



SUSTAINABLE DESIGN OF A HIGH-RISE RESIDENTIAL COMPLEX IN SHIRAZ WITH AN APPROACH ENHANCING CULTURAL INTERACTIONS

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ARTICLE INFO

Article history:

Received 05 September 2018
Received in revised form 26
October 2018
Accepted 29 October 2018
Available online
01 November 2018

Keywords:

Architectural design;
High-rise housing;
Sustainable Architecture;
Public spaces; Social
Interaction.

ABSTRACT

The level of satisfaction of an individual's housing has a great influence on him and his personal and social relationships. One of the phenomena faced by cities, especially large cities, is high rise buildings. Nowadays, with the growing population of cities on the one hand, and the rising of land price, on the other hand, preferring heights has become an inevitable matter in many of the world's densely populated cities. This research being of survey kind, attempts to analyze the factors influencing cultural interactions in the design of residential complexes from the viewpoint of residents. Data was collected through questionnaires and interviews with relevant experts and locals living in high-rise buildings. The site is located in the east of Shiraz, on Kouyah Vahdat Street, in the alley of Shahid Zabihollah Banshee. When designing a high rise residential complex, the factors should be considered including: paying attention to setting of the space adjacent to the entrance of the residential building, the proper connection of the interior space with nature, the use of local and familiar elements to create a sense of belonging, designing collective spaces for interactions between households, and attention to the issue of security in space design. A high-rise building is the ultimate outcome of a complex process whose elements interact with each other and several factors, including cultural, social and economic characteristics affect it. The proper and conditional uses of high buildings, is a realistic and desirable solution for people to settle.

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1. INTRODUCTION

The construction and design of urban spaces has affected the process of social life and should physically and psychologically be efficient for citizens (Saifaei, 2005). Residential complexes that were once created to form a pattern of communities among beautiful green spaces gradually converted into high density housing complexes (Pakzad, 2007).

It should be noted that the designing of residential complexes is not regarded as constructing a

number of similar building blocks, but it is described as creating space constraints, providing high quality open spaces and creating an aesthetic combination; the building mass and urban space should be considered in the layout of the blocks. The determination of the distance between building blocks is also important for lighting, walking, parking, outdoor and green spaces, and, in general, regulating the relationship between building blocks and open spaces, i.e. a design that is defined for open spaces which considers a specific concept and function in this regard, enjoys a great importance (Such as public gathering, public gardens, children's playgrounds, pedestrians, bike path, playgrounds, etc.) (Azizi and Sarem, 2007).

Since only a small percentage of people in high-rise buildings have social relationships with each other, one of the things that can be effective in this area is the creation of visual focus, plants, playgrounds and open spaces (Zarghami, 2010).

Researches show that living in high-rise buildings is valuable in some respects, such as beautiful views and landscapes, a feeling of being unique in terms of height, privacy, silence, and credibility; however, this information is not final as there are other people who reported dissatisfaction with living in these buildings because of decay and damage to the building, lack of privacy, isolation and loneliness (Tavakkoli, 2004; Ritzer, 2013).

High-rise housing and its design has been an important challenge for architects since the beginning. Part of the problems and the lack of sustainability in the design of high-rise housing construction is related to the recognition of cultural and social issues. The consequences of this situation are damage to the foundation and health of family, individuals and society. Therefore, even the internal relations of the family are affected by the inadequate structure of the house and disrespect in the house becomes ineradicable. By undermining the credibility of the family, addiction and other social anomalies penetrate into the depths of society (Freund, 1989).

The project area is selected due to the lack of attention to high-rise housing complexes and being away from social issues and social interactions of the residents of Shiraz. We attempt to provide a practical plan to promote the level of culture and welfare of the citizens in these complexes.

2. REVIEW OF LITERATURE

2.1 INTERACTIONS CULTURAL

Parsons has defined cultural interaction as a social system containing a set of actors who interact in a situation in which at least physical or environmental aspects are interacting. These actions are driven by the tendency to satisfy the desirable level, and their relationship with their position, as well as each other are specified in terms of and through a structured cultural system and mutual institutions. In this definition, cultural interaction based on the basic concepts of Parsons-action theory, mutual interaction, environment, satisfaction of desired limit, and culture is determined (Roche, 1997).

In other words, cultural interaction is a set of social roles. The social system is the interaction between characters and individuals which encompasses social institutions and organizations whose function is to produce justice and cultural legitimacy (Bentley, 2003).

