

Foundations and foundations of reconstructed buildings in a confined space

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The features of the device foundations of buildings that are being reconstructed are noted.

Keywords: *foundation, foundation, reconstruction.*

When performing construction work related to the reconstruction and repair of buildings, the greatest difficulties are caused by the work on strengthening the foundations and strengthening the foundations, which must be carried out from the basement or first floors of the houses. All this requires the development of special technologies and design solutions, non-standard methods of organizing work and the corresponding technological equipment.

Experience in the construction and operation of buildings and structures in various engineering and geological conditions allows us to highlight a number of factors that must be taken into account when drawing up engineering surveys and performing reconstruction and repair work. These include: a change in the physical and mechanical characteristics of soils during the operation of buildings; foundation damage; the development of uneven base sediments, which cause significant deformation in the structures of buildings; changing the layout of the building and increasing loads.

Long-term operation of buildings and structures can lead to the development of both positive and negative processes in the soil of the base. Positive include soil compaction of the base within the deformation zone; it is formed directly under the base of the foundation during the growth of the load. Negative processes that lead to deterioration of soil properties include an increase in soil moisture in the upper part of the base, caused by violation of aeration conditions on the built-up site, seasonal freezing and thawing of the base soil, as well as leakage of process water through communications located near or at the spot of the building.

In large cities, an increase in the level of groundwater in significant areas is steadily recorded. Changes in hydrogeological conditions (increase or decrease in groundwater level) significantly affect the joint operation of the structure and the foundation. A decrease in the groundwater level causes an increase in the specific gravity of the soil due to the cessation of action, forces are weighed on its particles and can lead to the development of additional base sediments. Local leakage from water utilities, building water reduction are the causes of mechanical suffusion, which leads to an increase in their porosity and a decrease in strength and deformation properties. Moving groundwater can cause karst formation, which poses a significant risk to existing buildings.

The degree of wear of the foundations relating to different periods of their construction is different and does not always correspond to the age of the buildings. The reasons for the destruction of foundations or

their premature wear can be: poor quality of building materials; structural errors in the design of foundations; errors of a technical and technological nature made during construction and installation works.

The development of unacceptable deformations in the structures of operated buildings and structures may also arise due to errors or deviations from regulatory requirements made during research, design, construction and operation.

To make the best decision on strengthening and reconstruction of foundations, a thorough examination of the foundation and foundations is carried out. The whole complex of works is divided into the following stages.

The first stage consists in collecting and summarizing information about the building, its construction time and terms of operation, space-planning and structural solution and a detailed study of the available technical documentation.

The second stage is aimed at surveying the surrounding area and overground structures of a building or structure. This allows you to find out the cause of deformations and establish factors that negatively affect the foundation and foundations.

The third stage involves the examination of foundations and base soils from pits, the number and dimensions of which are determined by the state and change of the object and soil conditions. When examining foundations in open pits, the type and material of the foundation, its width and depth are established.

Samples of soil of undisturbed structure are also taken from the walls of the pit and its bottom to determine their type and physico-mechanical characteristics by the laboratory method.

Engineering and geological surveys are an integral part of work related to engineering surveys in the inspection of buildings and structures to be strengthened or reconstructed. Their tasks of engineering and geological surveys are: compilation of a general geological and lithological section in depth; establishing the hydrogeological regime and chemical composition of groundwater; determination of physical and mechanical properties of soils at the level of the bottom of the foundations and below it.

Findings:

1. The durability and normal operation of the foundations are influenced by a lot of factors that must be taken into account at the beginning of the preparation of projects.
2. Negative effects on the properties of base soils cause unacceptable deformations of the structure itself.
3. The design of foundations and foundations for

reconstructed buildings requires a set of works: collection of information about the building, construction; structural inspection to determine the causes and fac-

tors of deformations; survey of foundations and soils from pits, soil sampling; drilling of the wells.

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