



The Processes of Building Panel Residential Buildings in the Cities of Uzbekistan (On the Example of Fergana)

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ABSTRACT

In the article, on the example of the city of Fergana, the construction processes of cheap and high-quality residential houses in the cities of Uzbekistan were analyzed. Also, the differentiation of medium-sized and multi-storey residential buildings by series was shown.

Keywords:

rural architecture, urbanization, public buildings, modern architecture, cultural heritage.

Introduction

In the 20th century, as a result of the rapid growth of the cities of Uzbekistan, medium and multi-story residential buildings began to be built, and their architecture aroused great interest. During this period, scientists have researched and compiled folk experiences of home construction that are suitable and specific to the natural and climatic conditions of the cities of Uzbekistan. For example, Bukhara is distinguished from other cities by its uniqueness and harmony of traditional folk houses in the city and its centres. Their composition is semi-closed and closed, protected from heat, street noise and dust. Such (houses) thatched houses have their microclimate and are cool on hot days. Khiva's traditional folk houses have a special system for creating its optimal microclimate, for example, a system of verandas and courtyards. In the 30s and 40s of the 20th century, as a result of the rapid development of the cities of Uzbekistan, the demand for medium-sized and multi-storey residential houses increased and began to be built. Until this time, medium and high-rise residential buildings were not built in the cities of our republic, and therefore

scientists and architects were very interested in these folk houses. During this period, research and project works were carried out in our republic and tenders were announced. In the first half of the 1940s, for the first time, a competition for medium-rise residential houses was announced for the cities of our republic. The projects of Architect I. Rachinskaya and engineer V. Ozerov were declared the winners of this competition. Based on these competition projects, a series of multi-section mid-rise houses were created and put into development, and they were widely used in the construction of residential buildings in cities. At the end of the 1940s, the 210 series of 2-story multi-section houses of residential buildings typified by the Uzosproyekt Institute was developed and recommended for the construction of urban residential buildings. From the 40s of the 20th century, 3-4-story residential houses were built in Chirchik, Tashkent. These residential houses are designed differently depending on the selected construction site, for example, a 4-story house in the Pushkin district (arch. K. Babievsky). Later, for the cities of Uzbekistan, two-apartment section-type summer rooms and

multi-section houses with double ventilation were designed and built. In the competition announced in the first half of the 1940s, a typical mid-story sectional house designed by engineer V. Ozerov was accepted.

Materials and methods

In the years after the war, Navoi Street of Tashkent city was built with 4-story multi-section houses of this type. (Arch. M.Bulatov, L.Karash, A.Yakushev, I.Rachinskaya, V.Yakushev, V.Arkhangel'sky) In the late 1940s, 210-series 2-story multi-section residential buildings developed by Uzgosproyekt became widespread. The annexation of Central Asia by Czarist Russia had an impact on cities and architecture. Russians (began to build well-designed, new cities next to the cities of Fergana, Kogon, Tashkent, Samarkand, and Andijan.) These cities were built in the European way, with well-planted straight streets and 'laks, designed with ditches. Russians built residential and public buildings in European style. In 1954, 1-262-series 2-3-story residential houses, typed from precast reinforced concrete, with brick walls, were developed. In 1954, a 1-421-serial 4-story building (author. arch. I. Merport, A. Kavalev, engineer. N. Voinov) was built for the first time, with a precast reinforced concrete wall and a summer house porch made of a reinforced concrete frame. buildings were designed. Multi-sectional residential houses of series 1-421 were built for the first time in the construction of micro districts in Chilanzor massif of Tashkent city. In 1958, 1-310 series multi-series residential houses were developed and widely used in the cities of the Republic within 8-10 years. In the creative work of architects and engineers, newly perfected large-panel 4-story typical series houses have been developed. Of them, 1-464 ASP, 1-464-U. USP-series houses were widely used in the construction of the cities of Chirchik, Fergana, Bukhara and Samarkand. In 1963-1964, several new 1Uz-500 USP, TSP, 1-310I, and 1-310TSP series were developed by the system of scientific research and design institutes of Gosgrajdanstroy, in the 2nd period of the typed new series. In this series of houses, the operational and architectural solutions of the