Particularly, cultural interaction is composed of many actors interacting in a physical and

environmental situation, direct their tendency toward maximizing pleasure motivation and their relationship with the situation that includes others is created in a system of cultural structures and mutual values. Therefore, it can be said that cultural interaction is a set of interactions of motivational, targeted and relevant actions in the socio-cultural environment and situation (Lynch, 1972).

Conceptually, cultural interaction involves a set of mutual actions in which two or more actors are interconnected and mutually support each other and act in a collective way. The concept of cultural interaction is an instrumental and absolutely analytical or abstract perspective; It is a way of understanding reality (Cullen, 1998).

Three preconditions or stages should occur in order to increase cultural interactions in a space: 1. the presence of people in space 2. Seeing and being seen 3. Face-to-face communication and speaking. In the first step, readability, accessibility, security, perception of the environment and land use diversity are some of the effective factors. (Hudman and Yazosek, 1991; Giddens, 2005). In the second stage: the form of space, the proportions, the scale, the type of components and elements of space and the connection between them, can be considered as determinant and influential factors. (Nemati, 2010; Listakin and Robert). But in the third stage, some criteria must be mentioned in order to determine their correctness or incorrectness while examining them in different urban spaces.

People's talking or, in other words, their interaction will usually occur under certain conditions. According to Giddens, for having this connection, two individuals should have enough time to be together at first; then they should trust each other; in the next stage, there should be a common issue that encourages them to speak with each other (Rajabi et al., 2011).

2.2 THE RESIDENTIAL COMPLEX

Housing is something more than a physical location which is a very complicated and broad issue. The importance of housing comes from a place where many of the basic needs of an individual, such as food, resting, etc. are provided. The concept of housing, in addition to physical location, includes the entire residential environment, i.e. all essential services and facilities for a family's living and employment, education and health plans [Kashfi, et al. (2012)]. Housing is a permanent shelter for human settlements. Since shelter is needed for everyone, the provision of housing has long been a concern for not only individuals, but also the government. Thus, the history of housing is inseparable from the social, economic, and political development of human species (Moztarzadeh and Hojjati, 2011).

In small and medium-sized cities, most residential complexes are located in the suburbs. These complexes are designed based on regulations and land use preparation plans; they include many residential units in the form of 3-5 storey building blocks that have been constructed on a large piece of land (each with concrete intervals). In these areas, despite the existence of residential complexes, the buildings are low rise, and the land economy does not justify the construction of high-rise buildings. In contrast, in big cities, the term residential complex relates to high-rise buildings; the high cost of land in such cities makes construction of short and low rise buildings unprofitable. Affordability of the household, culture, construction management and utilization management have an important role in encouraging households to live in residential complexes. [Naghizadeh,

Mohammad (2000);]

The reason of building residential complexes is based on the human needs to maintain the security and ability to provide security by collective forces compared to the individual forces. Human beings like to live in groups to the extent that they do not harm their privacy. The existence of residential complexes allows people to benefit from more and more facilities; such as service and recreation spaces as well as lower costs as a result of the contribution among more households (Rastbin et al., 2012).

Many residential complexes share a space commonly used by the residents of the complex, and others –not living in the complex- have no right to use or even to enter it (Nozari et al., 2008).

In their study entitled "Indicators of Optimal Housing and Pathology of its Problems in Iran" Moztafzadeh and Hojjati (2011) classified the most important criteria for desirable housing as follows (Golkar, 2000):

1. Security and safety: This security refers to the security against disasters, natural and unnatural accidents, against other forms of aggression in the community, against the effects of human activities as well as other aspects of security. In order to ensure security, the following factors are recommended: appropriate housing location considering other urban functions, the selection of suitable materials that are not necessarily expensive, the adoption of appropriate methods of construction, anticipation of necessary measures to reduce damage in an occurrence of an accident and appropriate locating related to the functions of pollutants, especially air pollution and noise pollution [Nasabi, Fatemeh (2005)].

2. Peace: home is the place where a person is in peace and comfort. Peace is not merely due to the physical comfort of the person and families; also, peace is not a result of sense of security against external threats. In other words, it is due to the inner peace that governs the family members and their relationships. The peaceful spirit of the house should also appear in its appearance [Pakzad, Jahanshah (2007)]

3. Coziness: The home is described as a quiet place in which you and your family spend time. It should be cozy and must announce this quality to others. It must be presented that in this place individual's private relationships have dominated the collective and public ones [Pakzad, Jahanshah (2007)].

