An evaluation of factors affecting the quality of life in low-income housing environments

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Abstract

Housing is the second need after food for human beings. Since the housing crisis began with the increase in population, respective governments were forced to construct houses for a large number of families. Ignoring the qualitative aspects of these houses has caused social and cultural harm. Therefore, designers need to pay more attention to the quality of housing and living environments. The main objective of this study is to find the most important factors that affect the quality of low-income housing. In order to achieve this goal, the first stage of the research was to undertake a systematic review of the literature and interview the residents. The housing environment factors were classified in four categories: environmental, functional, formal and semantic factors. In order to give priority to the factors, a questionnaire was distributed among 15 experts (according to the Delphi technique, two rounds of surveys were taken). In the first round, some factors were removed and a new category was added. In the second round, experts gave priority to the factors. Once the data was collected, the next stage was to analyze it. The statistical analysis was performed using SPSS software (version 18; SPSS Inc., Chicago, IL, USA). The results obtained - based on the weighting of each factor - showed that some factors, such as interior space function, volume, relationship with nature, safety and social security are the most effective factors of low-income housing quality.

Keywords: Housing quality, Environment, Function, Semantic, Form, Social factors.

1. Introduction

With the increase in population, the housing crisis began in urban communities including Iranian cities. In addition to increasing demands for housing, other factors such as low quality of housing, changes in building construction technology, cost of urban areas and the spread of alien life patterns intensified the crisis. Improving the physical aspects of life, the respective governments are forced to construct houses for a large number of families. This kind of housing is usually called low-cost housing, low-income housing, affordable housing, social housing, or public housing. Focusing on quantitative and economic factors and ignoring the qualitative aspects have caused social and cultural harm, especially in low-income housing environments.

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Therefore particular attention to low-income housing environment is needed to enhance the quality of life in such areas.

1.1. Housing-environment quality

Promoting the quality of life in different aspects has always been one of the main goals in the different fields of science such as natural and social sciences. Quality of life consists of a set of factors such as health, physical environment, natural resources, personal development, safety and economics. Using the data provided by the Urban Audit program, from the European Union, quality of life is the consequent of nine basic parameters: demography, social aspects, economic aspects, civic involvement, training and education, environment, transport and travel, information society, culture and recreation [1]. According to the definition proposed by the WHO-QOL group in 1993 quality of life is "an individual's perception of his/her position in life in the context of culture and value systems in which he/she lives in relation to his/her goals, expectations, standards and concerns" [2]. Quality of life is a social concept that has no real meaning and it is the people who give it sense and meaning [3]. The concept of quality of life comes from the health issues [2] and it is a yardstick to measure how much the needs of society have been fulfilled [4].

Research shows that the type and quality of housing and its environment have a significant impact on the quality of life and life satisfaction [5]. Quality of life in urban societies has long been the subject matter of theoretical and empirical work in the fields of human geography, urban and regional studies, regional science and regional Economics. These fields usually pertain to the analysis of both objective factors and subjective ones [6]. Thus, quality of housing environments can be explained by the interaction between two patterns: "environment characters" and "residents' demands". Residents' satisfaction depends on the balance between the expectations of residents and the environment's ability to respond to these demands [7]. So it is necessary to pay more attention to producing higher quality housing based on the relationship between the inhabitants and the housing environment. Otherwise, residential buildings will be constructed merely on the basis of economic efficiency. This will reduce the quality of life and cause social and cultural harm, especially in low-income housing environments.

Today, quantitative approaches have been developed in Iran's social and economic housing. Most of the criteria used to evaluate housing and programming needs are quantitative while economic factors and qualitative criteria are considered obsolete [8]. But there are some general qualitative features that appear to be necessary in both small and large houses to achieve the desired quality. So defining the housing environment quality and finding the foundations that can be used in practice are among the most important goals of this theoretical research [7]. To provide solutions for the crisis of residential environment quality, first we must understand the concept of environmental quality and then define the factors that affect it. All these steps depend on the knowledge and opinions of scholars and researchers in this field.

