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PROBLEMS OF HARMONIZATION OF OPERATIONAL FEATURES OF LOCAL RESIDENTIAL BUILDINGS

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----------ABSTRACT ----------
The article shows that insufficient attention is paid to the issues of heat storage and seismic resistance in the individual construction of individual buildings, the heat-retaining materials used in these buildings have a porous structure, and therefore the relative strength is much lower than in dense structures. It is recommended to build load-bearing structures from high-strength materials, such as steel, reinforced concrete, wood and composite materials, and to restore the retaining wall and roof structures from porous materials. **----------**

INTRODUCTION

One of the main problems in the current development of housing construction is to reduce the consumption of fuel and energy sources, in this regard, saving energy used not only in the production of building materials, but also in the operation of buildings and structures to heat them.

Currently, about 35% of the total energy resources are used to heat buildings and structures. Compared to European countries, CIS countries consume 2-3 times more energy per single dwelling area. Similarly, in Russia, the heat consumption in multi-storey residential buildings is 350-550 KWh / (m2yil), while in cottage-type detached houses this figure is 600-800. In Germany, for example, in the courtyard type buildings consume an average of 250 kW h / (m2 year), in Sweden -135 kW h / (m2 year), in the highest quality foreign residential buildings consume 90-120 kW h / (m2 year) /2/

OBJECTIVES

It was found that the specific heat loss of the conditionally obtained housing is as follows: through the wall - 36%, through the window - 24%, from the window openings with infiltrated air space between them - 37%. On other values: through the wall - 45%, windows and doors - 33%, between the roof and partitions - 22%. In order to reduce heat loss according to these values, first of all, it is necessary to equip the walls and partitions of houses with heat-insulating layers.

Great attention is paid to increasing the thermal resistance of barrier structures around the world and in the CIS countries. For example, the decision of the State Construction Committee of Russia of March 25, 1994 prohibits the use of single-layer panels made of material with a density of more than 900 kg / m3 in the construction of prefabricated reinforced concrete residential and public buildings in order to save fuel and energy. It is recommended to replace the panels. From September 1, 1995, paragraph 3 of the SNiP II-3-79 "Building heat engineering" construction norms and rules was amended, which provides for a gradual increase in the thermal and technical characteristics of barrier structures.

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METHODOLOGY

In the first stage, by increasing the coefficient of resistance of walls to heat transfer from 1.16 m2 S / W to 2.2 m2 S / W, the heat consumption in modern buildings is reduced by 17%. The requirements of this stage are met by thermocoupled three-layer expanded clay-concrete panels made of expanded polystyrene concrete slabs.

For three-layer panels, the use of concretes with a medium heat-density density of 300-500 kg / m3, compressive strength of 0.5..2.5 MPa is effective, and their thermal conductivity is 2.5 .. 4 compared to the single-layer lightweight concrete used. times are required to be low. In these cases, traditionally used fillers (perlite, expanded clay and its types), amorphous (porous) layered structural fillers (penosteklogranulyant, azerite, barotelite, diolite and steclosite) can be used, whose thermal conductivity is obtained from crystalline structures, wood and agricultural waste. and 25-30% lower than foamed polymer granules.

STATISTICAL DESIGN

The thermal storage properties of three-layer panels in the middle layer of concrete can be increased by 20-30% by using active additives such as low-energy clinker-free or low-clinker binders obtained on the basis of industrial waste or mountain-volcanic effluents (tuff, pumice, volcanic slag, etc.) instead of portland cement.

Factors arising from the point of view of operational requirements, to increase their resistance to thermal conductivity by 2-2.5 times, reduce material consumption, even if the thickness of the walls and roof (2-3 times) is reduced due to the thermal resistance of the thermal insulation layer during the application of three-layer barrier structures. that is, a moderate heat-humidity regime is achieved in rooms where a given climate is crucial.

The technical advantage of using three-layer structures in construction is the weight of the barrier structures (on average 4-5 times), characterized by the possibility of lightening, expands the range of supporting structures and facilitates free planning within residential buildings, public and industrial buildings, increases earthquake resistance due to the reduction of inertial mass.

The use of three-layer construction will increase the quality of construction - improve the thermal insulation properties of buildings; increase the soundproofing properties of structures; serves to give a modern look to buildings and structures on the basis of the requirements for decorative and artistic quality.

For the wide application of three-layer barrier construction, the technology of processing and preparation of cold-waterproof layer composition in the middle layer is also necessary to expand the production of ultra-light filler. It is necessary to conduct a comprehensive study of the physical and mechanical properties of such concretes, the formation of cracks in the outer layer of structural concrete and three-layer structure under different forces, to develop a method for calculating hardness and strength.

However, the above considerations apply mainly to buildings being built in public partnership. Insufficient attention is paid to the issues of heat conservation and earthquake resistance in the personal, individual thinking of citizens. Solving the problem in a complex is a difficult task. Most heat-retaining materials have a porous structure, so their relative strengths are much lower than those of dense structures.

SUGGESTIONS

Based on the above, we recommend that the main load-bearing structures in the construction of local residential buildings be constructed of high-strength materials, ie steel, reinforced concrete, wood and composite materials, and the retaining walls and roof structures from multi-layered structures made of porous materials. In this way, while maintaining the cost of the building, we will ensure the compatibility of its performance, such as durability, spatial viability, earthquake resistance and heat retention.

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