apartments have been significantly improved, and the living rooms, kitchen area and entrance areas have been improved. One of the great achievements in the construction of residential houses in the 1950s was the transition from prefabricated reinforced concrete structures to prefabricated panel houses. In 1961-1962, Giprostroyindustriya TDSK and 1-464-ASP series were redeveloped. The planning of common and living rooms of TDSK-series houses does not differ from brick houses of 1-310 series, the difference is that the summer room - the terrace is connected with the common room and replaced by a loggia. It can be said that 1963-1965 was a period of further improvement of the existing series (1-310, 1-464-USA, 1-464-NSP, 1-Uz-500). Great attention was paid to ensuring the quality of architectural planning and urban planning of the projects. 1-310-I-64 brick-walled residential building (Arch. B.Blyum, M.Akramov, V.Gitberg; designers A.Bocharova, V.Ivanov, L.Gorlitsky, etc.) accepted for construction in 1964 Most of the existing shortcomings of the 1-310 series have been eliminated and improved.

By the 70s of the 20th century, the third period of typed design began, and the development of new typed projects was launched by TashZNIIEP. 4-story 76-series large-panel residential houses consisting of 4 blocks and 18 block-sections, designed for 7,8 and 9-point seismic cities, 5 houses and 8 block-sections for cities with no earthquakes, 7 77-series 4-story residential houses made of local construction materials, consisting of 11 block-sections and 5 houses, have been launched for cities with 8 and 9 points and no earthquakes. Amendments were made to the architectural-planning solution and planning of the houses in these residences, and in proportion to the location of the rooms in the apartments, the entrance to the bedrooms, kitchen, bathroom and toilet areas were greatly expanded depending on the number of people in the apartment. In residential houses of the 77th series, the bathrooms are provided with natural light and direct ventilation, the possibility of separate ventilation of the living rooms and auxiliary rooms was created, and as a result, more

comfort and energy efficiency were brought to the operation process. A large group of architects and engineers worked on the development of the project of these new residential houses under the leadership of the chief engineer of the institute, including S. Rosenblum, R. Kryukova, R. Yanbulatov, N. Musorin, N. Ayrapetov, M. Aksenova, V. Olents and others. It is worth noting that residential houses of the 77th series are not only an architectural-planning solution, but also have a high quality of operation. 2.5% material compared to the 1-310-TSP series; labor and construction costs per m² were reduced. Newly designed houses were tested in the cities of Tashkent, Angren and Dushanbe.

Fergana region is one of the industrially developed regions of the republic. The Fergana region is a high seismic zone. The climate is continental, it belongs to the semi-desert zone according to climatic conditions, and the weather is dry and rapidly changing. The winter is rather mild, sometimes it gets very cold. Depending on the geomorphological shape of the land relief, the territories are divided into zones.

I. formations of the zone: occupied the largest area of the region. 400-750 m above sea level. The climate here is dry and hot, rainfall does not exceed 400 mm.

II. The zone is mountainous: it is located in the southern region of the region. 1000-1200 m above sea level. The climate of this zone is cooler, milder and milder than other regions. Precipitation is more than 500 mm.

III. mountainous zone: located in the south and southwest of the region. Precipitation will be 500-1000 mm. It is surrounded by mountain ridges. Autumn months are mostly clear and warm. The cold morning of autumn corresponds to the 2nd decade of October. Rainfall plays an important role in agricultural production. Average rainfall in flat, dry areas of the region is 160-180 mm, in mountainous areas it is more than 400 mm. Precipitation occurs mainly in the winter season. Rainfall is on average 50-60% per year and varies throughout the year: 35-45% in July, and 76-78% in December. The average annual temperature in zones I and II is 12.5-13.5 °C,

11-12 °C from 800-900 m above sea level. The coldest month is January. The average temperature in this month is below 0 °C. According to Fergana hydrometeorological station observations:

- absolute cold air – 20 °C;

- average summer temperature is between +26 °C.

Absolute hot air in zones I - II +39 °C, in zone III +35 °C. According to long-term observations, the average warm weather (without cold) in Fergana can be 225-230 days. In some years, this indicator can change by 10-20%. The last spring cold falls on the 3rd decade of March. The depth of soil freezing is 0.3-0.6 m, and the topography of the area is complex, decreasing towards the north and northeast. Sizot waters are located 2-35 m above the ground level [5].

