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Аблаева Угилой Шодикуловна
старший преподаватель кафедры «Строительство зданий и сооружений», ДжизПИ.
Досалиев Канат Серикұлы
PhD, доцент заведующий кафедрой "Промышленное, гражданское и дорожное строительство" Южно-Казахстанского университета им. М. Ауэзова
Юнусбоев Бехруз Азиз угли
студент группы 201-21 «С З и С», ДжизПИ.

EFFECT OF BUILDING STRUCTURES ON BUILDING ENERGY EFFICIENCY

Abstract: *The article analyzes the current state of problems arising in the design of roofs of low-rise buildings. For this purpose, various design concepts are considered, based on which roof structures are created. As one of the elements of the implementation mechanism of these plans, specific examples of energy-efficient roof design are provided.*

Key words: *construction, energy-efficient, climate, energy consumption, construction of houses, heat energy, design.*

СТРОИТЕЛЬНАЯ ЭНЕРГИЯ СТРОИТЕЛЬНЫХ КОНСТРУКЦИЙ ВЛИЯНИЕ НА ЭФФЕКТИВНОСТЬ

Аннотация: *В статье рассмотрены вопросы проектирования крыш малоэтажных зданий. Анализируется современное состояние возникающих проблем. Вот и все для этой цели рассматриваются различные концепции дизайна, они на основе чего создаются конструкции*

крыши. Реализация этих планов энергосберегающий как один из элементов механизма приведены конкретные примеры конструкции кровли.

Ключевые слова: *строительство, энергоэффективность, климат, энергопотребление, дома строительство, теплоэнергетика, проектирование.*

Energy saving is becoming one of the urgent issues from year to year. The limitation of energy resources, the high cost of energy, the negative impact of its production process on the environment, all this requires energy conservation and finding a solution to the problem in the conditions of limited resources. In this direction, scientific and practical work is being carried out in the world on reducing energy consumption, effective use of new, alternative energy sources.

From November 4, 2016, the Paris Agreement on global climate change will enter into force, which aims to ensure that the average temperature of the planet Earth does not exceed 2ºC, move to the stage of carbon-free cities, and reduce SO2 emissions. According to UN data, in 1950, 30 percent of the population lived in cities, and in 2015, this figure increased to 54 percent. Projections show that by 2050, 66-70% of the population will live in cities. Currently, about 15,964 million (51%) of the population of Uzbekistan live in cities, and the remaining 15,612 million (49%) live in rural areas. According to information, Tashkent is the leading city in terms of population among large cities in Uzbekistan, with 2 million inhabitants. 353 thousand people live there. 49% of all energy consumed in Uzbekistan in one year or 17 mln. tons of oil equivalent corresponds to the contribution of buildings. Energy saving issues are neglected in the design and construction of buildings, which leads to excessive energy consumption. It is known that the majority of our population, i.e. 76.8 percent, lives in low-rise houses.

This means almost 24.6 million people. Unlike high-rise buildings, the heat energy system supplied to low-rise private residential buildings is decentralized,

and the variety of design solutions leads to an increase in the factors affecting their energy consumption. Rapidly growing urbanization processes, a sharp increase in the number of people in cities cause a shortage of construction land.

For this reason, today, many state and non-state design organizations offer to design a cozy and comfortable mansard floor at the design stage of low-rise residential buildings. This is certainly an acceptable architectural-artistic solution. But in the territory of our republic with dry heat and severe continental winter conditions, turning the attic part into a living room is achieved at the cost of increasing energy consumption several times.

Increasing the energy efficiency of the roof structures of low-rise buildings, reducing the energy consumption of the attic part, and in this direction, the thermal-physical solutions used in the conditions of Uzbekistan, the use of solar panels in this regard, and their economic efficiency have not been thoroughly studied.

In the design of modern low-rise residential buildings in a dry hot climate due to the limitation of traditional energy sources and their price increases year by year, the increase in costs, especially during the operation period, energy efficiency issues of the attic roof construction, which requires a thorough study of the economic efficiency indicator of solar energy solutions.

By improving the energy efficiency of the roof structure of a low-rise building, it is possible to increase the overall energy efficiency of the building and thereby save energy consumption.

From a number of studies carried out in this direction[1], it became clear that the main aspect in the energy efficiency of the roof is the location of the thermal insulation material. Incorrect selection of the mutual location of the layers of the roof structure has a direct impact on the non-reduction of heat loss, and requires alternative solutions for the temperature and humidity regime.

In 1983, Tashkent was the first in the former Soviet Union to achieve a reduction in energy consumption by 40-50% per year as a result of experimental

experiments with a heating system using solar water heaters placed on the roof [2].

"Designing energy-efficient buildings under the conditions of Uzbekistan" [3] covers the issues of energy saving in the design of social sector buildings and residential houses. Traditional and unconventional energy sources, their use in the conditions of Uzbekistan, ways to increase energy efficiency of heliobuildings, them citing the technical and economic basis of the choice of options, in matters of energy saving and energy efficiency of buildings examined separately.

In conclusion, it can be said that creating comfort conditions on attic roofs in dry and hot climates, improving the technology of assembling the building materials that make up the roof structure, improving the energy efficiency of the roof structure in exchange for implementing measures to reduce the energy consumption of the structural elements of the building, and in this way, the building is to increase the overall energy efficiency indicators. This provides an opportunity to use new energy-efficient design and technological solutions in construction practice.

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