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# **Planning and Orientation of Housing in the Climatic Conditions of the Republic of Karakalpakstan**

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**ABSTRACT:** The article describes the construction traditions of the Republic of Karakalpakstan, taking into account the existence of the climate, conditions, landscape and natural materials of the site.

**KEY WORDS:** landscape, architecture, old town, inner iwan, outer iwan, building, thing, dry wind

## **I. INTRODUCTION**

In the lower reaches of the Amudarya River, the architecture of buildings has ancient traditions.

The architecture of accommodation developed under the influence of socio-economic conditions, climate and living conditions of people. Home style and form in the national architecture develop under the influence of the environment, nature, climate and conditions. The climatic conditions of Uzbekistan are mainly divided into three parts. These are deserts, valleys, mountains and highlands.

The first area includes the areas affected by the desert climate. These territories are defined as IV A climatic zones during the former Soviet Union. The Republic of Karakalpakstan and the Khorezm oasis are included in IV A climate zone. The climate of this region is characterized by dry and hot air temperatures, and winter is long and cold.

By their nature, housing is designed in accordance with the climatic conditions. In addition, building materials used in residential architecture are also derived from its natural resources. For example, in the Khojeyli district, there were piles of raw brick in the villages, and in the old town, there were cracked walls. In these areas, people sought to protect the premises from the hot air in residential architecture. For this, they tried to build houses in a closed courtyard. Some rural homes are an example of these two (internal and external) parts. They are wrapped in thick and high walls. The outer courtyard is surrounded by utility rooms. There are three or four rooms in small households, and rooms are located in wealthy families. They had more than one family. In the courtyard, there is one or two terraces for each family.

In the traditional Khodjeyli house, the rooms are divided into winter and summer groups. The group of summerhouses consists of high-altitude towers in the north and northeast. These houses rose far above the roof and are designed to block the winding path and head to the yard. It should be noted that in these places, summer is also the result of indoor cooling, the presence of shelters in warm weather in winter, and the influence of other factors, in addition to the allocation of premises for the winter. In particular, the most frequently used building materials, the pale wall, slowly penetrated in the summer in the summer. In winter, the room was kept for a long time in the room.

A cleaned poplar was placed on the roofs of the houses, sludge logs were placed on it, a reed wicker was laid on it, and then it was all poured with clay. After the clay dries and cracks, a mixture of clay and straw is prepared and the roof is coated. In these places, in ancient times, reeds were used both as a foundation and for roofing houses. Reed is widely used in folk architecture as a thermal insulation material and material impervious to salinization. According to Uychi Bobotoya, who lives in the old town, in some houses, including in the house of his father in the old house of Uychi Nazarbay, on the floors of the rooms lay a soft brick.

Under the floor, escaped holes for the storage of vegetable products. Also, to maintain a cool temperature in the basements under the room dig holes. For a long stay of warm air in the winter room, its poly are made lower than in other rooms. It was especially important that the room was cool in the summer, warm in the winter, so that the windows were oriented towards sunset, the size of the windows was of particular importance. Also of particular importance was the size of the walls of the rooms, their orientation towards the sun, also in many places, the short wall of the house in



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many places is directed in the direction where the wind blows. This measure was also taken to protect the rooms from sunlight.

Trees were planted on the sunny side of the house to protect the house from the heat. They also paid attention to the fact that the rooms were small. The combination of rooms in old town houses also plays an important role in maintaining normal room temperature.

With the growth of children, next to the old house, in the same row, leaving some free space, new rooms were built. This is how the streets of the old city of Khodjeily are formed. Narrow streets bordered on both sides by residential buildings helped protect the environment from cold winds.

In the Old Town, the style of the houses, the general appearance and composition were distinguished by their simplicity.

In many cases, high-low walls of houses appeared on the street.

The composition of the courtyard of the house of Bobotoy Uychi and Saidjan Bazzoz is decorated with a large veranda, high carved column (Picture 2).

The traditions of folk architecture on the example of Khojeili should be reflected in modern homes, which should take into account the lifestyle, national culture and social conditions of our people. In addition, modern house designs should take into account the climatic conditions of our region.

According to building codes, one-way windows of living rooms should not be directed to sections 2150 to 2950 (Fig. 1, section A) and from 450 to 1350 (Fig. 1, section B).

In such houses, the windows of rooms can be oriented to sectors from 450 to 1350 only if there are sun-protection devices or provided they are under the shade of the trees. (Picture 1).

In two-room houses with windows facing the opposite sides, it is allowed to direct the windows of one of these rooms to the above sectors, if the house is three or four-room, you can direct the windows of two or three of these rooms to the above sectors. In houses with galleries, the windows of the living rooms should be directed south. In order to improve the planning of residential areas based on local requirements, according to the long-term experience of the Tashkent Institute of Design and Study of Residential Premises (TashZIIIEP), in the conditions of Uzbekistan, personal living rooms consist of the following groups of rooms: individual living rooms, living room, personal hygiene rooms (bathroom, toilet, premises for storage and placement of household equipment (warehouse, cellar), storage rooms (kitchens, warehouses, laundries), premises for food storage.

