

STUDY AND ANALYSIS OF STRUCTURAL SOLUTIONS OF ROOFS AND ROOF COVERINGS OF RESIDENTIAL BUILDINGS IN THE CONDITIONS OF KHORAZM PROVINCE

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ABSTRACT

This article analyzes the study of constructive solutions of roofs and roof coverings of residential buildings. In addition to protecting buildings from atmospheric precipitation, roofs perform the task of keeping the room temperature at the same level in winter, and keeping it from overheating under the influence of the sun in summer. It consists of the covering part of the roofs and the structures that carry the loads (permanent and temporary) falling from them.

Key words: *construction, roof section, durability, control, layer.*

АННОТАЦИЯ

В данной статье проведен анализ исследования конструктивных решений крыши и кровельных покрытий жилых зданий. Помимо защиты зданий от атмосферных осадков, кровли выполняют задачу по поддержанию температуры помещения на одном уровне зимой, и сохранению его от перегрева под воздействием солнца летом. Он состоит из кроющей части крыши и конструкций, воспринимающих падающие с них нагрузки (постоянные и временные).

Ключевые слова: *конструкция, сечение крыши, долговечность, контроль, слой.*

INTRODUCTION

Roofs must meet the basic requirements. They should be able to withstand permanent (own) and temporary (snow, wind and other loads during use). The covering part of the roof must be waterproof, resistant to moisture, aggressive chemical substances in the air, solar radiation, cold, solar heating, not drying and not melting. One of the main requirements for roofs is that they should be



inexpensive to install and use. At the same time, in the construction of roofs, it should be possible to use industrial methods that lead to reducing labor costs, increasing labor productivity and improving the quality of construction and assembly works. According to the results of the experimental work conducted by scientists, it can be widely used in the construction of waterproofing materials.

DISCUSSION AND RESULTS

The roof consists of several layers based on rolled waterproofing materials, uncoated types are used for the lower layers, and coated types are used for the uppermost layer. The outer side of the packing material used for the top layer is sprinkled with large-grained (K), fine-grained (M) or powder (P) minerals (sand, crushed stone). In addition, coin-shaped packing materials are also produced. Tombop waterproofing mastics are used for waterproofing roofs, building structures and as an adhesive material. They are made on the basis of tar and rubber-bitumen binders, have high elasticity, flexibility, frost resistance.

Ruberoid sheets and glass - used from Soviet times to the present day. They create the cheapest roof, which affects its service life - about 3-5 years and the installation method - at least three layers.

Rubemast - This is an improved version of the roofing material described above and is distinguished by its installation technology - it does not wash off, but is absorbed into the surface. The service life does not exceed the performance of the previous one.

Euroruberoid –it is distinguished by its resistance to sharp temperature fluctuations and cold. It is applied in 2-3 layers, lasts about 30 years (read:



"Euroroofing material - laying technology: installation process").

Membrane roll materials - Modern roofing materials that are easy to install and work for a very long time. On the market, after removing the film from the adhesive base, it is presented in the form of self-adhesive clothes, which should be laid in warm sunny weather. The high price is justified by installation without nails and sealant.

Installation of the membrane is carried out in two ways:

mechanical - dowel, in the seams of the canvas with the help of fungi,

ballast - this is to prevent the canvas from being blown by the wind, after welding the seams, it is loaded over the entire surface of the roof. For example, if there is an exploitation of the roof, a layer of gravel or paving slabs.

Glass ruberoid-glass is made by sprinkling a bituminous binder (bituminous rubber or bituminous polymer) and mineral powders on both sides of the fibrous fabric. According to the type of material to be sprayed and the field of use, glass ruberoid is produced in the following brands: S-RK (large-grained spraying), S-RCh (coin-shaped spraying) and S-RM (powder spraying). Glass ruberoid is used in the upper and lower layers of roofing and in waterproofing of structures. The resistance of fiberglass bases to chemical and biological environments extends the service life of wrapping materials made on their basis up to 30 years.