4. Privacy: internal spaces of the house being covered from stranger's view is a case on which the comfort of the family depends heavily. Firstly, strangers should not dominate internal spaces; secondly, the realm of family members should be distinguished in the right way [Baraton, H and Grant, M. (2003).].

5. Flexibility: Home is the most self-conscious place to be known by man in life. He does not want to be influenced by the environment, but wants to influence it. He wants to have and change this original place according to his needs. In this regard, designers should act in such a way that the design is not inflexible and predetermined in order to provide the least possible intervention for inhabitants.

2.3 FACTORS AFFECTING INTERACTION OF RESIDENTS OF RESIDENTIAL COMPLEXES

The ability to create face-to-face communication has essentially led urban spaces to be regarded as a medium for forming the social capital and attention to the improvement of their quality is one of the most important goals of urban design knowledge in contemporary times (Nasabi, 2005). In 1981, Kevin Lynch described the quality of urban design and consequently, the improvement of the quality of urban life by promoting his theory called 'A theory of Good City Form'; he based his theory on five criteria and two super criteria. [Baraton, H and Grant, M. (2003).]

- Liveliness: the possibility of biological and sociological survival in a city environment;
- Meaning (sense): mental role and meaningfulness of urban places;
- Adaptation: conforming to the urban form with various activities and behavioral circuits;
- Accessibility: the facility of "physical penetration" into different parts of the urban context;
- Controlling and monitoring: to allow citizens to be selected and intervened in matters related to management and utilization of the public sphere of the city.

2.4 COLLECTIVE ACTIVITIES IN PUBLIC SPACES OF A RESIDENTIAL COMPLEX

Social communication takes place through a variety of activities in the environment, the most important of which are:

1. Speaking and listening: One of the basic interests of individuals is to focus on people in the environment. They sometimes like to have a meeting, conversation, public ritual and a collective game; the places without people scare them.

2. Meetings: One of the social activities is to call and meet people, discuss and exchange ideas with them. Here meeting is regarded as the concept of a planned visit, being held after waiting in a special space.

3. Coming and going: Having simple access to public spaces, residential environment can attract people and activities to the environment. Walking is the main event in residential environments that, while bringing health and vitality to individuals, brings energy to the public or collective spaces in residential environment; moreover, it facilitates activities such as meeting and conversation in these spaces being welcomed by the inhabitants .

4. Public celebrations: Certain social and religious ceremonies and events can take place in public spaces of the residential environment, such as joint meetings of residents, celebrations and religious ceremonies.

5. Games: One of the most common activities for most age groups is game. This activity begins with the playing of children under the supervision of families in a residential setting and extends to the playing of adults in more public places.

6. Exercise: The design of spaces and sports facilities in a residential environment should be tailored to the environment and conditions so that simple movements, walking, chess, etc. can take place .

7. Recreation: it includes any activity that is intended to meet the need for leisure. Every holiday is done at this time, but not all leisure time is necessarily fun .

Table 1: Factors and impacts of cultural interactions in residential settings.

Physical factors	Existing functions in space	
	considering proportions	
	Human scale	
	Path safety	
	Attention to the five senses	
Psychological factors		
Presence of green space		
Communicative space	Physical dimension	Providing territory, security, coherent structure, continuity of legibility and predictability of space
		Availability of convenient facilities in space, responsiveness, climate comfort and peace
	Space Activity dimension	The amount of information, the excitement of the environment: which requires dimensions such as complexity and mystery, education, the possibility of expressing oneself, diversity and conflict, choice, identity, privacy and interest in space.
		Social interactions
Physical features	Physical opportunities for sitting, pausing and more reflection in space	
	focal spaces for gathering people such as playgrounds, bus stops, places to eat and ...	
	Inviting entrances, visual and physical access	
	Suitable spatial paths and communications to guide people in space, legibility and spatial clarity	
	Vehicle access control and pedestrian safety	
	Definition of bodies and the walls	
	Anticipating attractive activities	
	Predicting functional elements along with its aesthetic dimensions	
Architectural and environmental factors	Accessibilities	
	Mass and space	
	Urban landscape	
	the environment	