The strong "Kokan wind" blowing in the west of the valley has a negative effect on the climate. The wind speed sometimes reaches 35-40 meters per second. Harmsel blows in the southeast in summer. The vegetation period is 210-240 days.

In the regions of the Central Asian republics with dry natural and climatic conditions, TashZNIIEP conducted an experiment on closed composition, which is one of the characteristics of residential buildings. In this regard, he conducted a scientific research experience in a 4-story residential building with a mine in Tashkent. (G.V. Gutkina, Sh.Z. Sadikova) As a result of the movement of air in the mine, there was a large air exchange in the apartments. However, the wind had a great impact on the rooms of the apartments located on the first floor opposite the mine hole. A kitchen facing the mine has been found to have enough light and cool enough air to work during the day. The planning solutions of the rooms have been found correct; the functional connection of the common room with the summer room (veranda) is preserved, based on many years of experience in the design and construction of sectional residential houses in the IV-climatic region, all rooms together with the common room are separately connected to the kitchen and in addition to the kitchen area increased from 5.3 m² to 8.3 m²; Starting from the 2-room apartment, the bath and toilet are

placed separately in all apartments and the quality of operation has been improved. The main way to beautify the exterior of residential houses with the wide use of colours is to draw a horizontal line of white and coloured bricks instead of simple brickwork. The balcony demarcation system has been changed; the same open metal fence was replaced by fully or

partially closed (blocked with asbestos-cement sheets) coloured wooden trellises or trellis fences. The style of each residence is designed in 2 different ways; with a distinctive appearance, small covering coloured bricks, and devices for delimiting the balconies are placed.



Fig. 1. Fergana city, Kirguli district situation plan view

1-464-USP and 1-464 NSP series of large-panel houses in the cities of the Republic and Fergana since 1964 (Arch. Rozenblyum, O. Aydinova, I. Abdulov, L. Rusanova, M. Tokhtakhodjayeva; designers L. Mordvinov, Y. Semenov, S.Rubinov) were built with residential houses, which include 9 types of apartments (4,6 and 8-section houses, detached single-section and gallery-type houses for small families). Compared to the old 1-464-A series, the new series has 2-way ventilation. All apartments do not have connecting rooms, the advantage is that some apartments have 2 summer rooms; the common room and the kitchen on one side of the house and the bedrooms on the other side of the house make the residence comfortable and attractive.

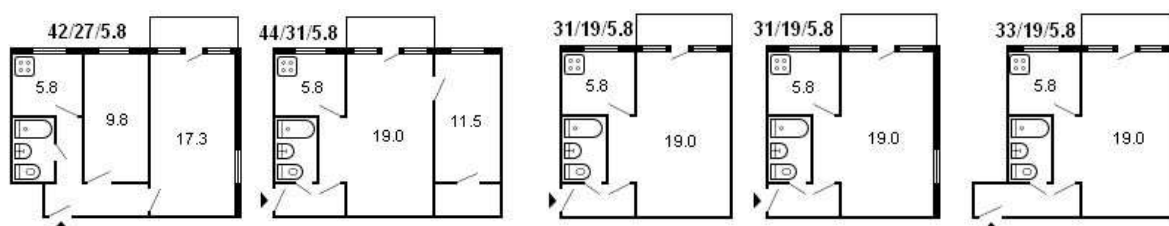


Figure 2. 1-464-USP series panel house

The main beauty of the exterior of the residence is its style of colour gloss and unique wall panels. Architectural plan of houses of the 1-TJ-40-1 series "Ukraine" in the existing TS-7 micro district, 1-310-4-64 series "Leningrad" in the TS-13 micro-district, and residences in TS-1, TS-2 several changes have been made to its structure. Houses of the 1-TJ-401 series in the TS-7 micro district, 2-3-room apartments with "kitchen-summer rooms-common room" are not designed according to the

