Features of the capital construction pricing in Russia and abroad

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Abstract. The article analyzes the pricing process during the capital facilities’ construction in Russia and abroad. The main regulatory and methodological documents are highlighted. It has been established that the estimated norms and standards in the most developed countries of the world have a similar structure, but may differ in the degree of elaboration. It was noted that for the international cooperation development, the methodological base of the estimated calculations should be modernized today, while the cost of labor, technical and material resources should be determined depending on the place of their acquisition and in the currency of the supplier’s country.

1. Introduction
International cooperation in the large-scale construction projects’ implementation leads to the fact that Russian companies erect the capital construction projects outside the territory of the Russian Federation, which leads to certain conflicts in the field of pricing in determining the estimated cost of these facilities’ construction.

Currently the MDC 81-35.2004 “Methodology for determining the cost of construction products in the Russian Federation”, which defines the estimated cost of construction as “the funds necessary for the implementation of construction in accordance with the design materials”, and which are the basis for determining the amount of capital investment, construction financing, the formation of contract prices for construction products, etc. is in operation in the Russian Federation.

However, when implementing the construction projects outside the territory of the Russian Federation, as a rule, it is necessary to take into account both the requirements contained in the domestic regulatory framework and the design standards adopted in the territory of the country of construction.

The article presents the results of the Russian and foreign experience analysis in building pricing in order to formulate the proposals for updating the regulatory framework of the Russian Federation for the large-scale construction projects’ implementation and to strengthen the international cooperation.

2. Methodological principles of pricing in Russia
Currently, the Russian pricing system includes the state, industry, territorial and individual estimated norms and prices.

In general, the cost of construction is determined by the sum of the three components and is calculated according to the formula below:
\[ EC = DC + OC + EP \]  

where EC is the estimated cost,  
DC defines the direct costs,  
OC defines the overhead costs,  
EP denotes the estimated profit.

Direct costs include all the costs associated with installation and construction, i.e. the cost of material resources, including building materials, the costs of operating and maintaining a technical park, installation, relocation and dismantling of construction equipment, garbage, soil, and wages for workers.

Overhead costs are not associated with the construction work, as a rule, these are the “expenses of organizations carrying out the construction to cover the administrative and administrative expenses, expenses for servicing the construction workers, organization of work on construction sites and other costs related to the estimated cost of work performed”.

The concept of estimated profit characterizes the profit that the contractor will receive, and is taken into account when calculating the total construction cost.

In the Russian Federation, when constructing the capital construction projects in the field of pricing, it is customary to single out the several methods that will be discussed below, however, the most popular of them is the basic index method, which consists in determining the cost of construction using a system of current and forecast indices in relation to the cost, defined at the base level.

When using the resource method in pricing during the construction object construction, all the cost components are determined by the current prices of services and resources and are summarized. The final cost estimate includes the possible costs, formed taking into account the project documentation or current standards. The main disadvantage of this method is the difficulty in calculating and justifying the current prices used in the calculations.

The resource-index method uses a system of indices – the correction factors - and is built on the resource calculation. This method also makes it possible to simplify the pricing process in the face of inflation.

In the above-mentioned two methods, the amount of direct costs is determined taking into account the operating time of the equipment (machine hours), labor costs (man hours), and also the costs of the material resources.

- The systems of current and forecasted indices at the cost determined in the base price level (set at a specific date) are used in the base-index method of pricing in construction. Here, to calculate the total cost of the project, the base prices are multiplied by the correction factors.

- The basic-compensation method estimates the actual costs after the completion of the construction project and determines the total cost as the sum of the basic and additional values established during the work. This method involves two stages:

  - the first stage is the development of documentation (facility design), where the calculation is carried out at a basic price level, inflationary tariff increases are forecast in parallel.

  - the second stage is the direct construction of the facility, when the calculation of additional costs is carried out directly in the process of acquiring the materials and performing work, and the adjustments are also made regarding the prices calculated at the design stage.

  With the method of using the data bank, price calculation takes into account already designed or constructed construction projects. The corresponding items of expenditure are adjusted by the coefficient of appreciation.

Currently, the work to develop a new version of the methodology for determining the estimated construction cost in Russia is underway.

At the same time, the state regulation of pricing in construction in our country currently has only an indirect effect on the pricing process and defines only restrictions and conditions on the level of estimated costs, i.e. does not regulate the process of pricing directly.