3. RESEARCH METHODOLOGY

This research follows a survey method. The project area is selected due to the lack of attention to high-rise housing complexes and their staying away from social issues and social interactions of the residents of Shiraz. We attempt to provide a practical plan to promote the level of culture and welfare of the citizens in these complexes. The data collection method used in this study is through questionnaires and interviews with relevant experts and locals living in high-rise buildings; this will be done randomly. First, by documentary method and reviewing the available resources, importance and necessity of paying attention to cultural interactions in high-rise residential complexes is presented; then theoretical foundations of the project including subcategories such as the concept of residence, the concept of sustainability and cultural interactions, the theoretical foundations associated with housing in low rise buildings and neighborhoods are examined; therefore, theories and views on high-rise buildings, as well as the role and effect of buildings will be investigated through library, documentary and web studies. The site is located in the east of Shiraz, on Kouyah Vahdat Street, in the alley of Shahid Zabihollah Banshee (Fig. 1). The strategy of this study is qualitative analytical method. This method will be used in extracting some designing principles, attending to the interpretation of cultural interactions, the concept of high-rise buildings, anthropological studies and social relations. We also will consider content analysis and social-cultural concepts.



Figure 1: Location of the site and neighboring areas in the map.

The sixth district is one of the areas directing trips to the city center; the huge demand for travel affirms this issue. According to urban train studies, at peak hours, 9444 people out of 12,186 commuters travel to the eastern part of the city, indicating that the sixth district – considering its resident population- has no suitable job opportunities, which is indicative of the role of dormitories. On the other hand, if we regard 5 types of land uses such as commercial, administrative, temporary housing (hotels), the military-police, and general education as major occupational land uses, we will realize that this region does not have any military use; the other four land uses are not in a desirable level either. Regarding all the climatic factors, such as; wind and suitable light, the optimal climatic direction in Shiraz, is directed toward the south with a 5-10 direction deviation.

4. FINDINGS

4.1 General guidelines

Attention to the setting of the space adjacent to the entrance of the residential building, even small, for short-term expectatisons, such as waiting for taxi or school taxies or buses which impose unwanted interactions on residents of a neighborhood.

- Proper setting of private and public spaces
- The proper relationship of the internal space with nature such as: thoughtful directing of daylight, the proper view, consideration of courtyard and balconies for direct presence in nature and, if possible, the presence of plants in space, natural ventilation, etc.
- Using local and familiar elements to create a sense of belonging in space
- Designing of collective spaces for interactions between households in residential buildings.
- Paying attention to the correct location of private spaces towards a noisy environment to induce comfort.
- Attention to the security issues in design
- Proper locating of the house near the workplace or at least a combination of these two items as separate issues (Farhadi, 2014).

5. SUGGESTED SOLUTIONS FOR DESIGNING SMALL SPACES

5.1 ROOMS

- With better recognition and a more accurate assessment of demands, the functional characteristics of rooms in the design of housing become more relevant and formal.
- None of the features, such as the area or the number of rooms, can provide the expectations and requirements of different people. Rather, it's necessary to consider the interaction of these features in the decision-making approach and the composition of the entire space. The main focus of this approach is to create a balance between the key indicators for selecting and designing rooms and other housing spaces, in line with the residents' expectations and the limited area allocated to the residential unit.
- Providing enough space for the housing project, which at different times or simultaneously has the ability to create separate privacy without causing the defects in spaces' functions, private and public spaces while being utilized.
- Flexible and adaptable design of the rooms, considering types of the furniture to be used in the typical way of inhabitants' living.
- Avoiding disassembly and uniformity of the rooms and using different types of rooms in residential unit designs, in accordance with the physical condition and schedule.
- Prediction of the necessary capabilities concerning shape, size, positioning and other features of the main elements of residential units such as doors, windows and chambers, based on better understanding of the different expectations of the target strata and considering the possibility of switching in the function of multipurpose spaces.

5.2 KITCHEN DESIGN

Strengthening the role of the kitchen in organizing the space of houses by integrating and combining the kitchen space with spaces such as living room, dining room, hall, etc. in order to increase the reception capacity of kitchens for functions such as sitting, gathering, reading, talking, eating, etc.