conditions of Uzbekistan, the main drawback of these apartments is the absence of summer rooms in the common room; Summer rooms are designed in the scale of a short gallery. Behind the railings between the porches on the stairs, there is a convenient place for drying washed clothes, which is not visible from the street. 1-TJ-401 series houses are distinguished from other dwellings by the use of "kabanchik" type of small chimneys. The walls next to the terrace are plastered and painted. The city of Navoi was built in an open area near the Zarafshan River. The city of Navoi is one of the successfully built cities in the practice of urban planning of our Republic. In 1960, the city of Navoi was built based on the project of the Gorstroyproyekt (Moscow) Institute, and later it was given to the Leningrad State Institute for comprehensive design. In 1961, the project of the city of Navoi was created by a group of authors: A. Korotkov, a builder who served in Russia; engineer architects V. Ivanov, I. Orlov. Developed by G. Smoridinlar and approved by Gosstroy. Microdistricts are mainly built with 5-story 1-464, 1V-4,5,6 series houses and 9-story frame-panel construction (1-101-1BG-9 series) houses with galleries and corridors. In houses with galleries, the main part of the rooms is located on the side of the main style, which led to a better orientation (south and southeast). There are 8 two-room apartments on each floor of this type of housing and 2 three-room apartments on the outskirts. All of them have a separate toilet and a large loggia-summer room, the presence of which protects the apartments from the heat of the sun. A separate bathroom with a height of 2.7m (from floor to ceiling) and built-in shelves make the apartments comfortable and cosy. Closed transverse walls between precisely planned apartments keep the noise to themselves.

1Uz-500 series residential houses produced by the republic's housing construction complex (DSK) were built in Tashkent and Andijan, 76th series in the cities of Almalik, Karshi, Namangan, Urganch, Gulistan, Fergana, 146th series in Bukhara and Nukus, 464th series in Samarkand. and in Fergana (these residential houses are all 4-5 stories); Series 148 9-story residential buildings in Tashkent and Samarkand and as an experiment in Fergana. From the point of view of architecture, these dwellings do not differ from each other in terms of location and design. In this case, he brought the cities of the Republic, which until that time had different buildings, into one. Homogeneity destroys any art form. Each big city of Uzbekistan should have its own series, taking into account its natural climatic conditions, architectural traditions and customs. Medium-rise residential houses should meet the natural and social requirements of each city, the diversity of shapes and colours of artistic tools and urban planning factors. 148-series 9-story residential houses have 2 serious disadvantages (TashZNIIEP) 1) the style of the outer wall does not change due to the strictness of the structural solution. 2) The rooms of the apartments facing the main streets are not protected from noise, they are designed with front yards. Starting from the 80s of the 20th century, experimental projects of medium and high-rise residential complexes with wide pictures were completed in the cities of Tashkent, Fergana, Samarkand and Navoi, and construction began based on them.

It is known that during the development of architectural and construction projects of residential buildings, the main goal is to determine the internal architectural size of the building, its functional acceptability, its size and social and functional processes are organized according to the function of the building. This means that people have correctly chosen the solution of spatial-spatial and architectural planning of the building when determining the optimal way of operation. The main requirement for architectural structures is the functional suitability of the building, ease of use and usefulness.

Today, modern urban planning solutions are not a single citizen's building, but a whole composite structure consisting of volumetric and spatial elements that complement each other.

In the planning project of a residential building, regardless of the orientation of it or its sections, it is tried to meet the use of ventilation and solar insolation of the apartments located in them at a certain time of the day ¹.

¹<https://www.google.com/maps/@42.8674796,74.5708881,16z?hl=ru-KG>



Figure 3. Aerial view of panel residential buildings in Kirguli region of Fergana city.

We all know that during the development of architectural and construction projects of infrastructure civil buildings, the main goal is to determine the internal architectural size of the building, its functional acceptability, its size and its social and functional processes depending on the correctness of the building's function. is organized. This means that people have chosen the solution of spatial-spatial and architectural planning of the building in the most optimal way. It depends on how much you use the achievements of science, and the experiences in the field of design and operation.

Conclusion

Despite the great scientific research and experimental design carried out on civil buildings today, there are still many problems that have not been solved. In particular, the analysis of the practice of design and construction of high-rise buildings in the republic showed a number of typological and urban planning problems in the republic: non-compliance with the volume-planning structure of high-rise civil buildings, socio-demographic and local natural climatic conditions; insufficient consideration of the unique way of life and traditions of the local population; limited manoeuvrability of urban planning of high-rise civil buildings; issues of interaction of residential buildings with nature and environment have not been fully resolved, i.e. "human settlement and natural environment" and others.

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