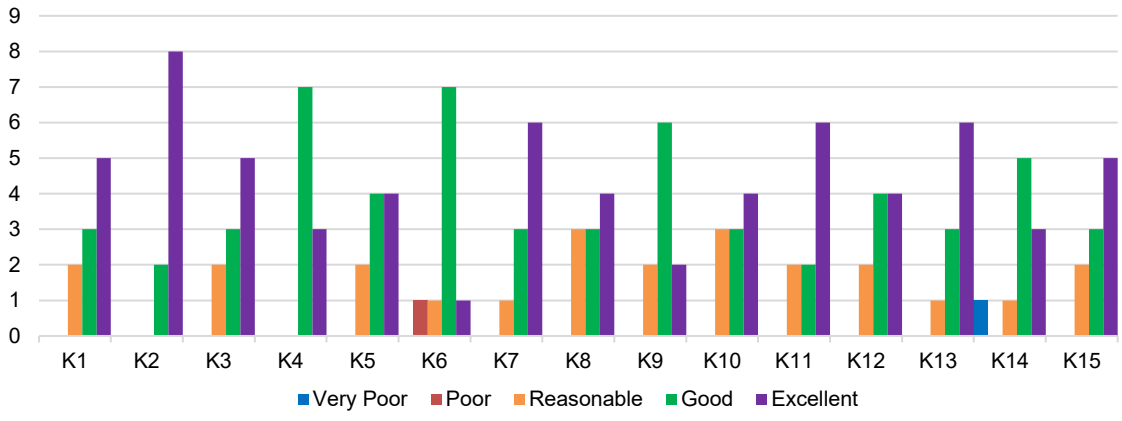

Fig. 20: Feedback from academicians and professionals on the 15 keys.

As illustrated in Fig. 21, the survey responses from academicians and professionals show the overall percentage and ranking of the 15 keys in Green Scape Residences, which enhance the creative housing design in the overall design process. Consequently, the significant Architectural Brilliance keys in the proposed framework are highlighted as the highest-achieved keys, precisely: (K2) Design Concept (96%), (K13) Open Spaces & Green Spaces (90%), and (K11) Healthy Environment (84%). In contrast, (K14) Blending Modern and Traditional Elements (42%), (K7) Contextual Integration (50%), and (K9) Materials & Durability (54%) were identified as the least achieved keys that enhance creativity in housing design.