The following regulatory and methodological documents that regulate the estimated cost determination in construction are used as a methodological base:
Orders of the Ministry of Construction and Housing and Communal Services of Russia, uniform industry guidelines for determining the estimated cost of construction and preparation of budget documentation, guidelines for determining the cost of construction products, etc. [1-11].

3. Methods and methodology. Principles of pricing abroad

There is no mandatory system of estimated standards in the USA and Canada, as well as the requirements for the harmonization of price pools, and their use is advisory. When implementing the construction projects, as a rule, it is customary to use the unified databases against the background of a complete computerization of the process of compiling and using budget estimates, i.e. in fact, there is an active introduction of information modeling technologies [12,13]. The unit rates’ sources are the rates for the previously concluded contracts, official national statistics, as well as the annual company directories. For example, the directory of the company Mintz (USA) examines in detail almost all types of construction work and presents 50-60 thousand-unit prices taking into account the cost of materials, labor, operation of machinery, overhead costs and profit of the direct contractor (profit and overhead costs of the general contractor accounted separately).

It is also worth noting that the system for determining the construction cost factors was created in these countries in the early 40s of the last century and is still in effect. The system is based on 15 annual collections of building quotes encoded using the national classification system. At the same time, the cost of materials and structures includes, among other things, the transportation costs. And despite the fact that these pools are not officially approved at the state level, they are generally recognized by the firms and organizations and contain about 3,000 prices for the buildings and structures’ elements.

However, some design organizations in the United States are developing their own methods of calculating the construction costs, taking into account the economic pool status. In this calculation, the overhead costs, as a rule, depend on the annual volume of work and cannot exceed 30% of the DC cost, and the profit is calculated taking into account the coefficient of the construction cost, taking into account the inflation rate, and made the workers and construction operators of cars dependent on the construction wages.

In the United Kingdom, it is customary to use the New Rules of Measurement (NRM) standard, prepared by the Royal Institution of Chartered Surveyors (RICS), when preparing the estimates. The design work cost varies to a large extent on the nature of the project and the conditions in which the designer is involved.

In addition to the producer price indices, the cost indices are also used in the country:
- Quarterly Building Price and Cost Indices;
- Price Adjustment Formulae for Construction Contracts.

Income tax does not exceed 35%, and the maximum profitability cannot be more than 3-6% [14].

In the countries of the European Union, the harmonized standards set “Eurocodes” are developed, which provide the common criteria, as well as the design methods.

In France, when calculating the construction cost, the economic pool “Le coût des travaux de bâtiment” (Cost of work in construction), which consists of two volumes, is used to determine the preliminary (approximate) and the operational estimates of the construction work cost. The economic pool contains the instructions for the production of the integrated work packages that characterize the basic construction processes.

In Germany, the German Information Center for Construction Costs annually publishes a collection of cost indicators in three parts, which is used to justify the construction costs. The first part of this collection is intended for budgeting and preliminary cost determination and includes the cost indicators for 74 types of the construction projects. To determine the cost of construction and installation works (construction and installation works) and the development of estimates, the second part of the collection is intended, and the third part of the collection is used to develop the estimates and assess the cost of the work performed.
In addition, in Germany, pricing is necessarily monitored by evaluating methods for determining the conformity of prices, verifying the volume of goods exchange, etc. At the same time, the German standards are improved taking into account the changes in tariffs and prices on a quarterly basis, complete revisions occur once a year. The budgeting procedure is determined by the Bill of Quantities standard [15].

Let us consider the features of pricing in the CIS countries.

In the Republic of Tajikistan, it is customary to use the resource method in determining the construction cost in contractual current prices. In this case, the data of the elemental estimate and the regulatory base of the YSC CMP-2007 are used.

The same method is used to determine the construction cost in Ukraine, while the calculation uses the normative and estimated indicators that take into account the consumption of labor, material and technical resources on the basis of state resource elemental estimated norms, and the current prices for labor, material and technical resources. Direct costs are calculated taking into account these norms and the current prices for labor, material and technical resources are determined, other costs are determined by calculation.

In Kazakhstan, the state standard for determining the estimated construction cost is drawn up on the basis of the resource method for determining the construction cost at the current prices, contains the basic principles and methodological provisions for pricing in construction and budgeting, and is the normative basis for determining the construction cost.

In addition, a number of regulatory documents on pricing and estimates are in force on the state territory, as well as the methodological documents on pricing in construction [16-20, etc.].

