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## Program-target approach as a basis for issuing a backlog in construction

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Abstract. During the last decades, the problem of maintaining the level of the housing stock was solved by the residual principle. The low quality of housing due to the use of short-lived materials and projects not reflecting the real objects' state has led to accelerated rates of physical and moral deterioration of buildings. Implementation of the overhaul program is one of the priorities, but despite its significance, a number of problems of its implementation have been identified. The planning methods currently used do not properly reflect the changes taking place. The article proposes one of the possible solutions to the difficulties arisen, namely, the formation of a backlog on the program-target approach basis. Construction companies must diversify their backlog taking into account the existing workload and the lot structure determined by the customer.

#### Introduction

Despite the increase in overhaul of the housing stock of the Russian cities over the past three years by attracting federal funds for this purpose, the funds from a regional operator or funds from the property owners, capital repairs were made in only one quarter of apartment buildings requiring it. Consequently, the need for renovation and qualitative improvement of the housing stock, which can be achieved not only through new construction, but also major repairs and modernization, is quite high and obvious.

The system of organizing the overhaul of common property in apartment buildings is a legal and financial tool that allows for the elimination of physical deterioration of residential buildings, restoration and improvement of its performance characteristics.

The regional program for the overhaul of common property in apartment buildings on the territory of the Rostov region for 2015–2049 implemented in the Rostov region showed significant results, but revealed a number of problems:

1. The unsatisfactory quality of work and harm to the personal property of apartment owners.

Often, poor quality of work is due to the fact that a large amount of work is assigned to the contracting organization. Since it is impossible to fulfill the obligations assumed on time, the organization has to resort to the services of subcontractors, which leads to a decrease in a number of repairs and, consequently, savings on construction materials and the qualifications of the workers themselves.

2. Failure to meet the deadlines for the work. The main reasons are:

- lack of material resources, the need for which arises in the operation process. This entails stopping work, which is the law violation;

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- incomplete admission of the contractor's workers to the premises involved in the overhaul.

- a large amount of work is assigned to the contracting organization, which cannot be mastered on its own within the prescribed period.

3. The lack of the relevant and reliable data on the actual state of the housing stock, including information about the age, technical condition, level of the buildings' improvement subjected to major repairs, etc.

4. Lack of qualified specialists.

5. Insufficient quality of project design estimates.

At present the main criterion in construction for the efficiency of an enterprise's activity is the formation of a backlog that ensures the highest possible production efficiency. The main parameter of order work at a construction enterprise is the presence of customers whose requirements vary considerably in terms of the work performed volume, types of objects, types of structural elements and work production conditions, which requires enterprises to choose the correct method of organizing the repair and construction work and planning material and technical support.

The construction organizations have to solve the problem of combining flexibility in working with the customer and, at the same time, to ensure the achievement of maximum operational efficiency. This task requires the search for the effective methods of order management.

The parameters of the backlog are defined as a set of activities of customers whose requirements vary significantly in terms of the volume of work performed, types of objects, types of structural elements and conditions of work, as well as the capacity of the contract market.

The backlog is filled with orders - the main characteristic that determines the attainability of goals set by a construction organization.



Figure 1. The backlog formation

Set of orders in the backlog forms the production program, the planned parameters and the planned capacity of the construction organization. The procedure for creating a backlog is shown in Figure 1. The results of the planning of the production program show how close the organization is to its goals, the need for additional measures or changes to previously set targets and strategies. This is the first parameter regulating the intentions of the organization.

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The second parameter is associated with the production program implementation and the actual results' receipt. Contracts form a backlog and regulate the relationship, rights and obligations of the customer.

The contractor has the potential to select suitable objects for inclusion in the order book. However, despite the objective possibility of selecting such objects, the actual choice is predetermined by the customer during the formation of the lot. The customer, as a rule, includes the objects defined by the borders of one municipal entity or adjacent areas in the lot. At the same time, minimum attention is paid to the structure of the types of work, the technical condition of the capital repair facilities and, consequently, the number of objects.

The problem of building a backlog affects both parts: the customer and the contractor. A contract for construction and installation works can be concluded only on the basis of bidding results, with organizations that have been pre-selected and included in the register of qualified contracting organizations.

The main document regulating the selection of contractors for overhaul of apartment buildings is the Decree of the Russian Federation Government of 01.07.2016 No. 615 "On the procedure for attracting the contractors for providing services and (or) performing overhaul of common property in an apartment building and the procedure for the procurement of goods, works, services in order to perform the functions of a specialized non-profit organization carrying out activities aimed at both the overhaul of the overhaul of common property in apartment buildings".