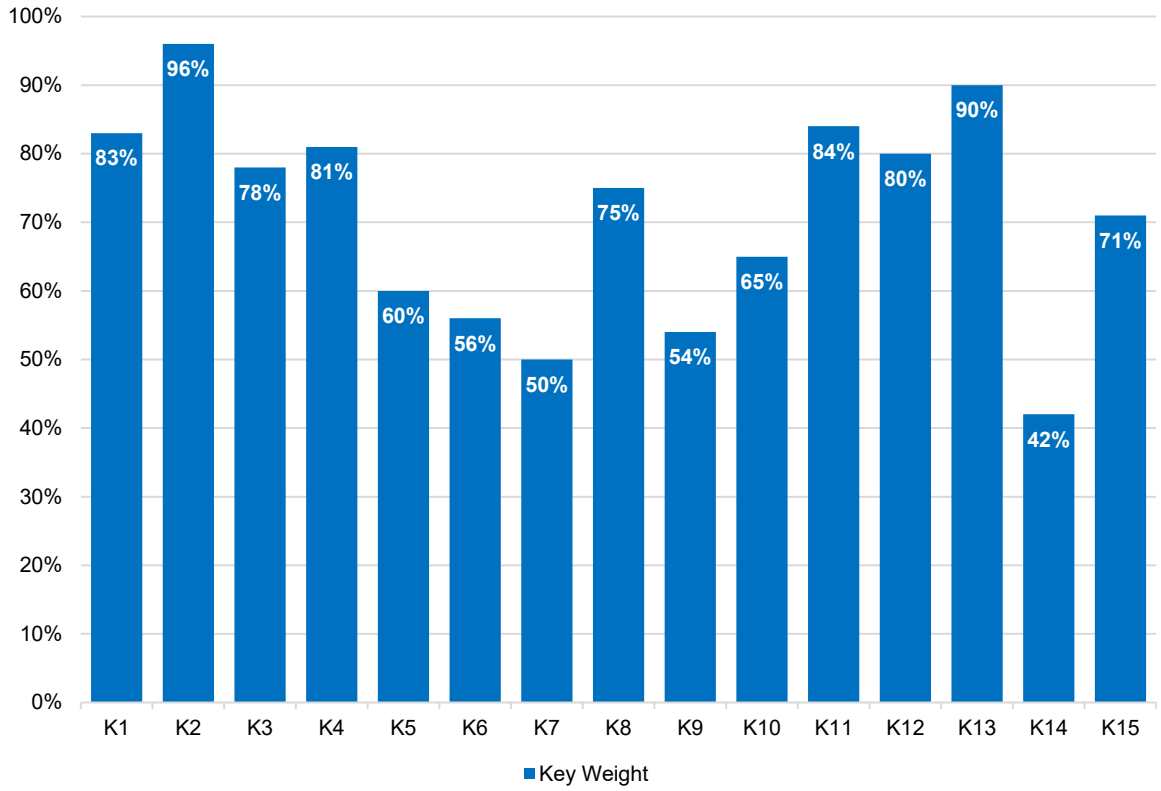

Fig. 21: Overall percentage of the 15 keys in green scape residences.

In light of this, the key design foundations applied in Green Scape Residences can be categorized into six areas: Functional Aspects, Aesthetics and Design Principles, Sustainability and Environmental Considerations, Human-Centered and Social Aspects, Safety and Integration, and Final Presentation of the project, as shown in Table 2. Consequently, the mentioned categories may align with the design mindset, approach, and the design studio's adopted framework.

Table 2. Architectural keys categories.

Category	Architectural Keys			
Functional Aspects	**K1** Functionality	**K8** Efficient Use of Space	**K5** Adaptability & Flexibility	
Aesthetic & Design Principles	**K2** Design Concept	**K3** Aesthetics	**K14** Blending Modern & Traditional Elements	
Sustainability and Environmental Considerations	**K4** Sustainability	**K9** Materials & Durability	**K11** Healthy Environment	**K13** Open & Green Spaces
Human-Centered & Social Aspects	**K10** Human Experience		**K12** Health & Social Benefits	
Safety & Integration	**K6** Safety & Security		**K7** Contextual Integration	
Final Presentation	**K15** Final presentation			

Among the 15 keys, 20% were related to Functional Aspects, 20% to Aesthetic and design Principles, 26.7% to Environmental Considerations, 13.3% to Social Aspects, 13.3% to Safety and integration, and 6.7% to Final Presentation. In this context, the Functional Aspects and Environmental Considerations categories achieved the highest percentages in the survey of the 15 keys in the housing design framework. This reflects the impact of these categories and their role in achieving innovation in housing design. Fig. 22 illustrates the elements' weight relevant to their category within the six categories and the creative housing design.

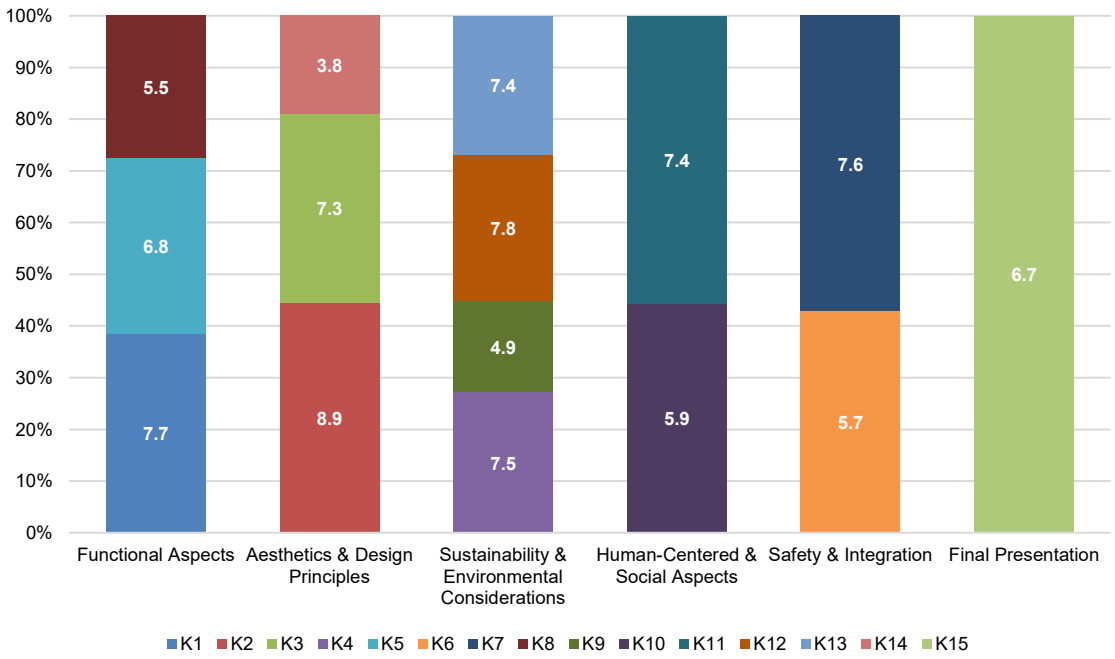

Fig. 22: Categories of architectural brilliance keys and element weight.

