Methodology for construction compliance monitoring in the crediting of investment projects for road construction

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Abstract. The article provides the results of development of the methodology for construction compliance monitoring in the crediting of investment projects for road construction. Work scope analysis of construction audit was conducted and an algorithm of financial audit in the crediting investment projects was developed. Furthermore, the possible pitfalls and abuses of counterparties were investigated and recommendations were given allowing the bank to receive objective and independent information on the progress of the project in real time. This mechanism is useful for the bank in insurance of possible risks, targeted and rational use of credit funds.

1. Introduction

Today funding and crediting of road construction reflect all stages of the investment process, being a key factor in constant circulation of the working assets of these enterprises. The development of crediting relations in the field of road construction is carried out through both long-term and short-term loans to customers for capital investments. Construction loans are usually provided for a fairly long period and consider a complex supply structure, as well as the availability of highly skilled specialists in the field of construction, marketing and valuation of transport infrastructure facilities in the state of the bank [1].

Ensuring the efficiency and reliability of credit operations requires the bank to continuously monitor all stages of the credit process implementation. The monitoring of the loan starts immediately after the loan is given to the client. The main objective of the bank in progress monitoring of credit operations is to establish an effective structuring of the credit process and to search for perfect crediting mechanisms [2]. Banking control and management of the credit process is an indispensable prerequisite for the optimization of the organization of lending in commercial banks. In the process of control over credit operations, the bank should pay special attention to certain problems: compliance with the principles of lending; Identifying problem loans and developing measures to eliminate debt; Analysis of the quality and structure of the bank's loan portfolio as a whole; Credit risk control; Monitoring of the credit market and development of measures to increase the involvement of the bank in it, etc. The requirement regarding the timely and complete repayment of a loan is inseparable from the issue of constant monitoring of the size and quality of the received supply. The Bank monitors the intended use of the loan, as the loan is provided only for the specific purpose financing of a particular economic project or commercial operation. One of the efficient methods of bank control in construction crediting is construction monitoring and financial audit, which allows the bank to reduce possible risks [3].
2. Materials and Methods
Construction audit is a reliable means of financial control over the efficiency of investment and protection of the interests of the customer (investor) of the project. During the audit, the parameters of pricing and the formation of the value of the object are analyzed at each stage of installation, construction, finishing and repair work. The technical aspect includes checking the quality and volume of the work performed, examining the project documentation and monitoring compliance with the current legislation, while the financial aspect allows to compare the completed construction and installation work with the design and budget documentation (Figure 1).

Carrying out complex measures of financial and technical analysis in construction will help to avoid possible troubles and abuses on the part of an unscrupulous contractor (Fig 2). Financial losses of the investor are a serious risk for the successful implementation of the investment project, especially if the loan funds of the bank are involved in this project. Such kind of losses can adversely affect the fulfillment of the terms of the loan agreement. However, financial and technical provided to the bank information on the construction of the facility is not always reflected in the reports on the progress of the investment project objectively and reliably [4]. This prevents the bank from promptly reaction during the lending of the investment project. Moreover, at a certain stage it may turn out that the investment project requires additional financing because of an incorrectly set budget or it is threatened with a stop because of administrative sanctions due to a not received in time construction permit or any reconciliation.

The increase in the project budget or the postponement of construction completion dates are serious risk factors for the bank that lends to investment projects. Such factors lead to problems in the implementation of the loan agreement, require additional unplanned costs, and as a result, the expectations of the parties from the joint project are not fully met [5].

Therefore, during the preparation of the loan agreement and directly during the construction of the facility, the Bank needs comprehensive information on the investment project. It is best if such kind of information is provided to the Bank by an independent expert organization. Professional support and monitoring of construction investment projects can only be carried out by specialized expert organizations that have experienced specialists in their staff [6].

**Figure 1.** Work scope of construction audit
3. Results

On the basis of the foregoing, we propose an algorithm for the implementation of financial audit in lending to investment and construction projects (Figure 3).

Thus, construction audit is an indispensable prerequisite for lending to construction project in any case.
Information necessary to carry out the construction monitoring (audit):
1. full package of licensing, title and project documentation
2. approved construction estimates
3. executive technical materials (work logs, certificates for concealed works and tests of engineering networks and communications, geodesic schemes)
4. accounting documents, confirming the cost and volumes of performed works and materials: information on the costs and works, acceptance certificate for the work performed, work logs
5. Contract for work and labor, supply of equipment and materials

The Bank shall not provide any funds to the client until construction permit is received, a document confirming the compliance of the project documentation. It is not out of doubt to make sure that the developer possesses the qualified labor force necessary to carry out the work in accordance with the plan, or individual works will be performed under the contract by other firms [7]. The key component of the construction audit is financial supervision of the project implementation. The objective of the financial audit is to determine the adequacy of funds for construction, as well as to estimate the project's effectiveness. When conducting a financial audit during the implementation of the project, it is necessary to monitor the compliance of costs with similar costs for other developers.

4. Discussion
Banks need a professional assessment of the real situation with the targeted use of the funds allocated by them and the prospects for repayment of the loan after issuing a loan for a construction project. In addition to the initial audit of the project, the construction audit is carried out in the form of financial and technical monitoring, which allows the bank in real time to receive objective and independent information on the progress of the project, the emerging risks, targeted and rational use of credit.

In this case, submitted to the bank reports consist of:
1. Technical supervision
   - monitoring of the implementation of the construction schedule for the period of design, construction and installation, commissioning, supply of equipment and materials;
   - checking the availability and completeness of design estimates;
   - monitoring the availability and updating of permits / licenses, etc.;
   - quality control of construction materials;
   - safety assessment at the construction site;
   - quality control of the installation of the supplied equipment;
2. Financial Supervision
   - monitoring of intended expenditure of borrowed funds;
   - control over document circulation for the presence and completeness of business contracts, acceptance certificates for work and other necessary documentation;
   - control over compliance of volumes and cost of the executed works with the contractual conditions;
   - assessment of compliance of the approved estimate with actual costs;
   - identification of financial and planning factors that may lead to a negative or positive deviation of the project from the planned indicators.

5. Conclusions
In this article we proposed an algorithm for implementing construction compliance monitoring in the crediting of investment and construction projects, which takes into account the structure of projects in order to reduce credit risks.

The methodology for construction control for purposes of bank crediting of investment and construction projects is clarified, which is distinguished by the need for an in-depth financial audit and comparison of the results of construction control and financial audit; The procedure for carrying out a financial audit as a part of the construction monitoring over projects with the involvement of credit funds, which is distinguished by the complex nature of the evaluation, is specified.
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