1.2. Quality factors of residential environments

Kevin Lynch proposes livability, meaning (sense), compatibility, access, controlling and observation as five criteria of quality for urban life [9]. Roger Trancik defines these five qualities as necessary in order to overcome space design difficulties, amongst which one can mention hierarchy and space limitations [10]. Coleman [11] introduces livability and variety of use as two important qualities for design. Also Jacobs and Appleyard [12] define livability and aggregative life as factors for design quality. Francis Tibbalds, one of the well-known theoreticians of urban design and master designer of Tehran's Abbas-abad region, states that in order to reach a suitable quality, one should learn from the past and respect the present structure. He also suggests flexibility, legibility, and human scale as solutions to reach a suitable design [13]. Ian Bentley and his colleagues [14] mention factors such as variety of form and function, legibility, flexibility and visual compatibility [15].

Findlay and his colleagues [16] have considered twenty factors of quality in studies about quality of life in British cities, among which medical, educational, sport,

commercial services and spaces for spare times, climate, views and racial homogeneity can be mentioned. Based on a review of seventy cases of urban plans related to forty cities, the design qualities necessary for quality of life can be classified into seven categories: structure, legibility, form, sense of place, identity, views and human scale [17].

Greene mentions components such as security, climate comfort, balance, identity and character, scale and livability. Brian Goodey lists ten components of quality, amongst which flexibility, permeability, livability, legibility and human scale can be seen. Haughton and Hunter introduce variety, flexibility, scale, security and economy as guarantors of a constant city. Nelessen in the U.S suggests variation in use, human scale, designing based on ecology and open space in design as environmental factors for quality [15].

Carmona and Punter introduce the quality of environment in six chapters:

1. Quality of sustainable environment including, orientation, ecology, nature protection, site specifications and construction materials.
2. Quality of urban view including character, structure, sign and etc.
3. Quality of views such as visual corridors, skyline, scene and etc.
4. Quality of urban form including density, mass of volumes, buildings' distance, site specifications and topography, lands use, vicinity.
5. Quality of building form including scale, height, volume, dimensions and type of houses
6. Quality of public open space including access, open spaces, security and prediction of crime [18]

According to Higgins and Campanera's study about the quality of life in seventy three cities across England, ten effective factors on Quality of life were specified, from which community safety, environment, social and economic well-being, community cohesion, statues of housing and transport can be mentioned [19]. The results of Ibem and Amole's research about the evaluation of quality and satisfaction in social housing in Nigeria, shows that the location of housing estate, type of housing, services, social environment, housing unit characteristics (including number and dimensions of rooms, kitchen, service, relationship, construction materials), lighting and ventilation are the most important factors [20]. According to Shirvani's research, environmental qualities are classified into three groups: compatibility, external perspectives and architectural subjects. The third group includes scale, architectural styles, types of roofs, balconies, stairs, construction materials, details of the facade and so on [21]. The area and per capita, construction model, access to the residential services, density of families per unit, numbers of room in each unit and number of people in room are the factors which should be considered in design of residential units [22].

Human consideration, security and safety, privacy, comfort, relationship with nature and equality are desired housing qualities and human scale, hierarchy, introversion, balance and suitable orientation are introduced as design principles [8, 23].

The review of literature about the quality of residential environments shows a great number of elements and related meanings with respect to quality and its components. In order to classify such a variety of different elements mentioned by the experts, a table is devised in which, the different factors are classified into four groups: functional factors, semantic factors, formal factors and environmental factors:

Table 1 Classification of factors of quality in the design housing environments (Source: Authors)

	Quality Factor	Theoretician
Functional factors	Flexibility	[13], [14], [15]
	Permeability	[14], [15], [18]
	Hierarchy	[10], [23]
	Services	[11], [15], [16], [20]
	Security	[15], [19], [23]
	Access	[15], [18], [19]
	Economy	[15], [16]
	Vicinity	[18]
	Density	[18]
	Interior function	[19], [20], [21]
	View	[16], [17]
Semantic factors	Livability	[9], [11], [15], [17]
	Legibility	[13], [17], [18]
	Limitation	[10]
	Public life	[12], [24]
	Place attachment	[17]
	Identity	[15], [17], [23]
	Past relation	[13]
	Safety	[8], [17]
	Privacy	[8], [20]
	Equality	[8], [17]
	Introversion	[8]
Formal factors	Volume	[17], [18]
	Material & Facade	[18], [20]
	Proportion	[13], [15], [17]
Environmental factors	Climate	[15], [16], [18], [19]
	Nature relation	[15], [18], [20], [23]
	Context	[18]

Besides the aforementioned factors, another group called social components affect housing environment quality. In the field of social components, Gruber and Shelton's study can be mentioned. In this study, the effect of some factors such as population density, social correlation, types of residential unit and social security on residential environments are emphasized as important parts of social components [25]. Hur and Morrow-Jones defined more factors such as family, cultural homogeneity, social correlation and security and social safety [26]. Previous studies show that components including correlation, neighborhood relations and social security should also be considered in the planning of residential complexes [27], [28].

