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Damage To Brick-Walled Buildings And Effective Ways To Strengthen Brick Structures When Baratarafing Them

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Abstract: This article examines the causes of defects in brick walls, research into the actual operation of structural elements, and improvement of methods for the reliable elimination of cracks, deformations, damage and distortions that arise when assessing their technical condition.
Keywords: brick walls, complete set of walls with bricks, load-bearing and enclosing structures, defects and damage, service life, strength assessment, erosion environment, design errors, foundation height, wall reinforcement.

Introduction. Great importance was attached to the development of the construction sector in our republic. Special attention is paid to strengthening the material technical base of the construction industry, maintaining at the level of requirements the technical condition of the existing buildings being used, along with new construction of a huge size. In this direction, significant funds are allocated for the creation and improvement of the theory of scientifically based use and maintenance. In our institute, on the basis of orders of state organizations, various economic entities, certain scientific studies are carried out in the directions of checking the technical condition of the buildings being used, identifying injuries that have occurred in their main load-bearing and barrier structures, analyzing and eliminating the causes of their origin. Inspections are carried out on schools, colleges, medical institutions and similar buildings that are being used on the territory of the Fergana region. Below are the recommended methods for analyzing the characteristic damage detected in buildings with concrete foundations, the load-bearing walls of which were restored from crushed brick, and the restoration of their operational indicators.

An analysis of the results of inspections of directly used premises shows that defects and damage that form on brick walls are found to be caused by errors made in the design and deficiencies in use during the period of operation. Below is a review of their frequent occurrence (figures 1-5).

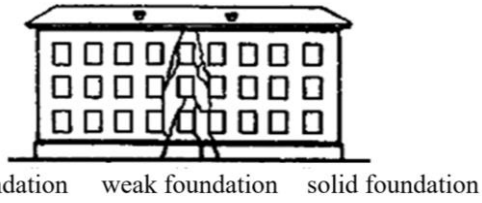

Figure 1. Sinking of the middle part of the building, cracks expand towards the bottom

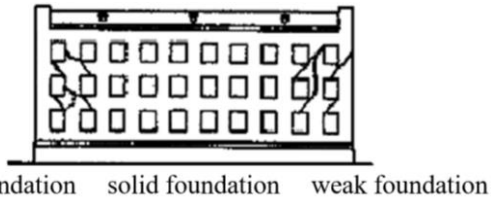

Figure 2. Deposition of edge parts of the building and the formation of oblique cracks

When the causes of the above defects and injuries were analyzed, the following were found:

- errors made in the inspection and project: buried pits in the assessment of the strength of the base on different plots, assessment of the presence of local bikr supports (concreted Wells), when constructing foundations of buildings of different floors, the presence of basement floors and rooms in part of the building and so on.k [1].

- deficiencies in the preparation of the base: the base grunt has been over-mined and the freshly spilled grunt has not been sufficiently compacted; the base grunt has been washed away in the drainage of groundwater in the trench.

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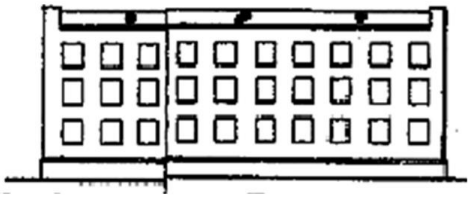

Figure 3. Sinking of a part of the building, the width of the crack in terms of the height of the building is constant

- errors made in the inspection and project: buried pits in the assessment of the strength of the base on different plots, assessment of the presence of local bikr supports (concreted Wells), when constructing foundations of buildings of different floors, the presence of basement floors and rooms in part of the building and so on.k.

- deficiencies in the preparation of the base: the base grunt has been over-mined and the freshly spilled grunt has not been sufficiently compacted; the base grunt has been washed away in the drainage of groundwater in the trench.

- disadvantages in the construction of the foundation: poor-quality concrete, application of the mixture, the use of stones with insufficient strength and durability in an absorbent environment, etc.k.

- disadvantages allowed in use: the fact that water is allowed to flow to the base, the base grunt is washed with atmospheric precipitation, household or technological waters (especially on plots with weak or precipitating grunts); the deposition or mining of grunts that cause the walls to get wet or cause the foundations to freeze and multiply [2,3,4,5,6].

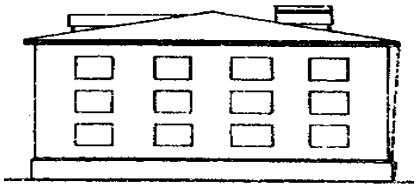

Figure 4.Wall displacement-wall turning from vertical

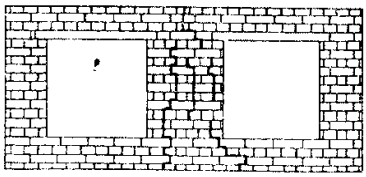

Figure 5.Formation of vertical light in Oradevor and sarbastas

- errors in the project: the fact that the longitudinal wall does not have enough biquidity, the absence of transverse fasteners, the formation of a large repellent (raspor) force on the strophiles.

- disadvantages in construction: the fact that reinforcement nets are not laid at the intersections of the walls or their quantity is insufficient.

- disadvantages in the period of exploitation: the wetting of the base grout under the wall and the sinking of the wall from the weakening of the brickwork.

Poor quality of brickwork-the size of the seams. Low-grade brick and mortar, the flight of the mixture in the seams, the breakdown of the brick. Oradevors are not reinforced brickwork. Due to changes in technology in the structure or an increase in load from new equipment, an increase in stresses affecting the orayopma and oradevors has led to the formation of cracks.

