Key indicators of quality control assurance in the quarterly development of residential buildings

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Abstract. Ensuring the quality of construction of capital construction projects is one of the most important functions of the customer, contractor and other participants in the construction, which should be carried out at all stages of construction of residential buildings. Inadequate performance of their functions by construction participants can lead to a low quality of construction and installation work, a violation of the technology and organization of construction, and as a result, to a delay in construction.

According to part 1 and part 2 of article 53 of the Urban Planning Code of the Russian Federation of December 29, 2004 No. 190-FZ Construction control is carried out during the construction of capital construction facilities, in order to verify the compliance of the work performed with the design documentation (including solutions and measures aimed at ensuring compliance with the energy efficiency requirements and the requirements for equipping the capital construction facility with metering devices for the energy resources used), the requirements of technical regulations, the results of engineering surveys, the requirements for construction, reconstruction of a capital construction facility established on the date of issue of a land plot submitted for obtaining a construction permit for a town planning plan, as well as the permitted use of a land plot and restrictions established in accordance with land and other legislation of the Russian Federation. Construction control is carried out by the person carrying out the construction. In the case of construction, reconstruction, overhaul on the basis of a construction contract, construction control is also carried out by the developer, technical customer, the person responsible for the operation of the building, structure, or the regional operator or by an individual entrepreneur or legal entity engaged by them on the basis of the contract. The developer or technical customer, on his own initiative, may involve the person preparing the design documentation to check the compliance of the work performed with the design documentation [1].

Currently, in the city of Irkutsk and the Irkutsk region, the quarterly development of capital construction objects is being carried out, such as [4,5,6]:

1. A group of residential buildings in the 6th microdistrict Novo-Lenino, developer MUP "UKS of Irkutsk"
2. Residential complex "SYNERGY" in the 3rd microdistrict. Shelekhova, developer of the IrkAZ Youth Organization Development Fund
3. Complex low-rise buildings, located at the address: Irkutsk district, in the area of settlements Pivovarikha, Novolisikha, Burdakovka, developer OOO FGC DomStroy
4. A complex of apartment buildings in the microdistrict. Ugolshchikov, Tulun, developer of GKU Irkutsk Region "Customer Service of the Irkutsk Region"
5. Residential complex in md. "Central" town of Taishet, developer Rusal Taishet Aluminum Plant LLC and many other residential complexes.

As stated above, during the construction of any capital construction facility, the person carrying out the construction and the developer must monitor the performance of work that affects the safety of the capital construction facility. And also control over the implementation of construction work should be carried out, which cannot be carried out after the completion of other work, based on the construction technology. Based on the results of monitoring the execution of the specified work, the safety of the specified structures, sections of the engineering and technical support networks, as-built documentation is drawn up [7,8,9].

According to the information data of the State Construction Supervision Service of the Irkutsk Region (hereinafter referred to as the Service), presented in Table 1, it can be seen that in 2019, when the Service carried out inspections at 409 capital construction facilities, 1704 violations were revealed. Of these, 83 administrative cases were initiated in accordance with the Code of Administrative Offenses of the Russian Federation.

Table 1. Main indicators of the implementation of activities for state construction supervision.

| Indicator name | for 2019 |
|----------------|----------|
| Number of checks performed | 958 |
| Capital construction objects checked | 409 |
| Violations identified | 1704 |
| Issued prescriptions | 414 |
| Based on the results of inspections, cases of an administrative offense were initiated of them: | 83 |
| construction and operation of capital construction facilities without a permit (Article 9.5 of the Administrative Code of the Russian Federation) | 10 |
| violation of the requirements of project documentation, technical regulations, mandatory requirements of standards, building codes and regulations (Article 9.4 of the Administrative Code of the Russian Federation) | 39 |
| failure to comply in time with a legal order of an official (article 19.5 part 6 of the Code of Administrative Offenses of the Russian Federation) | 34 |

According to Part 2 of Article 54 of the Town Planning Code of the Russian Federation of December 29, 2004 No. 190-FZ, the subject of state construction supervision in relation to capital construction projects is to check:

1) the compliance of the performance of work and the building materials used in the process of construction, reconstruction of a capital construction facility, as well as the results of such work, with the requirements of the approved project documentation and (or) information model (if the formation and maintenance of an information model is mandatory in accordance with the requirements of this Of the Code), including the requirements for energy efficiency (except for capital construction projects, which are not subject to energy efficiency requirements) and the requirements for equipping a capital construction facility with metering devices for the energy resources used;

2) having a building permit. Thus, the main part of the violations identified by the Service, for example in 2019, is the inconsistency of the work performed with the design documentation of capital construction objects and, as a result, poor-quality performance of functions for construction control of the person carrying out the construction and the customer.

Due to inadequate construction control, the quality and safety of capital construction facilities decreases, and the terms of commissioning facilities are delayed.

Table 2. The number of issued opinions on the compliance of the constructed, reconstructed capital construction facility with the requirements of design documentation.
| Indicator name                                                                 | for 2018 | for 2019 |
|---|---|---|
| Conclusions were issued on the compliance of the constructed, reconstructed capital construction facility with the requirements of design documentation. of them: | 114 | 105 |
| residential objects | 37 | 48 |
| non-residential objects | 77 | 57 |
| Refused to issue an opinion | 3 | 2 |

So, according to the data indicated in Table 2, the number of conclusions issued by the Service on the compliance of the constructed, reconstructed capital construction facility with the requirements of the design documentation for 2019 decreased in relation to 2018 by 7.8%.

The main mistake of the customer, entailing a decrease in the quality of the work performed, is the transfer of their functions, for the implementation of construction control, to the person carrying out the construction of the facility.

On the basis of Article 749 of the Civil Code of the Russian Federation, it establishes the customer's right to involve a specialist in the control and supervision of the performance of work. If the customer does not have special knowledge or for other reasons does not want to fully perform the customer's function of control and supervision of construction, then he has the right to entrust the implementation of this function and the adoption of decisions on his behalf in relations with the contractor to a third party - a professional legal entity or an individual an entrepreneur who has a certificate of admission to work on the implementation of construction control, issued by a self-regulatory organization [3].

If the customer has transferred the construction control functions to the contractor, it turns out that the construction control and the direct construction of the capital construction facility are carried out by the same person.

According to the regulation on construction control during construction, reconstruction and overhaul of capital construction facilities, approved by the Government of the Russian Federation dated June 21, 2010 № 468, the customer must carry out control measures in relation to the contractor's work at each stage of the facility construction.

Thus, control activities carried out within the framework of construction control by the customer in relation to the contractor are carried out by the contractor himself. And accordingly, it leads to a weakening of quality control over the completed construction work, since only an independent and disinterested person in the delivery of work can reliably certify the fact of proper performance of work, structures and sections of engineering networks to be closed, their compliance with the established requirements [2].

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Based on the above, it can be concluded that high-quality planning, design and construction takes the most important place in ensuring integrated construction in the quarterly development of residential buildings. The effective implementation of these solutions is associated with the capabilities of existing organizational forms and construction methods. Sometimes the “poor quality” of construction is caused by the lack of consideration of organizational factors in the planning and design documentation, insufficient regulation of complex construction in the design of its organization. This negatively affects the construction of residential buildings in the neighborhoods, and then significantly worsens the social and living conditions of the population and, ultimately, reduces the efficiency of capital investments. In addition, the lack of the correct organization of the quarterly development of residential buildings does
not allow to exercise control over a large amount of resources and fully assess the planned and production activities [10,11,12,13,14,15].

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