

ORIGINAL ARTICLE

Design of residential complex in order to increase quality of life with emphasis on open and semi-open private spaces

M.N. Asli

Department of Architecture, University Campus 2, University of Guilan, Rasht, Iran. E-mail:

Mehdi.Neshandar@yahoo.com

Received: 18.08.2018. Accepted: 28.08.2018

The open space to this day has been an inseparable part of human life, and man has lived through open space communication, but in today's residential units he has been forced to choose a vertical residence and ignore the presence of nature and connection with it in general. Nowadays, open spaces do not have the meaning of the past and lack the architectural value and lacking architectural value because these spaces are not initially designed and they are remainings of built spaces.

While open and semi-open spaces, from the past and in our traditional architecture, have played a major role in the traditional architecture of space, and in general, its shape and geometry has used its environmental features, and most of the individual and social activities of the human being was in it and in the past architecture it was built in the same way in the building.

Open spaces today can be a good solution to the relationship between human life and nature, because open spaces play an important role both psychologically and physically in human life.

The research is composed of two stages. In the first stage, the library methodology and the study of documents, the types of open and semi-open spaces, and the history of modern housing has been described, and its characteristics has been compared with the characteristics of traditional housing.

Subsequently, by presenting the human physical and mental needs, a theoretical framework has been determined for indicating the criteria for the study space. The second stage of the research was conducted by field survey and the collection of existing samples and their analysis based on the criteria of the first stage.

The results of this research are guidelines for designing open and semi-open private spaces in housing, which is in the form of three levels of strategy and suggestions in the field of design.

Keywords: Residential complex; quality of life; open and semi-open private spaces

Problem statement

With population growth in Iran, the urban population has increased. This rule is not the exception in Rasht, and life in the city requires the provision of adequate housing.

On the other hand, the high cost of living and the high cost of the earth have forced people to live socially in a collective place. The impossibility of horizontal and superfluous expansion of cities has led people to live in highlands and high-rise buildings, which has created apartments and residential complexes.

But what is being seen in this process is the need for adequate attention to the private sphere. Failure to pay attention to the needs of humans or inhabitants of residential complexes in the design of open and semi-open private spaces raises the question of whether private areas such as balconies, which are a private open space, respond adequately to human needs? how can these areas be created if the answer is negative?

By increasing the construction of residential complexes, quality has been sacrificed to a great extent. So that the existing residential complexes respond only to some of the physical needs of the people and have not paid attention to the natural and psychological needs of humans, such as sense of belonging, local security and space for personal and family activities.

The lack of sense of belonging and consequently lack of responsibility towards the place of life leads to the appearance of alienation between man and his environment. Each of these problems has in turn has been led to a drop in the quality of life in apartments and residential complexes

Unfortunately, the economic causes have led to a lack of attention or neglect of open spaces (yards) within apartments and residential complexes. So that these spaces are small in residential complexes or are just for the place of this name. Failure to pay attention to these issues has even raised security issues for residential units, even in some cases.

The charter of the United Nations Resettlement Law states about the quality of human residential units,"Every home has

access to green space, courtyard, balcony, backyard, private and furnished oversized roof, which is preferable to the sky." One can use open and semi-open private spaces to achieve the desired conditions.

Research background

Quantitative and qualitative studies of the Open and Semi-open Private Spaces or the General Residential Complex have been carried out with a variety of approaches, which are referred to below:

- In 2013, at the first regional conference on architecture and sustainable architecture, Izeh urbanism, Zahra Samadi Fard and Sayeh Goudarzi, in an article entitled "The study of the quality of open and semi-open spaces in traditional homes and comparing them with the open spaces of contemporary houses" With the library method and observation of existing samples, they evaluated the formation and types of open spaces and also the elements and arrangements that played an important role in the formation of open space in traditional architecture, then these open spaces in contemporary architecture was studied. At the end of the research, they provided suggestions on improving the performance and quality of open spaces.
- Elaheh Esfandiani et al., at the 9th Symposium on Science and Technology Advances in 2014, in an article on the role of traditional semi-public spaces on the quality of designing modern apartments, evaluated and analyzed the traditional patterns and the current status of semi-open private spaces. The results of the research point to the importance of the role of the architect as an appropriate space constructor. In this research, a qualitative method has been used and data collection has been done in two sections of the library study and analysis of the documents of the indigenous houses. According to the pattern of traditional houses in Mashhad and today's houses, there are finally a few alternatives for better and more appropriate design of open and semi-open private spaces.
- At the same conference in the same year, Ali Golparvar presented an article intitled "Evaluating open spaces in residential and apartment spaces", evaluating the patterns of large terraces of the apartments (courtyard) according to the history of the shape of the courtyard, and introduced the factors that make its effect more important.