Azizi and Malek Mohammadnezhad state that social factors are default components of house planning and factors such as social harmony, cultural similarity, residence's background, services and present facilities, type of family, security, neighborhood relation, cooperation and identity are sub-criteria of social factors [29].

By considering the above mentioned subjects we can conclude that several social factors in different urban and local levels should be considered in house planning. But, what is important in this study, is the effective quality factors on low-income housing in local and sub-local level. Therefore, three quality factors that have been emphasized in previous researches are selected for this study: cultural homogeneity, social security, and social integration.

This research has sought the answers for the following questions: What are the components that cause housing environment quality? At present, what types of quality do low-income people need to have in their housing environment? Which factors of residential environment quality have the most effect on low-income housing?

Therefore, the approach of the present research is to understand the most important factors which promote the quality of life in low-income housing. It is given, that the defined housing qualities, promotes the quality of residential complexes belonging to low-income people and increases the satisfaction of their residents.

2. Research Methodology

The goal of this research is to find the most important factors of quality for housing environment designed for low-income people. After reviewing the literature surrounding the subject and exploring the quality components of housing environments from library sources, documentary studies and the analysis of their content, a classification model of quality factors was suggested.

In order to find low-income people's opinion, the residents of Hashtgerd's Maskan-e-Mehr[1] were chosen as a case study. The researchers distributed a questionnaire and analyzed people's responses. After classifying the responses, twenty two quality factors were considered as a basis for next step of the research. Because of the significance of the subject matter, use of expert's opinions seemed necessary for achieving correct and usable result, and consequently, the Delphi technique was utilized.

The Delphi technique is based on the structural process for collecting and briefing knowledge, from a group of experts in order to accumulate the dispersed questions with controlling reflection of opinions. This process is used for evaluating and analyzing a number of experts. The number of suitable people to form the Delphi group is suggested about 10 to 30 people [30]. Based on this, 15 architects and urban design experts were chosen by purposeful non-probability sampling method and asked various questions in two steps.

In order to describe the questionnaire data in each step, the five point Likert spectrum valuing system has been used. The resulting points for each factor was estimated and analyzed by SPSS software and the validity of the questionnaires in each step was evaluated by Cronbach's Alpha. Finally twelve important components of housing quality was extracted by experts.

3. Research Procedures

Since the evaluated subject is mental and qualitative and is related to human and residential space, direct contact with low-income people and understanding their needs and demands and finding their opinions is necessary at the initial steps of the research. For this reason in this step, fifteen residents of Hashtgerd's Maskan-e-Mehr were interviewed. The goal of this interview is to find the main factors which affect housing environment quality. The subjects provided in the interview are: the location of present residential complex, access, existing and needed facilities and services, public spaces, situation of roads, green spaces, density, security, status and proportions of interior spaces, status of common spaces, view of buildings and other cases which show the present status of residential complex and the residents' suggestions. The residents' answers were collected and were classified.

From twenty eight quality factors inserted in table 1 that were deducted from scholars and researchers' studies, twenty two factors were also confirmed by the residents. These twenty two factors were used for the next step of the research and the six remaining factors that were not mentioned by the residents were put aside – see Table 2.

Table 2 Classification of quality factors confirmed by residents (Source: Authors)

Quality of housing environment			
Functional factors	Semantic factors	Formal factors	Environmental factors
Services Security Access Economy Vicinity Density Interior function View	Livability Legibility Limitation Public life Place attachment Identity Safety Privacy	Volume Material Facade Proportion	Climate Nature relation Context

In accordance with the Delphi procedure, first the initial questionnaire was written and given to three experts, and then after editing, it was distributed among the rest. The Delphi group consists of fifteen architecture and urban design experts, ten with M.A degree and five with Ph.D. degree, who were chosen by purposeful non-probability sampling method and questioned in two steps. These experts have a background of working and teaching in the field. In order to attract the cooperation of the members, the research goals and procedure was described by the researchers.

