

# *The formation of the cost of overhaul of apartment buildings in the budget of the region*

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**Abstract** — One of the main tasks in the formation of the regional program of overhaul is its cost estimate. In other words, it is necessary to know the amount of financial resources required for its implementation, both in the short and long term. The size of the marginal cost of work of common property overhaul in the apartment building, which is presented in the regional program, contains consolidated indicators of the overhaul of individual elements (types of work) of the apartment building. They are characterized by the presence of errors in their development and the general secrecy of information about the source data and methods for obtaining them. Currently, there is no base of enlarged estimated standards for overhaul, which are developed for objects-analogues. These standards will allow to quickly determine the preliminary cost of the common property overhaul of the apartment building at the stage of implementing tenders, in order to optimize the amount of necessary and sufficient investments.

**Keywords** — *overhaul, apartment building, estimated cost, consolidated indicator of the cost of overhaul, overhaul fund, regional program, energy saving technologies*

## I. INTRODUCTION

The important indicator of the socio-economic development of the region is the level of satisfaction of its population with housing conditions [1]. Satisfaction depends on a variety of factors, beginning from the availability of the dwelling itself, to the receipt of quality services for its maintenance and restoration. Russia's aspiration for European standards of life quality requires a revision of approaches to the formation of regional housing policy, primarily to the housing management system, focused on its preservation and reproduction. Multi-residential housing stock of the Russian Federation has a high degree of restoration, low energy efficiency indicators which do not match the technical standards, it leads to the overestimation of energy consumption. In such conditions, it is important to improve the

formation and implementation of regional programs for the housing stock overhaul and determining its estimate [6].

Currently, in accordance with Federal Law No. 271-FZ, in the subjects of the Russian Federation there is the implementation of regional programs of the overhaul of apartment buildings. These programs are intended for planning and organizing the overhaul of common property in the apartment buildings at the expense of the owners of residential premises, planning for the provision of state and municipal support for overhaul at the expense of the budgets of the Russian Federation and local budgets.

The regional program (long-term plan) for the overhaul in the Volgograd region was approved by the Decree of the Government of the Volgograd region of December 31, 2013 No. 812-p "On approval of the regional program "Overhaul of common property in apartment buildings located in the territory of the Volgograd region" (with changes of February 26, 2018).

In addition, when planning overhaul, it is necessary to carry out repair work taking into account the use of energy-saving technologies, which was confirmed by the Order of the Ministry of Construction of the Russian Federation of September 19, 2016 No. 953 where the methodical recommendations of the project implementation are given which are aimed at improving the quality and energy efficiency of apartment buildings during the overhaul of common property.

Thus, the purpose of the study is to improve the mechanism for forming the cost of overhaul of apartment buildings within the regional program [5].

To achieve this purpose it is necessary:

- to evaluate existing approaches to determining the cost of overhaul for planning in the budget of the region;

- to identify problems in determining the cost of overhaul of apartment buildings and their possible consequences;

- to propose a mechanism for forming the cost of overhaul of the apartment building at the planning stage of overhaul [13].

## II. PROBLEMS OF DETERMINING THE COST OF APARTMENT BUILDINGS

The problem of the need for overhaul of the apartment buildings throughout the Russian Federation is quite important. Untimely overhaul of the apartment buildings leads to their accelerated depreciation and an increase in the number of dilapidated and emergency housing, and therefore, poses an even greater problem for the state - the need to relocate residents [12].

As part of the regional program for the common property overhaul of apartment buildings in the Volgograd Region, in 2019 it is planned to renovate 323 residential buildings with a total area of 658.31 thousand square meters. It will improve the living conditions of 31.5 thousand people.

According to the information of the regional committee of housing and communal services and the fuel and energy complex, it is planned to replace 248 elevators in 64 apartment buildings, of which 230 are in Volgograd, 13 are in Volzhsky, and 5 are in Kamyshin. Currently, as a result of auctions, the contractors have already been identified to implement overhaul in 171 apartment buildings.

Owners of apartments and non-residential premises located in the apartment buildings are legally obligated to finance the overhaul of common property. Owners do not have the right to refuse payment of contributions - this is not the right, but the obligation of the owner.