5.3 CORRIDORS

Avoiding creating narrow boring corridors on storeys; corridors that only are used by people to move without any openings and force people to quickly pass them and reach their houses. The main route in the residential complex should be short, considering that the distance between the main building spaces are being passed several times a day, the need to shorten these distances will be clear. So try to shorten the intervals accessibility as much as possible.

5.4 OUTDOOR

Creating open spaces and green spaces at high rises, on each floor or among several floors, in a common way that facilitates the access of residents to open spaces and green spaces.

- Selecting the right height with the body in spaces such as courtyard, backyard, roof, balcony, skylight and patio as a place to pause and view.
- Improving the quality of open spaces by planting trees, creating verdant spaces and considering appropriate areas for static social activities (sitting, gathering together)
- Revitalization of the roof's space to enhance the space expansion, view and lighting
- Reducing unprotected spaces, such as spaces covered spaces in the campus which is difficult for parents to supervise children.

Separation of various outdoor activities, as considering a place for children to play, exercise and run, as well as a place for residents to sit and talk.

Table 2: Project details linking area, activity, and space.

Subject: Designing a high-rise residential complex in Shiraz with an approach to promoting cultural interactions			
Audience:	Area	Activity	Space
Family	occupation	Parents: out of house having jobs as doctors, engineers, etc. inside the complex, creating cultural interactions. Children: teenagers and youngsters; studying, exercising, behaving in society, teaching the culture of living in apartments	Outside of the complex, amphitheater, a place for gathering, green spaces, home, gym
The reason for residency: Living	Entertainments	Theater, swimming, watching movies, studying, parks, game nets	Library, green spaces, pool, cinema, park, game net
The duration of residence: Rental/ Private property	Resting	Studying, eating, sleeping	Two-bedroom, one bedroom, restaurant
The place of residency: Shiraz, Kouye- Vahdat	Production	Improving cultural interactions Increasing social interactions	Designing a place for consultation and gapping, designing gazebo
Idea	Achieving an improvement in cultural and social interactions by increasing social relations and exchanging knowledge for gaining experience, evaluating satisfaction of residents as well as security by some activities in the complex		

Table 3: Project introduction.


Approach	The name of articles, books, authors	The general description of approach	The description of approach in architecture	Case studies in architecture
Sustainable housing	Sustainable housing against earthquake in the old context of Tehran	Sustainable development is a process for achieving sustainment in any activity that needs resources and fast replacement of them	It initially regards features, challenges and needs of old contexts in Tehran	Farhangian housing in Oudlijan
Improving cultural interactions	The role of public spaces in high rise residential buildings in improving cultural interactions of residents	Reducing negative effects in high rise buildings on personal, social well-being	Different cultural and social events in public spaces result in a sense of belonging and creation of collective memories as well as retrieving collective identity of civilians in cities creating sustainable societies	International Tehran tower
Contextualism	Designing cultural, commercial complexes with a contextual approach	Contextual architecture attempts to imitate doesn't avoid innovation or creativity. It emphasizes on the necessity of attention to the physical environment of the architectural work. It indicates that this attention can be positive in terms of the work and the context. Contextual architecture is an effort for showing the power to create an optimal environment in a macro scale	Reaching to a new plan, integration, and connection to the old structure	

Table 4: Approach Survey.

Approach	Article, book, author	Social value	Social solution	Architectural solution
Improving Cultural Interactions	The role of public spaces of residential high rise buildings in the improvement of cultural interactions of residents	People's tendency to be in public spaces. The role of such places in the interaction of residents. The quality of open spaces and the vicinity of the complex. The use of open spaces and vicinity of complexes. The level of relationship and interaction between residents	Creating open and green spaces at high rises, on each floor or among several floors, in a common way that facilitates the access of residents to open spaces and green spaces.	Providing security and peace The sense of belonging Spatial intimacy Cultural, social interaction of residents Privacy Integration Legibility
	Residential complex for improving the social interactions	There are four main factors including: Providing mental peace Providing security Activity context Giving the sense of belonging to the residents Social homogeneity	Increasing the quality of open spaces by planting trees and creating suitable places for cultural and social activities, sitting and gathering Reducing the indefensible spaces such as covered spaces which interferes the parents' supervision on the children. Separating various functions of open spaces such as considering a playground for children, a place for sports, running, and a place for sitting residents' conversation	

Table 4 selects three approaches, compares them, defines them in architecture, and outlines sample cases related to the approaches. Table 5 explores the selected approaches, selects and analyzes five research work related to the approach. The proposed plan for the site is shown in Figure 2.