From this same researcher at the National Conference on Architecture and Sustainable Urban Landscape in 2014, an article entitled "Review of the need for open and semi-open spaces in apartments and residential spaces was presented in which it attempted to explore the benefits of using the large terraces of apartments" The yard is concerned with the life of the inhabitants and the important factors such as the depth and height of the terrace, which affect its impact, are to be evaluated.

- In the 75th issue of the Journal of Human Geography Research, spring of 2011, articles by Hossein Soltanzadeh entitled "The Role of Geography in the formation of types of courtyards in traditional Iranian houses" has been published. The results of this research show how the outdoor formation with the courtyard in traditional Iranian homes has been influenced by environmental geography. The major achievements of this research are the presentation of a new definition of the applied outdoor environment or residential areas of Iran.
- In 2014, at the first national conference on the development of Iran's civil engineering, architecture, electrical engineering and mechanics, Mojgan Jamshidi, in an article entitled "The role of open-semi-open spaces in promoting the quality of residential units", by using the content analysis method, basic Theoretical research has been selected and then, by using the analytical method and logical reasoning, the quality measurement system of the residential unit has been determined and in the final stage, has explained their role in the quality of the residential unit based on the nature and internal and external connections of the open-semi-open spaces. In the end, it was concluded that the physical components of open and semi-open private spaces can play a significant role in meeting the basic needs associated with a residential unit, including physiological needs, safety and security, dependence, dignity and self-esteem, self-fulfillment, and Aesthetic.

Research hypothesis

With the design of open and semi-open private spaces, such as courtyards in the residential environment, it seems to be the basis for individual and collective activities to create a sense of belonging to the living environment.

Research questions

- What is the open and semi-open private real estate area in Residential Complex?
- What are the factors that affect the formation and creation of private spaces?
- Open and semi-open private spaces residential locations are responsible for which residents' needs?
- What are the consequences of the lack of open and Semi-open private spaces in residential areas for residents?
- What is the minimum space required in open and semi-open private areas with limited residential space?

Research methodology

The research is descriptive-analytic and has been categorized by reference to previous researches and library resources and their content analysis. By field studying of the residential complexes located in Rasht and comparing it with Iranian and foreign samples, the standards for designing the residential complex in the form of the mentioned approach can be achieved. Subsequently, a review was carried out of the physical criteria of the research that was used in the design phase.

The history of apartment building and residential apartments

Archaeological studies show that the first tower in the world was built about 11,000 years ago in the city of Eriha, on the east boundary of the Ordon river, the world's oldest ancient city. The staircase of the tower was designed in such a way that the landscape of its highest point, the whole city and the hills overlooking it. Of course, this tower is not intended to be inhabited, but archaeologists believe it is a staircase to reach paradise (Asadi and Amiri, 2012). The last decades of the nineteenth century have been accompanied by the beginning of the general growth of buildings in the West.

It seems that humans have been turned to construct vertical structures for various reasons; one of the reasons for this is the display of power, wealth and authority, and the high cost and lack of land. In ancient Rome, people built buildings with stone and wood floors up a 20-floors building. In the Middle Ages there were houses of three or even four floors. The first large residential complex was built in 1848 in France to accommodate 400 working-class families (Asadi and Amiri, 2012).

