Formation of a Safe Environment in the Design of Adjacent Territories of an Apartment Buildings

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Abstract. This article discusses the role of the theme “design of living space” in the structure of the course and diploma design of students in the direction of the preparation of the “design environment”. The practice-integrated process of organizing theoretical and practical training at the Vladivostok State University of Economics and Service is focused on real objects, among which one of the most important places is occupied by the organization of living space. As part of this topic, the use of the attic of a high-rise residential building for arranging the attic floor of apartments in order to increase living space for individual families, as well as their functional zoning, which implies the possibility of a full-fledged, comfortable, ergonomic human existence of modern Russian society, is considered.

On the example of the final qualifying work, the authors of the article consider the most important aspects in the design of the attic space of a residential building of an average number of floors.

1. Introduction

The entire housing stock in Russia currently exceed 2.6 billion square meters of total area. More than 10% are residential buildings built in the 50-60s according to standard designs of the first generation. Mid-rise houses were conceived as a solution to the housing problem of the country, the so-called “Khrushchevka”, demolished series were designed for 25 years, and not demolished series - for 50 years, and this period has already expired. For all heat engineering characteristics, they cannot be used. Also, do not forget about the exterior and planning solutions of buildings designed according to currently outdated standards: they do not satisfy either the requirements of comfort or the aesthetic needs of the population. Despite this, the houses are still in operation. The reliability of the vast majority of these buildings does not cause concern and, over the past 35-40 years of operation, virtually no mass-produced residential buildings have come into disrepair, threatening the lives of people. In most regions, territorial reconstruction programs have been created based on which the “Gosstroy of Russia” has launched the program “Reconstruction of houses of the first mass series” of the State target program “Housing”. One
of the real ways of reconstruction of five-story buildings, the "Khrushchevka", is the insulation of the outer walls and, at the same time, their superstructure with attic floors. The construction of the attic floor allows you to organize additional residential premises or apartments on two levels.

2. This work aims to identify current trends in the successful use of the attic floor to increase the options for functional zoning of living space. And also, the formation of theoretical and practical principles of design in the structure of the course and graduation diploma design of students in the field of preparation of the “design environment”. “The educational process is built on the implementation of real projects on orders. The practice-oriented orientation of the educational process forms in students of designers, when carrying out educational projects, basic professional skills. The practical significance of the material being studied is one of the main factors affecting the formation of positive motivation for learning.” [1] “Continuous integrated professional education in modern conditions contributes to the achievement of its main goal - the training of highly qualified, socially and professionally mobile specialists who are competitive and in-demand on the modern labor market.” [2] The research approach is to study the methods and techniques of designing living space. Students in the process of creating the project carry out research and development, experimental research, design, creative activities. The scientific relevance of the problem lies in the need to comprehend the processes of globalization of the urban environment, updating the architectural and design theory in terms of its humanization, a more attentive attitude to human problems.

3. Materials and research methods
Using the examples of course works and final qualification works, the authors of the article consider the most important aspects in the design of the mansard space of a mid-rise residential building. The material for the development of projects to improve housing conditions was chosen apartments located on the site of the fifth floor of the "Khrushchevka". The residents have unique opportunity to significantly increase their precious-valuable living space, without changing the place of residence. Create a new image of one, two, three bedroom apartments providing maximum functionality and comfort of living. Residents of the fifth floor, who received additional square meters due to the second level of the attic floor being built. Or new tenants of the old house who acquired an unusual living space - the attic.

4. Research results and discussion
An attic is an exploited attic space (both residential and non-residential premises), formed on the top floor of the house, or on the top floor of a part of the house, with an attic roof. In the XVII century, in France, the talented architect Francois Mansart proposed the use of attics as a full-fledged living space. In addition to financial gain and functionality, Francois Mansart came up with how to give an uncomfortable room a more aesthetic and decent appearance. This design is named in his honor, the popularity of which does not fade to this day. In this way, the current question is how to most effectively modernize Khrushchevka’s houses, while concentrating not only on economic benefits, but also on environmental issues, energy efficiency, public comfort and aesthetic indicators. Nowadays, 3 options for the reconstruction of the "Khrushchevka" have been developed: The first option, minimization, provides for decorative and heat-protective finish of facades, expansion of balconies and loggias, change of window and door blocks and minimal redevelopment of apartments to create a more rational layout.

The second option, called “maxi modernization”, includes all work on the insulation of facades, as well as redevelopment of apartments within existing borders, bringing their space-planning solutions to regulatory requirements. The most radical option is called reconstruction - the third. It includes all of the above facade work, redevelopment of apartments with the preservation of their type and bringing their qualities to regulatory requirements. This is achieved by increasing the living space due to facade extensions (such as loggias or bay windows); the area of the end rooms also increases. In addition to changing existing apartments, the superstructure of the base house is also made
with an attic or monolithic structures on 2-3 floors. The house is equipped with elevators and garbage chutes [3].

The construction of the attic floor in a mid-rise building, in addition to practicality, gives an attractive appearance to the building itself. The structural elements of the attic add originality to the building in the form of architectural accents: an unusual form of the roof protruding in front of the balcony, roof windows built into the roof plane, giving the building prestigious elegance and special status. The shape of the roof of the attic floor (triangular, broken or asymmetric) affects not only the appearance of the building, but also determines the shape of the interior space. Besides, the presence of an attic helps to reduce heat loss in the house through the roof.