Table 5: the survey of selected Approach (Cultural Interactions).

Features of apartments	Advantages	Disadvantages	Solutions for problems
High rise residential complex	Improving the environment's legibility Improving the quality of urban view and affecting the skyline Improving the signal quality of this type of building in the urban landscape and their effects on the creation of a place with identity	The possibility of covering urban view and panorama by high-rise buildings Creating visual impairment in the environment Creating subtropics and vast shadows Lack of open space in proportion of the building mass	The use or form of the ground floor in the building can determine the level of vitality in the environment and surrounding streets

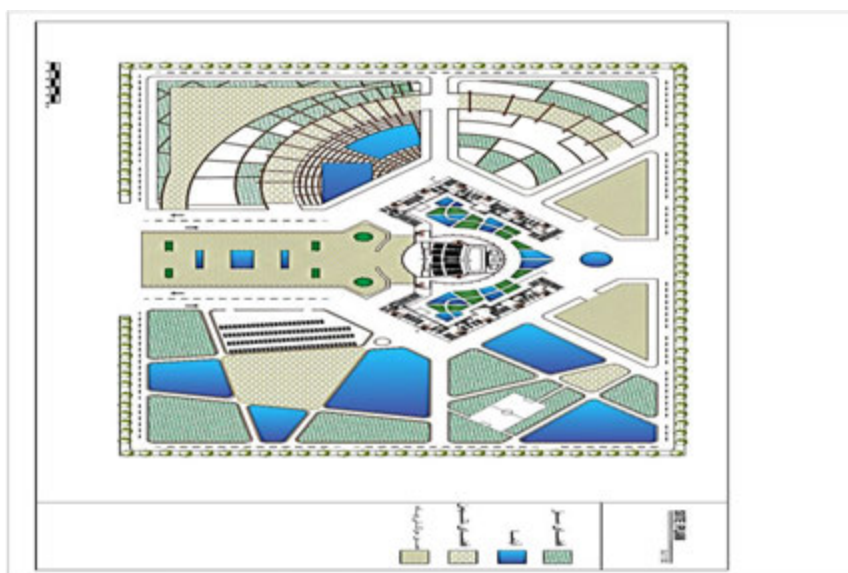


Figure 2: Propose site plan.

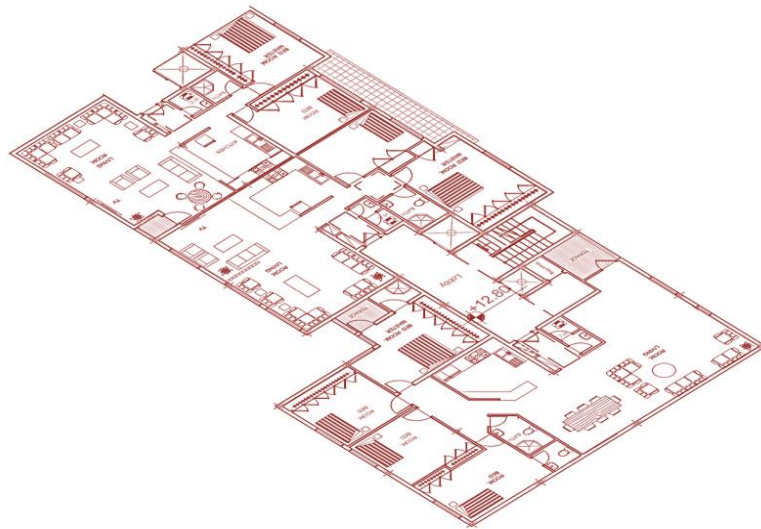


Figure 3: First to third floor's plan.

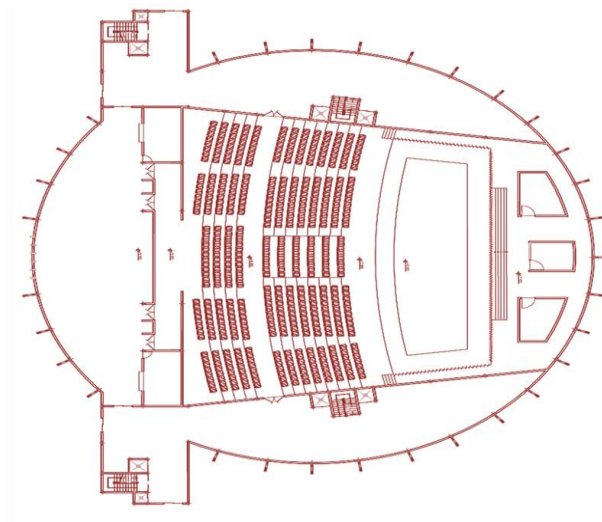


Figure 4: Interactive space of the first floor.