Table 3 Factors of quality in low-income housing environment, deduced from the first step of Delphi technique

	Factor	Description
Functional factors	Services	Facilities such as commercial, educational, health, cultural and spare time space
	Security	Structural security against the exterior loads, standard material and its resistance to snow, brain and etc.
	Access	Roadway and pedestrian access in the complex and its contact to the city, the location of entrances.
	Density	Mass compression of construction, number of floors
	Interior function	Suitable housing dimensions, proper number of rooms, facilitation of various activities such as eating, sleeping, cooking, working and etc.
Semantic factors	Livability	Possibility of human survival in the environment [9], dynamics, variety of activities [17]
	Limitation	Having visual and functional guard
	Place attachment	Emotion, attention and the contact with the residential environment
	Safety	Self-convenience and suitability of space for contemplation, study, family conversations, rest, relationships with family members and etc. [8].
	Privacy	Being protected of private spaces from visual harassment [8].
Formal factors	Volume	Harmonious construction forms, suitable proportion of the length and height
	Material	Types and proportions of materials used on the facade and interior spaces.
	Facade	Desirable façade design, homogeneity of the building's shells and lack of unusual elements in the facade
Environmental factors	Climate	climatic design and paying attention to building orientation, type of the windows, sustainable factors and etc.
	Nature relation	Use of natural light, favorable winds, trees and etc.
	Context	The suitability of the land in terms of soil resistance against earthquakes, floods and etc, lack of environmental pollution
Social factors	Social correlation	Willing to have relationship with neighbors, responsibility and cooperation of neighborhood residents [26]
	Social security	Social supervision and lack of undefended space [31], security of women and children, safety of passing at night
	Cultural similarity	Cultural authenticity and lack of behavioral conflicts between people living in the complex [32]

To ask the Delphi group's opinion, based on literature review, field studies and interview with residents, a questionnaire concluded of 3 parts was prepared as follow:
- In first part of the questionnaire, experts were asked to evaluate the effect of each component of the table on the quality of housing for low-income people. In order to quantify and facilitate the analysis of data, the questions were provided in a five options span Likert from very high to very low.
- In the second part of the questionnaire, experts were asked to give priority to the mentioned factors based on the rate of effect on quality, in four groups: functional, semantic, formal and environmental factors.
- In the third part, the experts were also asked to provide suggestions on how to improve the framework and to suggest criteria not listed.

After analyzing the data of first step questionnaire of Delphi process, in the second step again a questionnaire with a closed structure along with the classification of quality components, selected from first step of the Delphi process, was adjusted and given to fifteen experts. In this questionnaire, experts were asked to classify the aforementioned components into five groups: functional, semantic, formal, environmental and social, based on the importance of low-income people's housing design. In order to clarify the questions, in front of each index, a short definition was supplied.

4. Result

4.1. Analysis of results for the first step of the Delphi technique

After gathering the first round of Delphi questionnaires, the data was evaluated and analyzed by SPSS software:
A) To evaluate the reliability of questionnaire, the Cronbach's Alpha test was used. At first, this number was 0.537 that randomly by omitting four factors (economy, public life, proportion and view) reaches to 0.717, which is acceptable.
B) Mean, median, mode and standard deviation of each group of functional, semantic, formal and environmental factors were estimated in both parts of questionnaire: first part (Likert) and second one (prioritization).

Table 4 Reliability of questionnaire at first step of Delphi technique

Cronbach's Alpha	Number of items
0.717	19

Table 5 Results of first part (Likert) and second part (prioritization) of experts' questionnaire