6 Conclusion

In the mosaic of architecture, this paper presents a framework for creative housing design in an architectural design studio. Moreover, the research demonstrates ways to think, study, and generate housing solutions relevant to different factors or aspects of the housing principles and rules. This aimed

to develop the adopted methods and strategies for more comprehensive housing design practice. Furthermore, this paper briefly describes how the Green Scape Residences project was conceptualized and presented. The Green Scape Residences was one of the pioneering projects selected for this scientific study to address the public sector's social, sustainable, and economic aspects within the intended keys of architectural design excellence. In light of this, the proposed framework primarily relies on 15 key elements of architectural aspects throughout the design process in the architectural design studio. The primary 15 essential keys aim to achieve architectural excellence and promote innovative housing design. Additionally, the design process described the research framework in different stages of project development. Then, the 15 keys to Architectural Brilliance were assessed by a comprehensive survey of academics and professionals to examine the relevant design framework. This method provides an overview of the factors influencing housing design from different perspectives. The survey outlined that the key elements of Architectural Brilliance, which influence creative housing design, include the Design Concept, Open Spaces, Green Spaces, a Healthy Environment, Functionality, and Sustainability. In contrast, blending modern and traditional elements, contextual integration, and materials and durability were identified as the least effectively addressed factors that enhance creativity in housing design. The key design principles used in Green Scape Residences are categorized into six domains based on common architectural specializations. Eventually, the paper highlights the primary keys and categories that enhance creativity in housing design within advanced architectural design studios. Ultimately, this approach will establish a foundation for developing an advanced framework that enhances creativity in housing design principles from an academic viewpoint.

References

[1] United Nations Human Settlements Programme (UN-Habitat). World Cities Report 2022: Envisaging the Future of Cities. UN-Habitat, 2022.
[2] Salama, Ashraf M. Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond. Ashgate Publishing, 2015.
[3] KUHN, S.: “Learning from the Architecture Studio: Implications for Project-Based Pedagogy.” International Journal of Engineering Education, vol. 17, no. 4–5, 2001, pp. 349–352.
[4] CHING, FRANCIS, D. K. Architecture: Form, Space, and Order. 4th ed., Wiley, 2014.
[5] Lehmann, Steffen. Sustainable Urbanism: A Resilient Design for the Future. Routledge, 2010.
[6] M. F. AL-KAZEE, R. A. OSMAN, K. S. AL-MUNAIJRI, N. K. AL-NAABI: Old Al-Seeb Sector: A Contemporary Approach to Redesign Major Urban Areas. (SCS 2019) 2nd Smart Cities Symposium, 24-26 March 2019, University of Bahrain. DOI: https://doi.org/10.1049/cp.2019.0235.
[7] ANTHONY, KATHRYN, H.: "Design Juries on Trial: The Renaissance of the Design Studio." Architectural Education, 1991.
[8] BEATLEY, T.: Biophilic Cities: Integrating Nature into Urban Design and Planning. Island Press, 2011.
[9] YEANG, Ken. Ecodesign: A Manual for Ecological Design. Wiley-Academy, 2006.
[10] GEHL, Jan. Cities for People. Island Press, 2010.
[11] AL-KAZEE, MOHAMED FAISAL, AL-SOBHI, ROBA, AL-MAAMARI, SAJA, AL-NAIRI, SIHAM: Towards Muscat Governorate Development: A Prospective Urban Approach to Redesign Old Al-Seeb Area. Conference: AR-UP 2019 - Architecture and Urbanism: A Smart Outlook. Cairo, Egypt, 2019.https://www.researchgate.net/publication/360947038_Towards_Muscat_Governorate_Development_A_Prospective_Urban_Approach_to_Re-Design_Old_Al-Seeb_Area.
[12] ELHAMDOUNI, S., IDRISSI, Y., CHERKAOUI, E., NOUNAH, A. & KHAMAR, M.: Dynamics of Urbanization in the City of Rabat-Morocco, Which Sustainable Transition?. Civil and Environmental Engineering, 2024, Sciendo, vol. 20, no. 2, pp. 1140-1151. https://doi.org/10.2478/cee-2024-0083.
[13] CHING, FRANCIS, D. K.: Architecture: Form, Space, and Order. 4th ed., Wiley, 2014.
[14] SCHUMACHER, P.: The Autopoiesis of Architecture, Volume 1: A New Framework for Architecture. Wiley, 2011.
[15] OXMAN, Rivka, OXMAN, Robert: Theories of the Digital in Architecture. Routledge, 2014.
[16] FARR, DOUGLAS. Sustainable Urbanism: Urban Design with Nature. Wiley, 2007.
[17] DIAS, LOKE, MARY, NOAN: A Guide for Apartment Design, Planning and Design. 2016.
[18] KIBERT, C. J. (2016). Sustainable Construction: Green Building Design and Delivery (4th ed.). Wiley.
[19] DUNHAM-JONES, E. & WILLIAMSON, J. (2009): Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs. Wiley.