In Figure 4, interactive space is shown in the residential complex. In Figure 5, interactive space is considered for the second floor of the residential complex. the interaction space considered for the third floor is shown in Figure 6, parking plan in Figure 7. Figure 8 shows the external appearance of the residential complex in Shiraz.

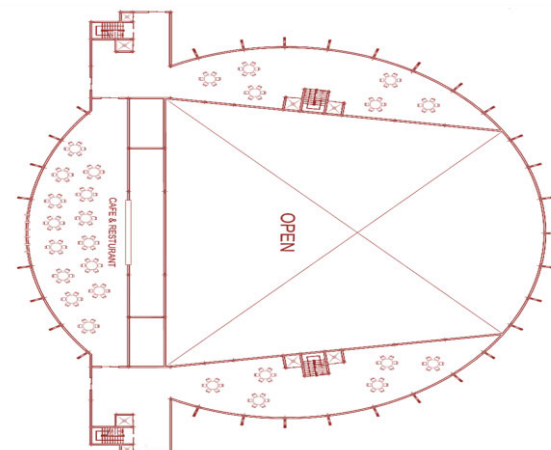


Figure 5: Interactive space of the second floor.

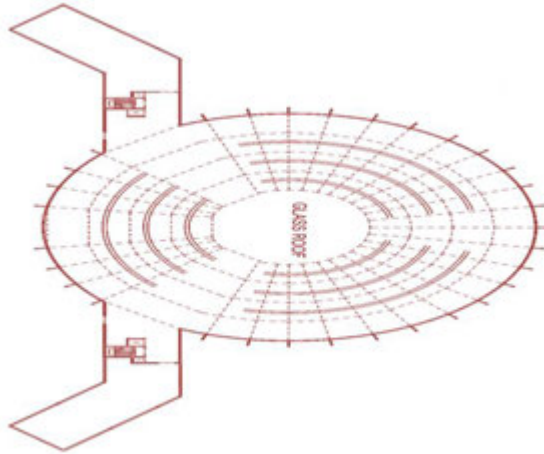


Figure 6: Interaction space of the third floor

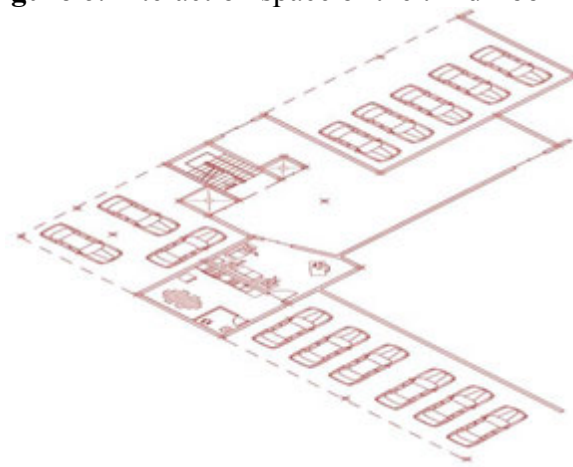


Figure 7: Parking plan.



Figure 8: External Perspective.

6. CONCLUSION

In sustainable design, special attention should be given to cultural interactions, energy consumption, and the impact of the environment, buildings and cities. So, a suitable and decent house is necessary to attain social cohesion, personal welfare and individual autonomy; if housing is not

sustainable, no society will be able to achieve sustainable development. Considering the place of residence, as the first peaceful and safe atmosphere in people's lives, helps us to keep the meaning of the social concept and the achievement of a healthy life, leading us to a great future. In other words, high-rise housing and design has always been an important challenge for architects. Part of the problems and the lack of sustainability in the design of high-rise building construction are due to the recognition of cultural and social issues. Following the principles of cultural interactions of residential complexes is important for achieving sustainable development, which should be done to improve the quality of life. So, with a deep look at the housing problem in today's cities, it can be seen that there is no balance between privacy and cultural interactions that are fading away.

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