		First part (Likert)				Second part (priority)			
		Mean	Median	Mode	Std. Deviation	Mean	Median	Mode	Std. Deviation
Functional factors	Services	4.53	5	5	0.64	4.87	6	6	2.45
	Security	4.67	5	5	0.49	5.40	5	8	2.35
	Access	4.07	4	4	0.59	4.20	4	4	1.57
	Economy	3.67	4	3	1.05	3.73	3	2	2.25
	Vicinity	3.93	4	4	0.96	3.60	3	3	2.20
	Density	4.00	4	4	0.93	4.33	5	1	2.38
	Interior function	4.87	5	5	0.35	6.20	7	8	2.21
	View	4.07	4	5	0.88	3.73	3	2	2.02
	Livability	4.2	4	4	0.77	5.07	5	3	2.09
Semantic factors	Legibility	3.27	3	3	0.70	2.33	2	2	1.23
	Limitation	3.40	3	3	0.83	3.60	3	1	2.29
	Public life	3.93	4	4	0.80	4.40	4	4	1.76
	Place attachment	4.53	5	5	0.64	6.40	6	6	1.55
	Identity	3.40	3	3	0.99	3.27	4	5	1.62
	Safety	4.67	5	5	0.82	6.80	7	8	1.26
	Privacy	3.93	4	5	1.03	4.13	5	1	2.56
Formal factors	Volume	3.60	3	3	1.06	2.73	3	4	1.16
	Material	4.20	4	4	0.68	2.47	2	2	0.74
	Facade	3.33	3	4	0.72	1.60	1	1	0.74
	Proportion	4.27	4	5	0.80	3.20	4	4	1.21
Environmental factors	Climate	4.60	5	5	0.51	2.07	2	3	0.96
	Nature relation	4.20	4	4	0.86	2.33	3	3	0.82
	Context	3.93	4	4	0.70	1.60	2	2	0.51

As is shown in the table, in the first part, mean, median and mode place span from 1 to 5, the higher the number, the more important the factor is from the experts' point of view. In the second part, the factors of each group were classified

according to the level of importance. Mean, median and mode of functional and semantic factors spanned from 1 to 8, formal factors between 1 to 4 and environmental factors between 1 to 3. The higher the numbers of each group the

higher their importance for the experts.

C) Each group of data, based on resulted point from mean in the first and second part of questionnaire, was classified and compared. There were differences between the different parts, but the Wilcoxon test revealed that there was no significant difference between the results of the experts ($Z = 0.642$ and $p = 0.216$). Results showed that in the group of functional factors,

internal space, security and services were very important in both parts of questionnaire. In group of semantic factors, safety, place attachment and livability, in formal factors, proportion and construction materials and in environmental factors, nature relation and climate are more important than other factors in the result of both parts of questionnaire (Table 6).

Table 6 Comparison of results of the first part (Likert) and the second part (prioritization) of experts' questionnaire

Quality of housing environment							
Functional factors		Semantic factors		Formal factors		Environmental factors	
Likert	Priority	Likert	Priority	Likert	Priority	Likert	Priority
Interior Security Services Access View Density Vicinity Economy	Interior Security Services Density Access View Economy Vicinity	Safety Place attachment Livability Public life Privacy Limitation Identity Legibility	Safety Place attachment Livability Public life Privacy Limitation Identity Legibility	Proportion Material Volume facade	Proportion Material Volume facade	Nature relation Climate Context	Climate Nature relation Context

D) Since the difference between the results of the first and second part of questionnaire was negligible, the second part (prioritization) was considered as the basis of the next steps of the research. The final priority of this step is shown in Table 7.

E) According to resulted data from classification and validity test of questionnaire the following results will be gained:

- The factors of economy, vicinity, legibility, and

identity are omitted from table of factors because of low mean in step of valuing.

- As suggested by the experts, a new branch of factors called "social factors" that were ignored in the research was added to the previous factors. In accordance to the provided subjects, three factors of cultural similarity, social security and social correlation, are added to the questioned components of second step of Delphi.

Table 7 Classification of factors of housing environment quality of low-income people from experts' point of view at the first step of Delphi technique

Quality of Housing Environment			
Functional factors	Semantic factors	Formal factors	Environmental factors
1- Interior function 2- Security 3- Services 4- Density 5- Access 6- View 7- Economy 8- Vicinity	1- Safety 2- Place attachment 3- Livability 4- Public life 5- Privacy 6- Limitation 7- Identity 8- Legibility	1- Proportion 2- Volume 3- Material 4- Façade	1- Climate 2- Nature relation 3- Context

4.2. Analysis of results of the second step of the delphi technique

To weigh and analyze responses from second round of the Delphi survey, the data of questionnaires was again analyzed by SPSS software:

A) Mean, median, mode and standard deviation were estimated for each factor and finally each group of factors were given priority.

B) Based on the above tables, the results of the classification of residential environment quality were explained in 5 groups formal, functional, semantic, environmental and social by average of points in the following Table.

C) In order to access the suitable validity of evaluating device, eight components were omitted and twelve final components were deduced, which consist of: accesses, output of internal spaces, cheerfulness, confidence, volume combination, uses and services, contact with nature, social security, and cultural homogeneity.