The size of the marginal cost of each type of overhaul, which can be paid by the regional operator at the expense of the overhaul fund, formed on the basis of the minimum contribution for overhaul, taking into account state support and municipal support, is set by the authorities for three years and it is changed with annual indexation considering the inflation.

Despite the theoretical coherence in the system of overhaul, in practice there are some problems, the main of which are:

1. The determination of the cost of overhaul in the formation of the regional program is made on the basis of generalized indicators of the marginal cost of work, it leads to incorrectness of these calculations.

2. The unreliable cost of overhaul, approved at the conclusion of the contract, leads to bad quality repair works of contractors due to non-compliance with technologies and the use of bad quality materials. The nonobservance of the terms of the overhaul of apartment buildings is possible for various reasons [8].

3. The overhaul of apartment buildings often does not take into account the implementation of energy-saving technologies, which further leads to the overestimation of resource consumption.

Sources of financing for planning and organizing overhaul are contributions from owners of residential premises, the provision of state and municipal support for overhaul at the expense of the budgets of the subjects of the Russian Federation and local budgets.

## III. THE METHODOLOGICAL STATEMENTS AND MECHANISM OF PLANNING OF THE OVERHAUL COST WHEN FORMING THE REGIONAL PROGRAM

One of the main tasks in the formation of the regional program of overhaul is its cost estimate. In other words, it is necessary to know the amount of financial resources required for its implementation, both in the short and long term [2]. Elemental estimated standards of repair and construction works are used mainly in determining the current overhaul costs of a particular residential building [11]. However, today there is no base of enlarged estimated standards allowing to quickly determine the preliminary overhaul cost of the common property of the apartment building or the cost of implementation of medium-term and long-term programs for overhaul.

The size of the marginal cost of overhaul work of common property in the apartment building, which is presented in the regional program, contains consolidated indicators of the overhaul of individual elements (types of work) of the apartment building [15]. They are characterized by the presence of errors in their development and the general secrecy of information about the source data and methods for obtaining them. These standards, as a rule, are commercial in nature and represent an impressive set of indicators for consolidated types of repair work (services) with different nomenclature and the order of their application, which makes it difficult to use them at the planning of investments for overhaul of the housing stock.

Excessive detailing at the planning stage of the overhaul, taking into account the significant amounts of apartment buildings and their different actual states, will only lead to an inexpedient increase in labor, time and financial resources, as well as additional confusion in the calculations. Naturally, for each particular residential building in the future it is necessary to develop a full-fledged project for the production of repair work and all the required design and estimate documentation.

It is also necessary to conduct a comprehensive monitoring of the technical condition and energy parameters of the housing stock [16]. Monitoring data can be used for constant actualization of the regional overhaul program, which will significantly improve the quality of management of the development of objects at all stages of the life cycle.

In our opinion, at the regional level, it is the need to develop a system of consolidated indicators of the cost of overhaul of apartment buildings — individual structural elements and types of work which are intended for rapid assessment of the cost of overhaul of individual structural

elements and common property systems of the apartment buildings and prior cost determination.

The consolidated indicators of overhaul cost can be used for:

- the formation (planning) and implementation of socio-economic programs [3];
- the economic analysis at the preliminary stages of development of design solutions for the overhaul of the common property of apartment buildings;
- the analysis of the budget and economic efficiency of investments;
- determining the cost of overhaul of the common property of apartment buildings in the early stages of the investment process and evaluating their effectiveness in selecting a design solution, taking into account further operation.

The volume, composition and types of work taken into account in the development of the consolidated indicators of the cost of overhaul of apartment buildings, are accepted according to local estimates for objects - representatives and contain the following types of work:

- the repair or replacement of in-house engineering systems of electricity, heat, gas, water supply, sanitation – per 1 meter of network
- the repair or replacement of elevator equipment – per 1 elevator;
- the repair of roofs – per 1 square meter of the repaired roof;
- the repair of basements related to common property in apartment buildings - per 1 square meter of the repaired total area of the basement;
- the insulation and repair of facades - per 1 square meter of the repaired surface of the facade;
- the installation of collective (common) metering devices of resource consumption and control units (thermal energy, hot and cold water, electric energy) – per 1 square meter of the total area of apartment building and per 1 meter of pile.