[20] HALL, P. (2014): Good Cities, Better Lives: How Europe Discovered the Lost Art of Urbanism. Routledge.
[21] GERo, J. S. & KWON, S. (2015): "Designing and Innovation in Architecture: A Knowledge-Based Approach." Design Studies, 39(1), 59-80. https://doi.org/10.1016/j.destud.2015.01.001.
[22] Ernst NEUFERT, Peter NEUFERT: Architects' Data, Fourth Edition 4th Edition. 2012.
[23] MARK LOAN, SR. LANSCON, The Housing Design: A Guide to Practice. Routledge, 2017.
[24] BOLM, NIKLOS, SANDY, ALM: Sustainable Housing Design in the Era of New Technology, Approach of Practice. 1st Edition 2013.
[25] DAN G. SUN, SARVANG: Housing Combination: Landscapes, Encounters, Their Applications. 2021.
[26] DĘBSKA, L.: Assessment of the Indoor Environment in the Intelligent Building. Civil and Environmental Engineering, 2021, Sciendo, vol. 17, no. 2, pp. 572-582. https://doi.org/10.2478/cee-2021-0058.
[27] AL-KAZEE, M. F., NEGIN TAJI, S., NASR, T., MANSOORI, R. & MAHDAVINEJAD, M. (2025): Reframing the early-stage design process of residential buildings based on an energy-efficient, designerly decision support system (DDSS). Future Technology, 4(2), 30–40. Retrieved from https://fupubco.com/futech/article/view/285.
[28] AL KAZEE, M. (2019). Software Engineering and Its Role in the Study of Office Space. Journal of Architecture, Arts and Humanistic Science, 4(13), 373-386. doi: 10.21608/mjaf.2018.20407.
[29] SOLLA, M., Elmesh, A., Memon, Z.A., Ismail, L.H., Kazee, M.F.A., Latif, Q.B.A.I., Yusoff, N.I.M., Alosta, M., and Milad, A., 2022. Analysis of BIM-based digitising of Green Building Index (GBI): Assessment method. Buildings, 12(4), p.429. https://doi.org/10.3390/buildings12040429.
[30] MOHAMED FAISAL AL-KAZEE, RACHA RAMHAMDANI (2022): The Adoption of BIM Technology in the Architectural Consultancy Firms in the GCC Region. Civil Engineering and Architecture, 10(1), 280 - 288. DOI: 10.13189/cea.2022.100124.
[31] FATEMEH MEHRVARZ, MOHAMMADREZA BEMANIAN, TAHEREH NASR, REZA MANSOORI, MOHAMMED FAISAL AL-KAZEE, WAEL A. KHUDHAYER, MOHAMMADJAVAD MAHDAVINEJAD: Designerly Approach to Design Responsive Façade for Occupant Visual Comfort in Different Latitudes, Journal of Daylighting 11 (2024) 149-164. https://dx.doi.org/10.15627/jd.2024.9.
[32] REEM ABDALLAH AL BALUSHI , MOHAMED FAISAL AL-KAZEE, (2025). LEGO Park: An Innovative Approach to Future Architectural Landscape Design and Ecology. Civil Engineering and Architecture, 13(3A), 2340 - 2355. DOI: 10.13189/cea.2025.131313.
[33] SALLAM, I. & AL-KAZEE, M. F. (2025): Schizophrenic urbanism: a quantitative approach for monitoring deviation in neighbourhood's planning standards. Journal of Architecture and Urbanism, 49(1), 57–71. https://doi.org/10.3846/jau.2025.22769.