



INNOVATIVE TECHNOLOGIES FOR BUILDING RECONSTRUCTION

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ABSTRACT

The article discusses the technology of using reconstruction of buildings and structures in managing their reproduction.

In the field of fixed asset management, reconstruction holds a special place. This is due to its necessity due to changes in the building's functional purpose, such as reconstruction, addition of floors, redevelopment, obsolescence, etc. One of the characteristics of reconstruction is the facility's position in the urban environment, which necessitates a careful approach to the existing development. Reconstruction is a multifaceted subject of study, and it involves not only external features but also a direct analysis of the soil, hydrogeological, and structural parameters of the facility as a whole, with the aim of avoiding serious errors. Reconstruction design itself occurs in parallel with investment processes, i.e., throughout the entire project lifecycle until its commissioning. The initial stage of any survey of a building and structures is the reconstruction brief, which includes information on the objectives, basic requirements, and operating conditions of the facility after completion of the project. Based on technical documentation, a thorough inspection of the facility, particularly its structures, is conducted. The outcome of this inspection will be the identification of critical building components and the decision-making on their reinforcement throughout the entire construction period. A comprehensive survey is conducted for all structures. Experts have determined that structures are inspected selectively only if the number of structures exceeds 20 units and more than 20% of them are in good technical condition [1]. Therefore, the volume of selective surveys should be at least three or at least 10% of the total number of one type of structure. This may include the following types of work: Foundation reinforcement and soil compaction. The foundation of any building or structure is its bearing capacity, which increases or decreases the bearing capacity of the foundation, and the structure is susceptible to collapse. Therefore, special attention is paid to its improvement during reconstruction. In practice, strengthening is achieved by increasing the foundation area, deepening it, transferring the load to the underlying soil, and strengthening the foundation masonry. Soil compaction can also be achieved using synthetic resins, cement, and thermal treatments. Due to the unique nature of each project, there is no single standard method for solving these problems; these methods are usually combined. Cracks, erosion, and settlement of the building's above-ground structure lead to a sharp reduction in its load-bearing capacity. To eliminate obvious defects, reinforced concrete "jackets" and collars are used, but these methods are currently unviable from both an economic and technical standpoint. Therefore,

increasing load-bearing capacity is achieved by dismantling the roof and ceiling, and replacing the mortar in the horizontal joints of brick walls with a similar mortar of a lower grade [1].

Strengthening brickwork and eliminating defects, dismantling the façade. A building's exterior is its calling card, its architectural identity, but harsh weather conditions and construction errors can often dramatically alter it. In this case, façade reconstruction is required (repairing brickwork defects, painting, plastering, and dismantling the ventilated façade). Often, especially recently, due to the negligent attitude of masons, the building's façade is reconstructed long before it has physically deteriorated, in order to restore its pleasing appearance. In this case, it is necessary to completely restore all damaged sections of the brick wall and fill the joints with color-matched mortar. When restoring plastered walls, it is necessary to remove all damp plaster and areas where various types of deposits have appeared, and apply a new coat of plaster. A quick and convenient way to eliminate uneven wall texture after plastering is to fill it with putty, followed by priming. Next comes the complete painting (walls, window and door openings, trim, and moldings). If the scope of work is large enough and the building's façade itself does not have a complex architectural form, then painting is done mechanically, primarily with electric paint sprayers (at a temperature of at least +5° C) [2]. A significant problem in reconstruction is the weathering of brickwork joints, as well as the repair of cracks in lintels. In these cases, a method is used by injecting liquid cement mortar into these openings, which helps restore the efficiency of the structures [2]. The roof is the element of the building that is constantly exposed to aggressive factors, be they physical, chemical, or mechanical. The nature of the roof reconstruction is directly related to the materials from which it is composed. If the roof is rigid, then most likely it is affected by rust and should be painted; if the roof is made of soft materials, then it is patched or completely dismantled depending on the degree of wear. Replacement of gutters or pipes is performed either completely or partially. Building extensions can be constructed with or without structural reinforcement. This is one of the most convenient and reliable ways to gain additional square footage in built-up areas of the city. Experiments have proven that adding 2-3 floors to a building without reinforcing the foundation is possible, but this would increase the load-bearing capacity of the first-floor piers, even if the building does not exceed 5 floors. Building extensions with independent frames allow for building heights of up to 15 floors. The installation of attics also allows for a quick and effective increase in the area of a building without interrupting its operation [2]. Social research suggests that this method may allow for an increase in living space. Increased construction in various cities is leading to changes in transport infrastructure. From a technical perspective, buildings and structures are considered new construction projects; with one exception, a number of additional works will be required to eliminate settlement deformations. After all construction and installation work has been completed and before the facility is commissioned, the final stage of reconstruction begins: eliminating defects, as well as commissioning. Reconstruction of buildings and structures must be carried out with particular responsibility, as the result of all work will be a facility that is not only aesthetically pleasing but also meets safety requirements.

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