The example of consolidated indicators of the cost of overhaul of apartment buildings for the repair or replacement of domestic cold water supply systems is given in Table 1.

The scope of work of the main works, accounted by consolidated indicators of the cost of overhaul of apartment buildings:

1. The replacement of water supply pipelines from steel water and gas pipes to polypropylene pipes PN 10 with hydraulic testing of pipelines.
2. The installation of socket fittings.
3. The installation of pressure gauges with a three-way tap.
4. The insertion into existing internal networks.

5. Dismantling of thermal insulation from mineral wool and insulation of pipelines with insulating pipes made of polyethylene foam type THERMAFLEX FRZ.

6. Loading and transportation of scrap metal onboard cars for 15 km (disassembled pipeline).

TABLE I. CONSOLIDATED INDICATORS OF THE COST OF OVERHAUL OF APARTMENT BUILDINGS — INDIVIDUAL STRUCTURAL ELEMENTS AND TYPES OF WORK

Code	The name of consolidated indicators of the cost of overhaul of apartment buildings — individual structural elements and types of work	The unit of measurement	The cost of consolidated indicators, rubles		Representative object (RO)
			At the current price level	Including the estimated value of returnable amounts	
1	2	3	4	5	6
1	Repair or replacement of in-house engineering networks of water supply, sewage, heat, electricity, gas supply:				
1.1	Repair or replacement of in-house cold water supply systems				
1.1.1	Replacing the cold water supply system from steel water and gas pipes to polypropylene pipes with a change in thermal insulation along the entire length of the pipeline, including:	m	1871.97	26.46	RO – 12
1.1.1-A	Replacement of pipelines, equipment	m	1464.82	26.46	RO – 12
1.1.1-B	Replacement of pipe insulation (heat-insulating pipes made of polyethylene foam type THERMAFLEX FRZ)	1 m of insulated pipeline	407.16	-	RO – 12

The Cost of Overhaul of the i-th structural element ( $Co_i$ ) or the common property system of a specific type of the apartment building is calculated using the following formula:

$$Co_i = (CICO_i \times C) \times E_c + A_c + VAT \quad (1)$$

where  $CICO_i$  — the Consolidated Indicator of the Cost of Overhaul i-th structural element or the common property system of a specific type;

$C$  – the Capacity of the planned overhaul works (total area, length, 1 elevator);

$E_c$  – the Efficiency Coefficient of energy-saving solutions;

$A_c$  – Additional Costs considered on separate calculation in the order provided by the Technique of determination of cost of construction production in the territory of the Russian Federation 81-35.2004

$VAT$  – value added tax.

#### IV. CONCLUSION

In our opinion, the main users of the database of consolidated indicators of the cost of overhaul of apartment buildings — individual structural elements and types of work can be the highest executive authorities of the subjects of the Russian Federation, as well as regional operators, management companies, the homeowners and other companies.

Its application will allow the subjects of the Russian Federation:

–to predict more reasonable the required amount of financial resources for the implementation of medium-term and long-term regional overhaul programs for apartment buildings, without reference to the state of each particular residential building, but only to the type of building and type of repair;

–to form a resource structure if it is necessary and determine the amount of funds collected by the owners of residential premises, as well as to plan the amount of state (municipal) support for certain categories of citizens and objects;

– to ensure more efficient management of resources in the process of implementing programs (the validity and stability of financial plans for overhaul, balancing financial plans for overhaul with production capacities of project and contract companies, control of the implementation of financial plans for overhaul, etc.);

- to perform comprehensive overhaul with the use of energy-saving technologies (including insulation of enclosing structures), which will not only ensure the required microclimate of the premises, but also increase the effective exploitation of the property as a whole, and in the future reduce operating costs [14]. When planning the overhaul, it is necessary to calculate the economic feasibility of performing repair work, taking into account the efficiency coefficient of using energy-saving solutions. Otherwise, energy-efficient measures will become energy intensive.

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