Results and research discussion. Brick is a common type of damage to walls and is the presence of a pout of salt stains on wall surfaces and a violation of the layer of plaster. This situation occurs when low frost resistance bricks are applied, when a poor-quality, low-brand mixture is used for plastering, the wall surface is often moistened for various reasons. In eliminating this type of defect, the wall surface is completely cleaned of the demolition materials, the damaged areas of the Brickyard are restored, the torkret method is covered with a mixture no lower than the mark M100, and then a finishing plaster is formed. At the necessary points, measures are taken to prevent the wall surface from being holed up by rainwater.

Breakage of individual areas of Wall brickwork occurs as a result of the application of low-quality brick and mortar, as well as periodic wetting of the skin, freezing and melting of the skin in the winter season. To eliminate such visible damage, it is carried out to carry out the weakest sections of the skin at a thickness of 0.5-1.0 bricks in a quality brick and mortar, if necessary, to dry the wall, protect it with quality plaster and

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other types of coatings. The brick brand used in the restoration should not be lower than the M75, the Shell brand should not be lower than the M50 [7,8,9].

In cases where the brickwork of the walls is wetted with regular rainwater, the load-bearing capacity of the skin is sharply reduced, there is a migration, violation of coating tiles and plasters. In these cases, in addition to the above, coating skins, protective coatings and plasters are performed using special hydrophobic additives (GKJ-10, gkj-11 - in the amount of cement in the mixture by 1.5-2%). Also hydrophobic compositions can be formed either with a brush directly on the wall surface, or a protective layer that is sprayed directly.

The layering of the foundations and the sokol part of the walls, built of crushed brick, is observed in cases where the seams were not suppressed on the basis of requirements when carrying out the brickwork, the connection was broken, low-quality brick and mortar were applied, as well as the amount of load falling on the foundation exceeded its estimated value. To eliminate such a type of violation, methods are used to strengthen and strengthen the skin with the help of a reinforced concrete coating, expanding the width of the foundation at the expense of additional picking, building additional transverse reinforced concrete beams, and expanding and strengthening the foundation with studs (from concrete, reinforced concrete or solid brickwork). In some cases, the foundation brickwork can also be reconstructed using the liquid cement mixture injection method. In concrete foundations, breakage of the upper layers of concrete (up to 5-10 cm or more thick) is common in practice. The reason for this is the seasonal rise in sizot waters with high absorbency, the application of concrete, which has insufficient resistance to aggressive environments [10,11]. To eliminate this type of damage, a layer of initially impregnated concrete is removed to form a reinforcement layer of aggressive environmentally resistant concrete at least 10cm thick. In this case, a base part equal to 15-20 cm is formed at the bottom of the reinforcement layer, new concrete is reinforced if necessary, in any case, reliable bonding of new and old concrete is ensured.

In many buildings, it was found that indissoluble transverse cracks form on the slab of stepped foundations, as well as its uneven deformation. Analysis has shown that this type of damage occurs as a result of incorrect design of the foundation structure (incorrect selection of dimensions), an increase in the load falling on the Foundation, a decrease in the load-bearing capacity of the foundation grunt for various reasons. In this case, in order to restore the load-bearing capacity of the foundation, its dimensions are coordinated to acceptable dimensions based on the calculation results, an additional reinforcing layer is formed by ensuring reliable connection with old concrete, if necessary, the transfer of part of the load to the strengthening parts is carried out, the base grunt is strengthened in the.

Horizontal cracks in the height of the foundation are formed and break down, while they are rare in construction practice, they are subject to damage and breakdowns of the safe type. Such a type of violation occurs due to improper assessment of the properties of the base grunt, insufficient compaction of the deposited grunt during the base preparation period, as a result of allowing a large amount of water to flow under the foundation during the period of use, overwintering of the grunt along the length of the foundation, in some cases due In the event of such a violation, the polyunsaturated grunt next to the foundation is completely removed, its place is filled with a mixture of large sand, sheben, the horizontal crack is lost in the cementing method, the source of water flowing under the foundation is eliminated, the groundwater level is taken measures to reduce from the specified height [12,13,14,15].

The analysis of the results of the technical inspections carried out, the identification of the causes of the occurrence of defects formed in brick structures, the study of the actual work of structural elements, the R & D carried out to assess their technical condition gave the opportunity to improve methods for reliably eliminating cracks, deformations, damage and breakdowns formed and develop methods and solutions that are completely. When reinforcing brick walls, the following methods are used: restoration of new brick cladding; plastering with reinforcement; reinforcement by means of rolled profiles; reinforcement by means of drawers; reinforcement by means of concrete or reinforced concrete flange, etc [16,17,18,19,20].

Conclusions. These methods in some cases require a lot of metal consumption, the technologies for performing work will be complex. In addition, the appearance of buildings is not always at the level of demand. For this reason, methods of strengthening brick walls by means of tensile reinforcement sterjens have been developed, analyzing the carried out technical inspection work and studying the shortcomings of existing methods, and they have been successfully used to strengthen a number of buildings.

Improving existing strengthening methods serves to increase the efficiency of reconstruction and overhaul work. Developed amplification methods differ in their simplicity and efficiency from existing methods. The use of these methods in a number of construction sites has shown their advantages, has been well received and positively reviewed by developers and practicing builders.

The application of the above methods in construction practice serves to bring the operational indicators of the buildings being used to the level of requirements established in the standards and regulations of construction and ensure their reliability.

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