On the one hand, this phenomenon can answer many of the urban issues, such as lack of land, housing shortages, and so on. On the other hand, it is a source of problems and other failures. In Western countries, attempts have been made to take advantage of the high level of complexity and control the issues and problems arising from it in accordance with applicable laws and regulations and control the phenomenon. In this effort, our cities are now witnessing the growth and expansion of high-rise buildings on their faces, provided that there is no proper understanding of the importance of the issue and the law and regulations of the controller are also not available. (Saddughean; 1992) There are, of course, disagreements about the world's first tower; some of the "home-building insurance" in Chicago; this metal building was built 42 meters tall and 10 floors in 1885. Some of the other seven-floors building of the central board of the association for the guarantee of fair living, built in 1870 in New York, is known for its first use of skeletal framework as the first tower (Asadi and Amiri, 2012).

The high-rise building is a phenomenon in the world that has taken its place since the late 19th and early 20th centuries, and the first steps in the production of scratches were taken from Chicago around 1880-1900.

The Chicago doctrine is a term used to shape the city of Chicago after the Great Fire of 1871. It was moving along the lines of the 19th and 20th century modernization movement, and the important features of this movement were the rejection of a long tradition in decoration and adornment and it is a simple and purifying and reveal the structure of the building. The Chicago doctrine high-rise building should be considered as the result of two major factors in the technical progress of building construction and the increase in land demand in the central urban texture of the United States. Tall buildings were first used for business, office, hotel and eventually housing for the first time. The result is the growing and denser growth of high-rise buildings adjacent to each other in the cities of America, especially in the central textures of many cities in the world (Saddughean, 1992).

After the doctrine of Chicago, the modernist school can be noted that it reached its peak in the twentieth century and had the greatest impact on the formation of skyscrapers in this century. The ideas of the elders of this doctrine, above all, arose from the poor conditions of the lower classes of industrial urban society. Among the elders of this doctrine are the (Walter Gropius, Le Corbusier and Mises Vandrohe). The general principles of his ideas came from the Declaration of the Athenian Charter, which was presented at the 1930 Contemporary Congress of Modern Architects in Athens. These principles were later compiled by Le Corbusier, which is achievable. The Athens Charter, after mentioning the disadvantages of urban living, finds that the solution to the problem is firmly constituted by urban law that is a provider of urban welfare and justice and supported by the Powerful government.

(Ostrovsky, 1999) In Iran, in the past, there were also high-rise buildings and several floors buildings; for example, in 1271 AH. Within the limits of the city of Bushehr, the buildings of people are two, three, and even four floors, made of fossilized stones and gypsum and sandy cement, sometimes made of straw and mud and lining, and the doors and windows are made of teak wood. They have been completely resistant to termites and moisture, and the construction of copier and non-standard houses in the city limits has been prohibited. (Vadala, 1985) A glimpse into the history of the tallest buildings in Tehran is also good. In 200 years since 250 years of Tehran's history as the capital, the tallest building of the city, was Shams al-Imarah, when the Qajar kings were placed at the top of the 20-meter tower they were watching the whole city, which rarely had two-floors buildings (Asadi and Amiri, 2012).

The beginning of the high-rise building movement in Iran can be called 1949 Hijri Shamsi. Before 1949, the tallest buildings in Iran and Tehran could be considered the building of the Club of Officers, which consisted of 4 floors. The first Iranian high-rise building in Tehran and in 10 floors in the Republican Avenue was built in the years 1953-1942. Then, in the years 1992-52, the buildings of Plasco and two years later, in 1964, a commercial building of 13-floors aluminum was constructed. With the outbreak of the Islamic Revolution the high-rise building was stopped for almost 10 years. During these years, the construction of these buildings was limited to the completion of semi-detached residential complexes.

(Housing Magazine, 2008) Tehran's third tall building, the Bank of Kar, was located in front of the Park on Hafez Street, which was built in 1963 by the Bank of the Bank, and was not commercial, but official. This 19-floors building is 68 meters high. (Asadi and Amiri, 2012). The materials presented here are mostly related to commercial and office buildings, but apartment accommodation is a relatively new phenomenon, dating to about 50 years ago. The largest privately owned apartment building complex, which began in the 50's, was Ekbatan. At the same time, numerous apartment settlements had begun for staff members of the armed forces and government units in Tehran, Abadan, Bandar Abbas, Isfahan, Shiraz and Mashhad.