D) According to the data from the classification and validity test, the following results were obtained:

- Because of having a low mean value the Factors of material, density and limitation, were omitted from table of effective quality factors of low-income housing.

- Based on the experts' opinion, social correlation factor can be combined with cultural similarity factor and a

new factor under title of "neighborhood relations" can be evaluated.

- Place attachment (sense of place) reduced the validity of the questionnaire, since this factor involves a great diversity of quality variables. So, it can be deduced by

evaluating of other components.

E) Findings show that according to the table, twelve factors are more important than others in determining the quality of low-income housing environments.

Table 8 The result of questionnaire of second step of the Delphi technique

		Mean	Median	Mode	Std. Deviation
Functional factors	Services	4.47	5	5	0.64
	Security	4.40	5	5	0.74
	Access	3.80	4	3	0.94
	Density	3.67	4	3	0.72
	Interior function	4.53	5	5	0.64
Semantic factors	Livability	4.13	4	4	0.83
	Limitation	3.47	4	4	0.74
	Place attachment	4.27	4	4	0.70
	Safety	4.33	4	4	0.82
	Privacy	3.93	4	4	1.03
Formal factors	Volume	3.67	4	4	0.82
	Material	3.46	4	4	0.83
	Facade	3.87	4	4	0.74
Environmental factors	Climate	4.40	4	4	0.63
	Nature relation	4.13	4	4	0.83
	Context	3.86	4	4	0.92
Social factors	Social correlation	4.00	4	4	1.00
	Social security	4.53	5	5	0.52
	Cultural similarity	3.53	4	4	0.99

Table 9 Priority of quality factors of low-income housing environment from experts' point of view at second step of the Delphi technique

Quality of housing environment				
Functional factors	Semantic factors	Formal factors	Environmental factors	Social factors
1- Interior function	1- Safety			
2- Services	2- Place attachment	1- Façade	1- Nature relation	1- Social security
3- Security	3- Livability	2- Volume	2- Climate	2- Social correlation
4- Access	4- Privacy	3- Material	3- Context	3- Cultural similarity
5- Density	5- Limitation			

Table 10 The most important factors of quality for low-income housing environments

Quality of housing environment				
Functional factors	Semantic factors	Formal factors	Environmental factors	Social factors
1- Interior function	4- Safety	7- Façade	9- Nature relation	11- Social security
2- Services	5- Livability	8- Volume	10- Context	12- neighborhood relations
3- Access	6- Privacy			

5. Conclusions

In a general look at the most important quality factors of low-income housing environments, five groups of functional, semantic, formal, environmental and social were highlighted as follows:

- In the functional factors, the three factors of interior space, uses and services and access are the most important quality factors for low-income housing environments.

- In the group of semantic factors, the three factors of safety, livability and privacy are the most important factors from the experts' point of view.

- Among the formal factors, the two factors of façade and volume are the most important quality factors for low-income housing environment.

- At the social components factors, the two components

of social security and neighborhood relations are the most important factors from experts' point of view.

According to these results, from the twenty eight quality factors for low-income housing environments, deduced from literature review and the three components that were added in the first step of the Delphi process, twelve factors were defined as the most important and effective indices of quality for low-income housing environments. In other words, the use of these indices for the design of housing for low-income people can guarantee the residential environment quality necessary for achieving satisfaction among the residents. The following suggestions are proposed to improve the present housing situation:

- The needs and daily services of families should be provided in the complex, first aid facilities, educational and spare time space should be established in the complex.

- Pedestrian should be the first priority of residential complexes, walking and driving paths must be separated from each other and also the complex should be in contact with urban services.

- To provide livability and safety, it is necessary to consider the residents' feelings and needs in designs, residential space be suitable for resting, thinking, speaking and contacting with others and friends and variety of activities.

- To protect privacy, prevent the units from facing to each other, and also all privacy of guest, parents and children must be kept.

- For building form, volume and space variety is suggested in the complex. The formal patterns should be familiar and proportionate with the culture of residents.

-The context of the design should be selected in a suitable area, all designed units must benefit from contact with natural surroundings, light, wind and a natural vista.

-In order to establish social security, the possibility of observation in public space should exist and crime prevention can be achieved by refraining from creating empty spaces.

Note

1- Maskan-e-Mehr: A kind of housing project that was built by the government of Iran in order to reduce the price of residential units and remove the land price from the finished price of some units.

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