Also, hot bitumen-mineral mastics are made by adding 30-64% of mineral powders to the bitumen binder. They are used as a cast composition for sealing the seams of construction structures, hydrotechnical structures.

Cold asphalt mastics (khamast) are prepared by mixing bitumen-lime paste with mineral powder in a cold state. They are used in cold waterproofing and sealing deformation seams.

Hydrophobic gas-asphalt bituminous-lime paste is added with 10-15% portland cement and aluminum powder (powder) to create gas. It is used in the preparation of complex roofing panel constructions and heat-hydro-insulation of pipelines. Houses should be easy to operate even during renovation. We determined the needs of repairing the roofs of the houses in the conditions of our region, and taking into account the data, the initial source of information is the questionnaire of indicators of the need to repair building structures for each house, which includes the passport of the house, the names of 12 structural elements and the amount of necessary repairs. In addition, information on the years of construction and the last major renovation of the houses was collected.

The questionnaire made it possible to immediately determine the total volume of repair technology measures for all specified structural elements. But in many different constructive solutions, the reasons for stopping can be different. This requires a serial analysis of the state of houses, their constructive solutions and methods of construction technology.

First of all, taking into account the last capital repair, the analysis was carried out depending on the size of the repair activities from the period of use of the houses. The analyzes revealed a rather weak correlation between years of construction, recent

major renovations, and the amount of renovations needed. This happened as a result of the following reasons:

1. Inaccuracy of information, which may have been obtained at the initial stage (incorrect filling of questionnaires);

2. Factors affecting the quality of construction:

a) climatic - determining the location of buildings according to the uniqueness of the construction, light aspects;

b) physical - technical - characteristics of construction materials, priming materials;

v) the uniqueness of production, storage, transportation, assembly technology in technological-preparatory enterprises;

d) social - qualifications of construction workers, various construction organizations involved in construction and repair, etc.

s) Personal (subjective) evaluations of defective residents themselves and with experts on use.

Thus, the analysis of the condition of roof structures according to the criterion of need for repair is a function of a large number of arguments, most of which do not allow for formalization.

At the next stage of the research, information on the need for repair of more than 100 buildings was obtained for each structural element (basement, frosting walls, seam sealing, roofs for transition to the roof, partitions, etc.). More than 10 series of diagrams have been compiled according to the year of the last major overhaul.

Computer programs for problem solving were analyzed and studied.

In order to solve this problem, an equation was created for each series, the number of houses not requiring major renovations, the number of houses in major renovations, and the sum of the rejected values:

$$P_o = \sum_{m_2=1}^{m_1} \frac{Pm_2 K}{Y}$$

Here: m_1 - total number of houses; m_2 - Number of rejected houses;
 K – iteration coefficient; P_0 - The quoted value of rejection;
 P_{m_2} - rejection value; Y – divisor type.

Indicators of the need for repair are given per unit area or number of apartments. To verify the accuracy of the obtained data, the laws of mathematical statistics were used, according to which the sum of the data used should obey the normal

distribution law, which was verified by using the Pearson (χ^2 - criterion) criterion and the construction of the Gaussian curve.

In order to determine the relationships between the volumes of repair activities and the structural solution, the diagrams of the indicators of necessity in the repair of soft roofing and transitions through the roof, averaged by the type of structural solutions of the roof, were made.

At the design stage, it is very important to prevent defects or damages that may occur during use in external wall structures, roof coverings, partitions, curtain walls, and the like. For this purpose, information on the durability of structures of large panel buildings of various series is necessary. These experiments were carried out on the basis of information from the Tashkent Institute of Architecture and Construction, where materials were collected about the need to repair construction structures and engineering equipment of residential buildings. Comparison of design solutions of different series of large-panel buildings made it possible to identify the shortcomings during their design and construction.

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