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GENERAL PRINCIPLES OF TECHNICAL INSPECTION OF BUILDINGS AND STRUCTURES

ЗАГАЛЬНІ ПРИНЦИПИ ТЕХНІЧНОГО ОБСТЕЖЕННЯ БУДІВЕЛЬ І СПОРУД

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Recently, a significant part of brick houses and building constructed of brick in from the forties to the sixties have received both physical and moral wear and tear so they need modernization, to assess the efficiency of such building, it is necessary to carry out a set of measures, not least of which is the assessment of the building structures tension [1, 2].

This work is carried out in of the following sequence:

– preliminary visual inspection of the building, familiarization with the existing one documentation, drawings, etc.;

– development of the work program and calendar plan;

– detailed instrumental survey of building elements and the basis of its foundations;

– development of recommendations regarding the possibility of further exploitation buildings.

The survey of the supporting structures of the building is carried out in two steps and includes the following (in some way interconnected and complementary) stages[3]:

– visual inspection of constructions with sketching and photography;

– visible defects and tying them to the axes and height marks of the building;

– fixation of quantitative parameters: defects and damages, physical;

– mechanical characteristics of materials based on non-destructive methods of testing and establishing defects;

– description of defects.

In the process of visual inspection of load-bearing building structures is collect information about their structure and composition, technical condition and presence of visible defects such as [4,5]:

– cracks;

– exfoliation of protective layers;

– punctures and falling out of individual parts of structures;

– layering of structural materials;

– deflections, protrusions and uneven settlements of supporting structures;

– soaking, chemical decomposition, weathering of building materials and construction materials, etc.

The visual inspection is preceded by the collection of data on the architectural planning and constructive solution of a non-residential building, as well as familiarization with the technical and reference-normative documentation of buildings-analogues and structural elements. When examining the technical condition (except inspection of structures and elements, detection of visible defects and damage) measurements of violations of geometric dimensions, drawing up diagrams, sketches, photographing damage, cracks, peeling of protective material layer, corrosion of reinforcing steel, erosion of bricks, cracking of mortar, mechanical and physical damage to brickwork were done [6].

Special attention was paid to the organization of the surrounding terrain of territories.

Determination of the general technical condition is carried out initially according to individual structural elements, and then to the building as a whole, by the way assigning them to one of the technical condition categories.

The technical condition of the structures is normal – category of technical condition «1»: the actual forces in the elements and sections of the structure do not exceed permissible according to the calculation, there are no defects

and damages that reduce load-bearing capacity and durability or interfere with normal operation.

The technical condition of the structures is satisfactory – technical condition category «2»: in terms of operational qualities, the structure corresponds to the technical condition category «1», but there are partial deviations from the project requirements, defects or damage that can reduce the durability of the structure or partially violate the requirements of the second group of limit states , which in specific operating conditions of the structure does not limit the use of the object for its intended purpose [7, 8].

The technical condition of the structures is unusable – technical condition category «3»: the structure does not correspond to the technical condition categories «1» and «2» in terms of bearing capacity or the normal implementation of protective functions, but the analysis of defects and damage with verification calculations reveals the possibility of ensuring its integrity to repair, reinforcement or replacement.

The technical condition of the structures is emergency – technical condition category «4»: the requirements of the first group of limit states are violated (or it is impossible to prevent these violations), and the analysis of defects and damage with verification calculations shows the impossibility of guaranteeing the integrity of the structure before its repair, reinforcement or replacement (especially, if the «fragile» nature of the destruction is possible), or the possibility of the normal implementation of the protective functions of the structure is finally lost [8].

The building as a whole is assigned to one of the following technical conditions, depending on the technical condition of the load-bearing and enclosing structures.

The condition of the object «1» is normal, all its structures are classified as technical condition «1».

The condition of the object «2» is satisfactory, there are structures with a technical condition of category «2» and there are no structures of responsibility category A1, A or B with a technical condition of category «3» or «4». It is allowed to have a separate category of liability B with a technical condition of category «3», provided that this does not limit the use of the facility for its intended purpose.

Object condition «3» unsuitable for normal operation, there are constructions of responsibility category A1, A or B with technical condition of category «3» and no constructions of these responsibility categories with technical condition of category «4». The presence of separate categories of liability B with the technical condition of category «4» is allowed, provided that there is no danger from them to the life and health of people, property

and the environment. Until the completion of measures to restore operational suitability (or before decommissioning), the object must be used in a limited mode of operation [10, 9].

The condition of the object «4» is emergency, there are constructions of responsibility category A1, A or B with the technical condition of category «4». Operation of the object must be stopped until its operational suitability is restored or liquidated.

In accordance with the tasks and on the basis of the preliminary survey of the object and the accepted methodology of the survey of building structures, a technical survey report is drawn up [11].

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