In the Republic of Belarus, normative and methodological work in the field of pricing in construction is carried out by the Republican Scientific and Technical Center for Pricing. In this case, the price is formed on the basis of averaged standards developed on the basis of the averaged working methods and conditions and grouped in special collections. When calculating the construction cost, the estimated resource standards are applied.

The current system of pricing and estimated regulation in the construction of the Republic of Kyrgyzstan includes the state estimated standards and other estimated regulatory documents. Kyrgyz Republican unit prices are being developed in the country, designed to determine the composition and need for the material, technical and labor resources necessary for construction, installation, repair, construction and commissioning. KRUP are used to determine the estimated cost of the work performed by the base-index method, to develop the unit prices for the estimated standards.

In Uzbekistan, the current estimated pricing model is very outdated, as the estimated economic pools were developed as far back as 50-60s of the last century and do not take into account the real costs of most types of work, as well as the actual labor costs, the capacity of specialists, as well as the costs of operating machines and mechanisms.

Thus, currently in this country, the costs are determined by the centrally set percentages of the object’s value.

In the Republic of Armenia, similarly, the standards in the framework of the respective programs of the CIS countries were developed, as well as the old Soviet building norms and rules, are taken as the basis of the regulatory framework for design.

4. Results
As a result of the study, it was found that today much attention is paid to the issues of modernization of various norms and rules in the field of pricing in construction, as well as to the possibilities of clarifying the costs in the construction of various kinds of objects, taking into account the new construction technologies’ introduction [21-34, etc.]. Moreover, the estimated norms and standards in the most developed countries of the world are built on approximately the same principle, but differ in the degree of detail.

The peculiarity in the field of pricing in the EU countries is the lack of construction and construction work, and the term “construction products” includes only the construction work, where
the cost of installing technological equipment almost always takes into account the cost of delivery and commissioning of equipment.

In the USA and Canada, there is a detailed elemental estimated regulatory base and an enlarged estimated base, which is used for the estimated calculations in the absence of the detailed documentation. The detail degree of the aggregated estimated standards changes in parallel with the change in the elaboration of the project. More precise standards and calculations based on real facilities analogues are used at the stage of project development and tender documentation.

In most CIS countries and EurAsEC, the Soviet estimate and the regulatory base is still used, followed by the construction cost indexation, taking into account the changes in prices for building materials and structures. In this case, both basic-index and resource methods are used to assess the construction cost, but the latter is most preferred (Ukraine, Tajikistan, Uzbekistan, Kazakhstan). At the same time, the systems for monitoring the market prices for the main types of resources for their suppliers and (or) contractors are being created in parallel. At the stage of preliminary calculations, the index methods for assessing the cost of construction are used, but the contractual (contractual) relations between the participants in the investment process are nevertheless built on the basis of the resource estimates, which allow the investors (customers) to conduct a thorough cost analysis for the development and implementation of the investment construction projects. The construction cost in the CIS countries largely depends on the cost of material resources.

The Republic of Belarus has a system of weighted average prices for the material resources. A detailed elemental estimate and regulatory framework is supplemented by the real price monitoring, which is used to index the construction cost and determine the costs of machines and mechanisms.

5. Summary
Abroad, corporate norms and prices are under constant pressure from the competitors, in connection with which the contractors have to find the options to reduce unit costs, though, among other things, improving the norms and standards. This is also confirmed by the fact that in the bid prices at tenders by contractors, a small percentage of profitability - 2-6% of the production costs - is taken into account.

In addition, for the international cooperation development it is necessary today improve the methodological base of estimates, while the cost of labor, technical, material resources should be determined depending on the place of their acquisition and in the currency of the supplier country. Thus, taking into account the construction organization’s conditions, the estimated calculations can be made in mixed prices and in the currency of the construction country.

For technical assistance, it is necessary to draw up a consolidated estimate calculation of the construction cost, an object estimate calculation; local estimate calculation; estimates for the design and survey work.

The estimate documentation should be accompanied by a separation sheet of the work volume; summary resource sheet, as well as all the necessary supporting documents.

In addition, the costs associated with obtaining an architectural and planning assignment, carrying out geodetic and other types of work performed prior to the start of construction, with obtaining initial data and technical conditions necessary for architectural and construction design and other types of costs that have a significant impact on the formation of total value should not be underestimated.

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