

DESIGN METHODS OF RESIDENTIAL BUILDINGS**Khudayberdiyev Keldiyor Sayitkulovich****Samarkand State Architecture and Construction University**
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Annotation. Each type of residential and public building has its own unique volumetric and planning solution, and their design reflects a highly complex work process. When designing multi-apartment residential buildings, economic factors are primarily taken into account. In particular, the construction of residential houses in Uzbekistan has its own historical traditions. Houses were built in two main styles: national and European. These houses mainly consisted of private courtyard dwellings.

Keywords: residential buildings, architectural and planning solutions, multi-apartment residential buildings, 4–5-storey buildings, geographical environment, Bukhara-style houses, Fergana-style houses, Khiva architectural style.

Introduction. Residential construction has continued from ancient times to the present. From the moment humans appeared, they built dwellings to protect themselves from external influences such as enemies, wild animals, cold and hot weather. A home has always played an important role as a place for rest and work. Over time, the function and purpose of dwellings have improved and expanded. After primitive shelters like tents and caves, residential buildings gradually evolved into the modern, well-equipped homes we see today.

After Uzbekistan gained independence, a significant increase in socio-economic development was observed. With the rise in the population's cultural level and material well-being, demand for public services, entertainment, sports, and commercial facilities also increased. In recent years, the arrival of foreign tourists to our country has grown noticeably. Scientific conferences, symposiums, creative meetings, and visits by foreign scholars, entrepreneurs, and diplomats have intensified. All these factors created objective conditions for the rapid development of public buildings, residential complexes, hotels, theaters, cinemas, supermarkets, cultural-educational and sports facilities.

At the same time, the quality requirements for newly designed and constructed facilities are increasing. The main criteria in designing residential and public buildings include high comfort that ensures productivity, economic efficiency that reduces construction and operational costs, and the creation of high architectural and artistic value.

Literature Review and Methodology. Every type of residential and public building has its own volumetric and planning characteristics. Designing them is a complex process; therefore, highly qualified architects with extensive experience are involved. These specialists understand external natural-climatic conditions and internal functional-technological processes that influence the formation of architectural and planning solutions.

Uzbekistan's regions are divided into climatic zones: mountainous, foothill, irrigated land, and desert territories, each with varying climatic conditions. According to TashZNIIEP institute data, Uzbekistan is divided into three climatic zones:

Zone 1

Regions with extremely hot summers and mild, short winters. Temperature may rise up to 45°C. Due to intense heat, natural protection from the sun is difficult.

Zone 2

Foothill and industrial regions such as the Fergana Valley, Tashkent, and Samarkand. These areas have warm summers and relatively mild winters.

Zone 3

Regions with long, cold winters and cool summers — including Karakalpakstan, northern parts of Khorezm and Bukhara.

Architectural Approaches in Residential Design

National Architectural Traditions. In designing residential buildings, traditional elements such as verandas (ayvons), inner courtyards, ganch wood carving, and decorative painting are used. Traditional shading and ventilation systems are still effective solutions for the climate and are incorporated into modern buildings.

Modern Technologies. Today, innovative construction materials and technologies are used alongside traditional methods to create durable, energy-efficient residential structures. At the design stage, computer modeling systems (BIM) optimize the process and reduce errors.

Harmonious Combination of Old and New

Using traditional elements in modern buildings—such as national motifs and facade decorations—creates architectural harmony. Combining local materials with modern technologies ensures sustainable construction.

Results and Discussion

Geographical environment has always influenced the formation of residential architecture.

- In northern regions, houses were built to protect interiors from cold.
- In southern regions, designs focused on protection from heat and overheating.

Thus, opposite climatic demands produced different structural types of northern and southern Uzbek houses.

Cultural Influence

Local culture and traditions also shaped residential structures. Even in regions with similar climates, architectural forms differed according to local customs and lifestyles.

Traditional Uzbek House Types

Uzbek traditional houses are divided into three main types:

1. Bukhara-style houses

These houses were densely built, with rooms facing the inner courtyard and not the street. They created a cool microclimate inside the yard.

2. Khiva-style houses

Similar to Bukhara houses, but had two verandas placed opposite each other. The taller northern veranda directed cool northern winds into the courtyard.

3. Fergana-style houses

These houses lost their closed-yard character. Instead of inner courtyards, verandas faced gardens. Verandas often had glass frames, allowing year-round use.

Principles for Choosing Residential Types

Key factors:

- demographic composition of the population
- family traditions and occupations
- construction site conditions
- natural climate
- available construction technologies

Conclusion

For each city, district, or village, the demographic characteristics of the population determine the appropriate residential type. Uzbekistan's population growth rate is about 3% per year, and large families are more common in rural areas.

According to settlement patterns, residential buildings are classified into two groups:

A) Houses divided into apartments

Designed for families living separately.

B) Houses divided into rooms

Intended for single residents using shared services. These include:

- dormitories
- worker hostels
- student accommodations
- boarding schools
- hotels and guest houses

Apartment-based housing forms the main residential stock of cities and rural areas.

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