The first high-rise residential building in Tehran was built on Keshavarz Boulevard, and the three Tahan Towers with 22 floors and 72 meters high, which has been exploited in 1969. At the time of the victory of the revolution, residential buildings (70 meters) and Prince Park (72 meters), the tallest residential buildings and building of the Ministry of Agriculture (62 meters)

were the tallest state building, and no longer was a tall building in Tehran. Behjat Abad collection was also among the first residential apartments in Tehran, which was built between Hafez and Vali Asr street in the 40's. Also, the complexes built in 400 Dastgah Nazi Abad, Shahrziba and Apadana settlements can be named as the first residential complexes. In general, in Tehran, after the 60's, due to the increase in land prices and the beginning of sales by the municipality, apartment building was expanding and developing (Asadi and Amiri, 2012).

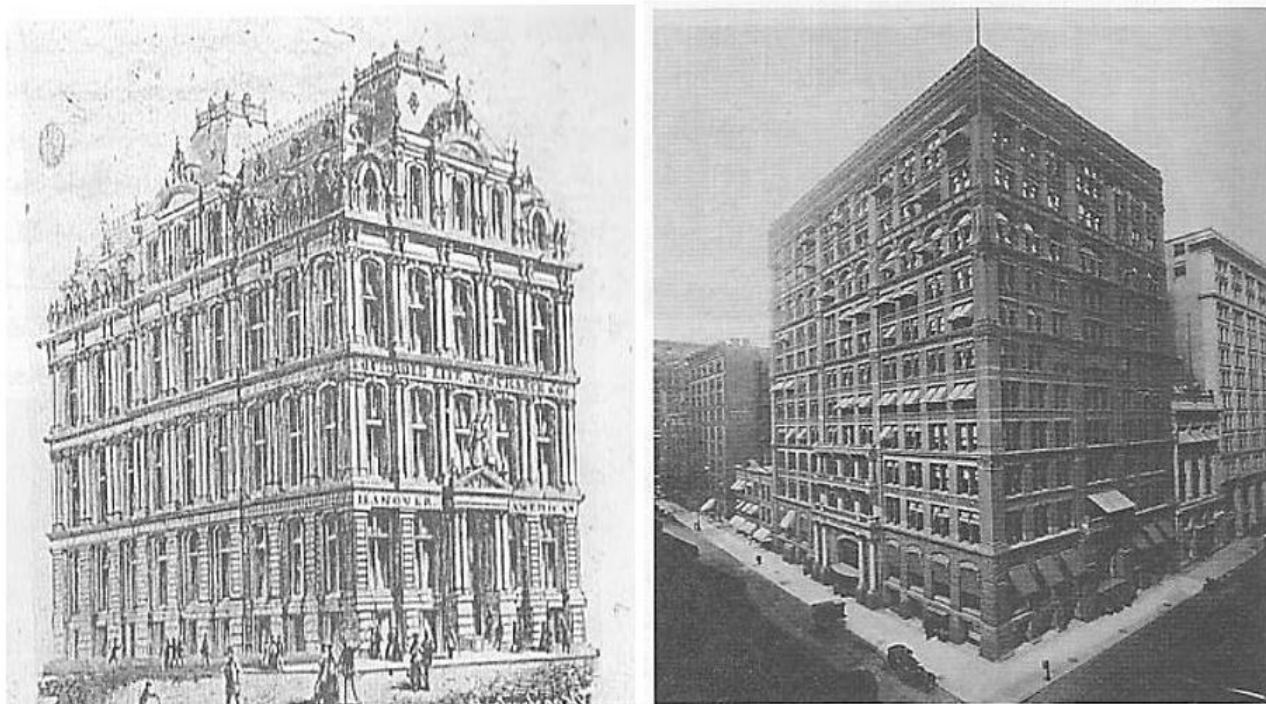


Figure 1. (a) Workers' Residential Complex - France -1848, (b) Home Insurance Building - Chicago-1885 (civiltect.com).