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![Figure 1. “Variations of attic floor”.](image-url)
The entrance to the apartments remains in the same place, on the fifth floor of the house and is the first level of apartments. The presence of two levels makes it easy and logical to zoning space. On the first floor you can place a common area, on the second - private. Compared to an ordinary apartment, the private zone in this case will be better allocated. The space of the apartment is multifunctional, at home a person is resting, working, preparing and eating, having fun, raising children and much more. And the first in the designer’s work is the correct and consistent functional zoning of the entire resulting space. To do this, it is necessary to clarify the lifestyle and needs, take into account the tastes and preferences of each member of the family, which received additional square meters of living space, becoming the happy owner of the attic floor. The error may be in the incorrect structuring of functional zones. Therefore, at the design stage, you need to accurately understand the lifestyle of a particular family: cooking, washing, cleaning, etc., so that each function finds its place. By private zones are meant bedrooms, nurseries, guest rooms. Under the common - living room, dining room, kitchen, lounge, games room, study, sauna, home theater, etc. Incorrect zoning is generally the most common mistake, regardless of the number of levels in the apartment. For example, decisions like exit from the bathroom to the kitchen-living room. A small bathroom on the second level must be foreseen, because constantly running to the first floor is not a pleasant pleasure. Even better (if the area allows) to design a bathroom or shower on the second floor - this is a logical continuation of the private zone. The isolation of private premises can also be attributed to the advantages of two-level apartments. The private part of the apartment must be full, with one or more bathrooms and dressing rooms in the bedrooms. “Students in the process of work use the principles of open design, the quality inherent in any design work, taking into account dialogue with reality, responding to changes in the situation, new design considerations. With these professional skills, students will be able to complete more complex design tasks.” (A. Ermolaev, teacher of the Krasnoyarsk State Art Institute). When designing a two-level apartment, a significant element of filling the interior was added - a staircase, an element of vertical communication. For the device of the stairs, it is necessary to analyze the floor slabs for the correct placement of the entrance to the second level. It is extremely difficult to move the ladder to another place; therefore, it is necessary to treat this process responsibly. In apartments of mid-rise buildings, they are located in a public zone - a living room. On both floors in front of the stairs there should be some free space. In order not to experience psychological discomfort and avoid injuries, this space should not be very crowded. The space given to the stairs and the approaches to it have limited functionality - a hall, a library, a place for relaxation and study. In the under-stairwell space, storage systems for things and books can be placed (Fig. 2). In a small one-room apartment, a staircase with climbing steps is arranged; it takes up less space and looks more elegant. In two-room and three-room apartments, a two-flight staircase is installed, with an inter-flight area. “The swing ladder is more compact. A spiral staircase is the product of a compromise between the need to arrange communication between floors and the desire to save space. To achieve this compromise one has to sacrifice convenience. This option is suitable for fairly young and childless apartment owners. Spiral staircases can most often be found where saving space is a matter of principle, and convenience is of secondary importance (for example, on ships and in technical rooms).” [4]

The style decision of the interiors of two levels depends on the preferences of the customer, the design concept can be single or contrasting, it is better not to mix styles at different levels of the apartment. If the main direction is a classic, then it should be traced everywhere. This single organism in which spaces are interconnected. It is important that the sensations of a person on the first and second floors do not contradict. “In a modern residential interior, successful finds of previous styles are universally used in design in a harmonious synthesis with innovative technologies, tools and forms in design. A single style solution is rarely used. The modern interior is a functional semiotic space, consisting of iconic things. Creating new interiors and exteriors, architects and designers look back at the existing style and images of a bygone era, but not for the purpose of their exact recreation. Consideration of tradition from the point of view of continuity allows us to identify that in the modern design of the living space there is an interpretation of traditional methods of historical styles in combination with the latest technologies and style trends, and there is also a focus with pronounced original artistic solutions, bold experiments.” [5] On the first level, it is usually customary to place...
“public” premises - a kitchen, living room, and others. And on the second there are personal premises.
Design can also obey this principle. Clean and bright solutions for the first floor and made in the same style, but more blurry and softer - for the second. “Conceptual design is good when a conceptual idea is good. Any idea or solution in a conceptual design cannot arise without consciousness of the conditions that influenced its appearance. The nature of the conditions can be understood based on previous decisions. It can be some facts that have taken place, observations, known patterns.” [6]

6. Conclusion
In our country, the mass demolition of the "Khrushchevka" with the development of the liberated territory was recognized as economically justified only in Moscow and St. Petersburg, where it is profitable for developers to make investments in such projects. In the remaining regions, the arguments in favor of the reconstruction of such buildings are outweighed. The fact is that free privatization in our country has created a lot of poor owners. With a lack of funding, the problem of modernization can often be solved only by attracting private capital. Thus, various factors, the situation on the real estate market, the structural system of the building, the degree of deterioration of the building, and the availability of financing influence the solution to the problem of serial buildings. The combining theory and practice, knowledge and experience, transforming all this into a palette of techniques, tools and approaches, applying it in practice. Students' term papers and dissertations allow them to form creative thinking, develop professionally, test theoretical knowledge in practice, and successfully solve set design decisions.

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