In planning the composition and layout of the courtyard, which consists of these groups of rooms, in their design it is necessary to take into account the natural and climatic conditions of the republic, the socio-demographic factors of the population, families with many children, traditions, families' lifestyle, etc.

Due to the fact that in the Republic of Karakalpakstan summer is hot and winter is cold and difficult, and the family needs to have a courtyard that has a cozy climate zone connecting gazebos to the courtyard, ventilation of the main rooms is also required.

One of the main problems of housing architecture is improving the organization of life in the house.

According to the Official Building Norms and Rules (SNiP), summer rooms of houses are usually used as a balcony, living room, patio and as an architectural tool for their artistic and aesthetic appearance. However, these comfortable rooms can not fully meet the summer life of families in a hot climate.

The main purpose of the summer rooms is to facilitate the performance of household work, the creation of favorable bio-hygienic conditions in the house, tying rooms to the external environment, with sunlight and fresh air. Checking the summer rooms and the microclimate of the courtyard, and comparing them with the results of other studies shows that the presence of the courtyard in the house and the convenient location of the summer rooms in them provide an increase in the temperature of hot air to 100 ° C and an increase in humidity of 20-25%.

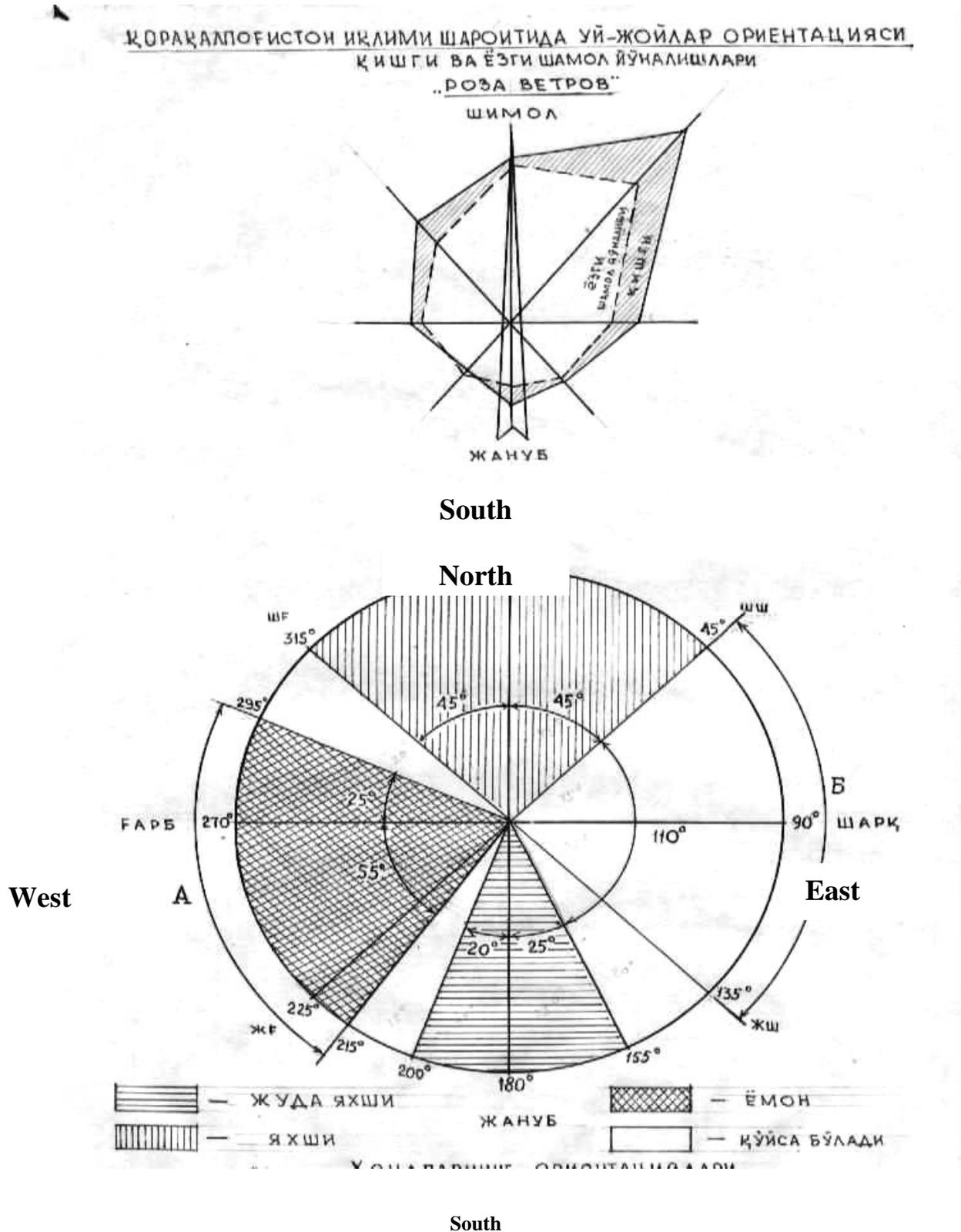
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#### Direction of winter and summer winds

«Winddirection»

North



Picture-1. Room orientation