Development factors for apartment accommodation

Supporter's theories of tall buildings and apartments

Supporter's of construction of high-rise buildings, while presenting various views and ideas, have many reasons for the need to use such buildings to solve the current problems of societies. Some of these ideas of constructing high-rise buildings, according to the conditions created in the present century, are a kind of realism and emphasize the benefits of using high-rise buildings. Advantages of high-rise buildings from the point of view of the advocates of this theory are:

- More land use, especially in city centers and densely populated areas,
- A solution to reduce congestion in cities,
- Focusing office and commercial centers and residential spaces at the right places,
- Earn better light and more,
- Appropriate solution for people to settle in big cities,
- Create points of emphasis in cities.

Most of the proposers of this view, while agreeing to the construction of high-rise buildings, believe that such issues as urban shortage, urban development control, housing need and the existence of demand have led to the design and implementation of high-rise buildings as a necessity in current societies (The Fine Arts magazine, No. 55).

As shown in the chart above, in the last 50 years, increased immigration and fertility rates have led to an increase in the population of cities and a reduction in the space required for living, which is referred to as the "housing shortage". From this point on, measures were taken to solve the problem of housing shortage, which not only did not solve this problem, but exacerbated it. The lack of housing on the one hand led to an increase in land prices and, on the other hand, pushed policymakers and officials to thinking. The solution presented was vertical growth of the city, in other words, apartment building. Consequently, the density of sales increased in the 60 decade, which created space and an opportunity for private sector activists in housing construction (Asadi and Amiri, 2012).

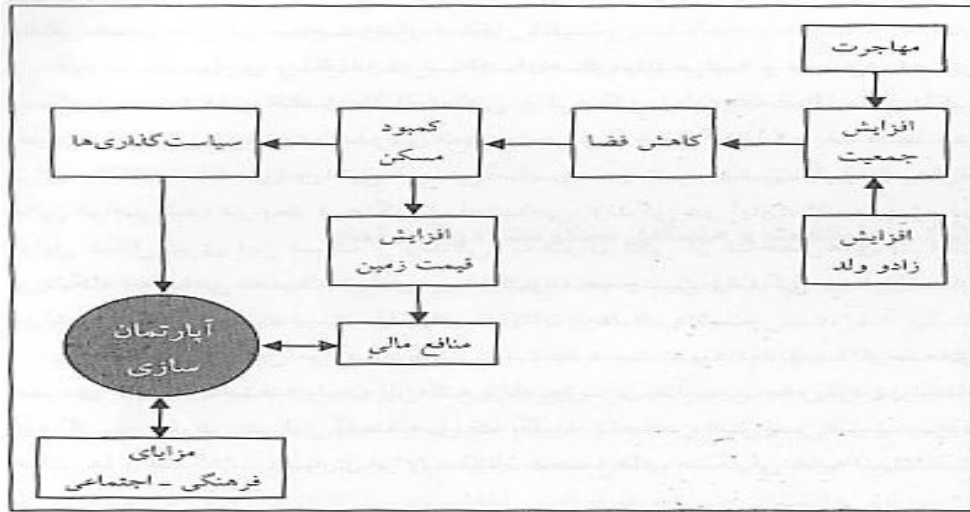


Figure 2. The process of apartment building development (Asadi & Amiri 2012).

The opposition theory of high-rise buildings

The owners of this theory believe that high-rise buildings have degraded the quality of life of the city in various ways and, by violating values and traditions, have created unfavorable conditions in terms of life in the city, and only made it compelled to build. Such buildings will be built in big cities. The problems of buildings from the viewpoint of opposition to the construction of such buildings are:

- Disturbing the human scale in the urban environment,
- Destruction of natural landscapes in city views and landscapes,
- Separating humans from one another and creating fields for crime,
- Infringing the old values and traditions in the city and city's body,
- Excessive crowding and population congestion in specific urban areas (Fine Arts magazine, No.56).