This document provides a 2-step procedure:

1. inclusion of the contractor in the qualified contractors register list. The basic requirements for a potential pre-selection participant are established by the aforementioned decree.

2. conducting an electronic auction on the price reduction basis.

In this regard, the subject of an electronic auction for the right to provide services and (or) the overhaul of the common property of apartment buildings - the auction lot is considered as a backlog of orders. Requirements and obligations are set out in the auction documentation and the terms of reference, which is an integral part of the contract for the provision of services and (or) the performance of work.

When selecting the objects for inclusion in the contracting firm, the concept of an optimal backlog is used, which is understood as the aggregate of such objects from the total number of the proposed organizations achieving the maximum profit for a given degree of risk associated with the work or the lowest level of risk for given profit margins.

When issuing a backlog, the construction organization is faced with the task of not just selecting a number of new objects, but also taking into account the unfinished transitioning ones. In other words, the firm should strive to form some favorable combination of new and moving objects.

Under the conditions of the objects' maximum independence from each other, an important tool for reducing risk when forming a backlog is diversification, due to which there is the possibility of choosing, for example, several small objects instead of one large, which is usually beneficial for relatively small construction companies.

Diversification is a way to spread risk among many different projects. Due to the fact that there is no rigid linear relationship between the projects (the correlation coefficient is close to 1 at the same time), losses in one project can be compensated by acquisitions in another. The risk from the sale of the backlog as a whole may turn out to be less than the average risk from the implementation of individual projects.

Thus, in accordance with the described approaches of the construction organization, it is recommended that the following actions be carried out before including the objects in the backlog:

1) to process information about the objects to be selected;

2) to analyze the moving objects;

3) to analyze the objects to be selected;

4) to form permissible options for the backlog of orders, seeking to find a favorable combination of new and moving objects;

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5) choose the most profitable option for the company with the installation of an acceptable level of risk.

As organization can go for an acceptable risk without complete profit loss. More dangerous is the critical risk, which is associated with the production activities costs loss, i.e. all estimated revenue is lost and the costs have to be recovered at their own expense. The most extreme case is a catastrophic risk that leads to the loss of all the company's property, its bankruptcy.

Factors characterizing the efficiency of work, are indicators of quality, price and term of work. However, these indicators should be directly interconnected with the material and technical potential of the enterprise.

The solutions in the design and manufacture of repair and construction works are multivariate. Specified requirements can be met in the design of technological processes and the required amount of the labor costs, the level of which is predetermined by the degree of material and technical support of the organization.

Therefore, it is proposed to use the mechanisms of program-target management as the main tool for optimizing the procedure for forming the backlog.

Program-targeted management is carried out through the implementation of targeted integrated programs. The regional program for the overhaul of the common property of apartment buildings is a directive and address document, which is a set of activities linked to the resources, performers and terms of implementation, aimed at:

- overhaul planning for each apartment building;
- organizing targeted financing from all sources, including state and municipal support, funds from owners;
- organization of infrastructure work a regional overhaul operator providing collection of target funds and organization of overhaul of apartment buildings.

The activities and tasks of the Regional Capital Repair Program are determined on the basis of the Government Decree of the Rostov Region dated December 26, 2013 N 803. But in practice, to be able to use the program-target approach, it is necessary to determine the following fundamental points:

1) the main parameters of the strategy for the future development of real estate, etc., created as a result of the program measures implementation;

2) the program potential indicators (level, dynamics, structure);

3) the available resources analysis results and the effectiveness of their use in the past;

4) alternative scenarios of movement towards the achievement of strategic goals and mechanisms adequate to them for adjusting the tactics of implementing program activities;

5) criteria for evaluating the program's effectiveness, its units and individual measures to

the various implementation stages, as well as the conditions and procedures for adjusting them in accordance with changing time priorities;

6) methodological recommendations and procedures for determining the priority of solving regional tasks and their coordination on institutional and informational support, resources and deadlines;

7) mechanisms for the distribution and redistribution of funds at various levels between the target programs, procedures for their coordination on resources and deadlines, possible and priority mechanisms for attracting additional funds for the targeted solution of urban development problems;

8) possible risks and procedures for concentrating urban resources for the execution of the program, and, which is very important in modern conditions, the forms of their insurance;

9) forms and methods of public control.

#### Summary

As a result of solving the problems that arise, the use of the program-target approach is to allow to form a system that will be a symbiosis of the medium-term and continuous design with different implementation terms, regulated by infrastructure and resource provision with special mechanisms

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oriented to headquarters and dispatch functions, provided with feedback, perceiving and reacting to external changes.

Realization of this goal will require the fulfillment of all the above-mentioned requirements, concentrating resources on the integrated fulfillment of contractual obligations in a dynamic format.

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