Apartment building and construction of high-rise buildings and residential complexes resulted in many economic, social and cultural consequences, which led to an increase in the vertical development of the city; for example, in the economic aspect, the owners of the villa houses had an opportunity to acquire financial benefits were provided; in the cultural-social dimension, living in an apartment, especially in the early stages of the formation of this style of life, was considered as one of the indicators of wealth and social status; also, life in the apartment offered benefits such as greater security for residents (Asadi and Amiri, 2012).

Middle theories in relation to the construction of high-rise buildings

Owners of this theory accept the use of high-rise buildings under conditions. This group, in contrast to the previous two views, defines high-rise buildings in special conditions. Proponents and believers of this theory, consider the conditions for the construction of high-rise buildings, which include:

- Construction of high buildings in appropriate time and place conditions,
- Construction of high-rise buildings for some specific uses,
- Determine the height of the altitude to build high-rise buildings (Fine Arts magazine, No. 56).

In any case, all of the abovementioned handwritten and led to the development of the city; without proper planning, especially in cultural and legal issues in this regard, that many challenges and problems has been caused for residents of residential complexes (Asadi and Amiri, 2012).

Conclusion: After the industrial revolution, changing lifestyle and social standards of mankind, on the one hand, the increase in the population, on the other hand caused that the design and architecture of housing face with few priorities, such as accelerating construction and minimizing residential space in the lands of city and its qualitative debates, be marginalized such as paying attention to human mental and psychological needs, personal and private activities, sense of ownership and the spirit of the place (Table 1).

Approach	Strategy	criteria
The size of the balconies should not be less than 1.8 in 3 meters.	Having enough space for activities that require open or semi-open spaces	Dimensions and sizes
The design of the balconies and the terrace is sunken	The design of open and semi-open spaces in such a way that in addition to playing its role, for interior spaces, there are other applications.	Influence on the interior
Create multiple openings in common open space and private closed walls		
Intersection of semi-open space openings with other openings of residential units for cooling and air conditioning		
1-Design transparent and wide openings	The presence of a beautiful and suitable view, whether	Intuitive

2-Placing balconies and terraces on lush fronts	inside the units to the balcony or the viewing of these spaces to the surrounding area.	visibility inside
1-Shelter and OKB loud and hard	Creating a suitable space for private activities, away from visual encroachment outside the units	Aristocracy and confidentiality
2-Depth of balcony and terrace		
3-Make semi-transparent or porous obstacles in ways that can be seen from the outside (such as Paraven)		
4-For more confidentiality, we design the balconies and terraces inside, not out		
1-Design of woven and wide openings	Suitable lighting for interial space	Lighting
2-Openings on movable walls open and closed, for lighting		
3-Preferably, the space is designed so that there is no need for balconies and terraces		
1-Evaluate minimum dimensions of communal spaces, such as occupied space by furniture	Design of open and semi-open spaces so that most of its space is devoted to daily activities	Function and application
2-Install adequate space for facilities (preferably hidden)		
3-Allocation of part of the open and semi-open private space to the green space		

Conclusion

Design process

- Considering the shape of the blocks that are T-like; in designing the complex blocks, to create the comfort and tranquility of residents, as well as to preserve the quality factors of residential space, such as audio and visual distances, and to allocate more space to the interior of the units, In each order, a residential unit has been designed, in total there are 3 units per floor.
- For more adaptation of the form with the climate and the possibility of creating more openings for illuminating the units, the blocks are rotated 30 degrees to the northeast and southwest.
- To create visual beauty in the form, as well as to provide the number of residential units in terms of number of households, and on the other hand the possibility of creating large and wide balconies for each unit, for each floor, there is an increase in the amount of retreat in the form.
- In line with the approach of this research, which is in the open the semi-open private fields, each residential unit has a large semi-open space and a number of small semi-open spaces. The existence of these semi-open spaces allows for natural adjustment, the creation of a space suitable for private individuals, and, finally, the possibility of embedding installations in those spaces to prevent damage to the building (Figures 3 and 4).

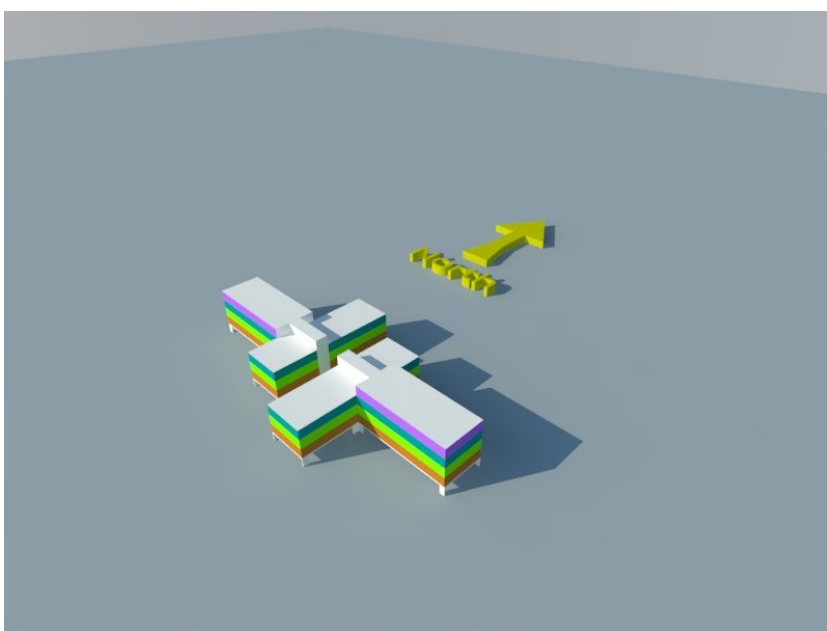


Figure 3. General form and number of classes (original).

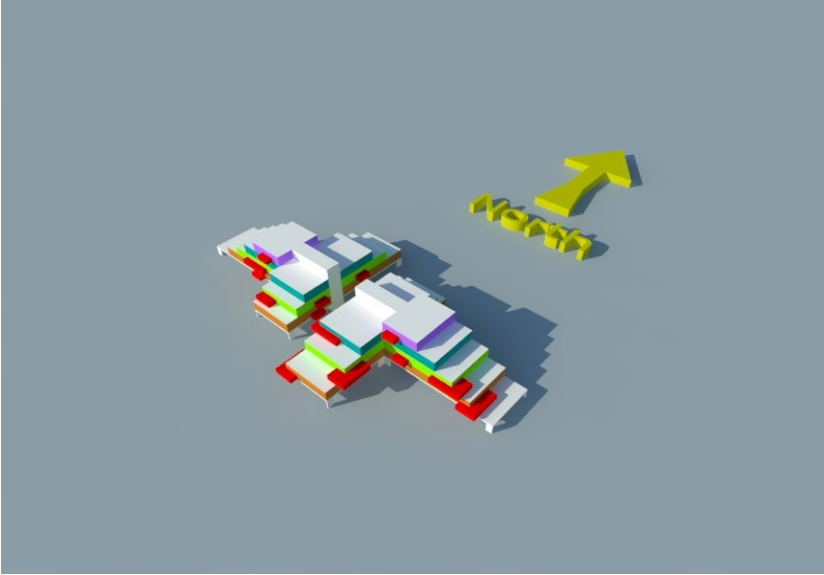


Figure 4. Final form with balconies (original).

References

- Asadi, M. R., & Amiri, M. (2012). *Culture and Life in Residential Complexes*. Publishing House, First Printing, Tehran, Iran.
- Ostrófski, W. (1999). *Contemporary Urbanism: From the First Sources to the Charter of Athens*. Contemporary Translation, Ladan, University Press, Tehran, Iran.
- Soltanzadeh, H. (2011). *The Role of Geography in the Formation of Types of Courtyards in Traditional Iranian Homes*. Human Geographic Research, Sh. 75, Tehran University, Tehran, Iran.
- Saddughean, M. (1992). *High-rise and Urban Space*. Tehran University, Tehran, Iran.

Citation: Mehdi, N. A. (2018). Design of residential complex in order to increase quality of life with emphasis on open and semi-open private spaces. *Ukrainian Journal of Ecology*, 8(3), 349-355.



This work is licensed under a Creative Commons Attribution 4.0. License