



DEVELOPMENT OF EFFECTIVE METHODS OF STRENGTHENING DAMAGED WALLS OF BUILDINGS TO BE RECONSTRUCTED

Mirzababaeva Sakhiba Mirzaakbarovna
Fergana Polytechnic Institute, senior teacher
s.mirzaboboeva@ferpi.uz (ORCID 0000-0002-6183-4688)

Abobakirova Zebuniso Asrorovna
Fergana Polytechnic Institute, Ph.D. Associate Professor
z.abobakirova@ferpi.uz, (ORCID 0000-0002-9552-897X).

Mirzayeva is the daughter of Zarnigor Alisher
Fergana Polytechnic Institute, Assistant
z.mirzayeva@ferpi.uz, (ORCID 0000-0002-9552-897X).

Solijonov is the son of Foziljan Sadiqjan
Fergana Polytechnic Institute, assistant
f.s.solijonov@ferpi.uz (ORCID 0000-0003-4627-7905).

Abstract:

The article presents defects formed during the operation of buildings and structures, in particular, defects of brick walls and their reinforcement in reconstructed buildings.

Keywords: reconstruction, reinforcement, brick wall, hydrophobic additive, cement mortar, deformation, destruction, foundation

In Uzbekistan's dry hot climate and seismic conditions, it becomes more difficult to solve the issues of strengthening wall structures of buildings. Construction practice shows that in the first 3-7 days after the completion of concreting works, the formation of penetration cracks in the concrete, a sharp decrease in strength, and a significant decrease in the load-carrying capacity of the structures occur. , their quality indicators deteriorate. Even during the period of use, the dry hot climate has a significant negative effect on the structural elements of the buildings, this situation is evident in the inspections. Many cases of premature cracking, decay and deterioration of structural elements used under direct solar radiation - walls and wall panels, parts of open structures - have been recorded in practice. The scientific works of a number of scientists were used in researching ways to overcome these issues [1-24].

As a result of earthquakes, walls and columns of buildings are damaged at various levels, cracks are formed in them, deformations increase [1-5].

The conditions of the construction site have a decisive influence on the main indicators of buildings and their structural elements during their use, determine the nature and extent of damage, distortions, cracks and deformations. Therefore, it is necessary to take into account all factors when determining the methods of strengthening the wall structures, eliminating the



identified defects, taking into account the specific characteristics of the working conditions of the buildings and their structures.

The most common type of damage to brick walls is the appearance of salt stains on the wall surfaces and damage to the plaster layer. This situation occurs when a brick with low frost resistance is used, when a low-quality, low-quality mixture is used for plastering, when the wall surface is often wet for various reasons. When eliminating this type of defect, the wall surface is completely cleaned of spoilage materials, the damaged areas of the brick skin are restored, covered with a mixture of grade not lower than M100 using a shotcrete method, and then a finishing plaster is made. If necessary, measures are taken to prevent the surface of the wall from getting wet with rainwater [6-8].

Deterioration of individual parts of the skin of the wall brick occurs as a result of the use of low-quality brick and mixture, as well as periodic moisture of the skin, freezing and thawing of the skin in the winter season. In order to eliminate such damages, the weakest parts of the skin are re-made with high-quality brick and mortar with a thickness of 0.5-1.0 bricks, if necessary, the wall is dried, protected with high-quality plaster and other types of coatings. The grade of brick used in restoration should not be lower than M75, and the grade of mixture should not be lower than M50 [9-14].

If the brick skin of the walls is wetted by regular rainwater, the load-bearing capacity of the skin of the wall decreases sharply, the displacement and damage of the covering tiles and plasters is observed. In these cases, in addition to the above, the skin surface is covered with special hydrophobic additives (GKJ-10, GKJ-11 - in the amount of 1.5-2% compared to the amount of cement in the mixture). It is also possible to create a protective layer by brushing or directly spraying hydrophobic components directly onto the wall surface.

The foundations and walls built of solid bricks were damaged by layering, the seams were not pressed in accordance with the requirements during brick picking, the connection was broken, low-quality bricks and mixtures were used, and the amount of load falling on the foundation exceeded its calculated value. is observed in cases of absence. To eliminate this type of damage, the skin is strengthened on one or both sides with the help of a reinforced concrete cover, the width of the foundation is expanded at the expense of the additional skin, additional transverse reinforced concrete beams are built, and pillars are placed on the foundation (concrete, reinforced concrete or strong brick from the skin) methods of expansion and strengthening are used. In some cases, the skin of the foundation brick can be restored by injecting a liquid cement mixture [15-23].

Within the framework of these studies, as a result of the research of existing strengthening methods, it was possible to develop new, effective methods, which received a positive assessment from designers and practicing builders. Below are pictures and diagrams illustrating these new, effective methods (Figures 1-5).

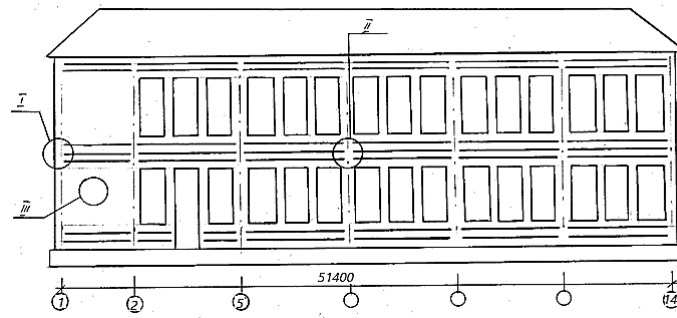


Figure 1. Scheme of strengthening the external brick walls of the building by placing pre-strengthened reinforcements (main facade)

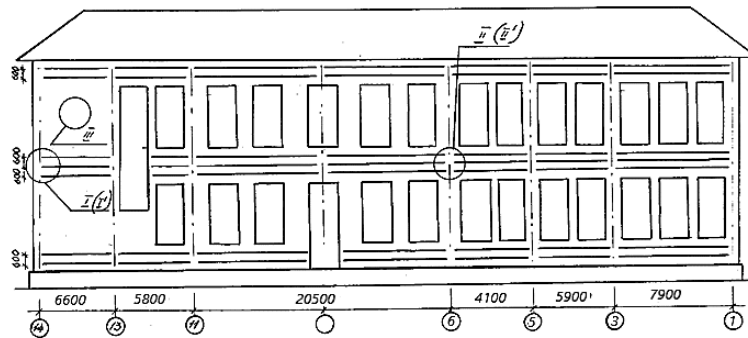


Figure 2. The scheme of strengthening the external brick walls of the building by placing pre-strengthening reinforcements (courtyard facade).

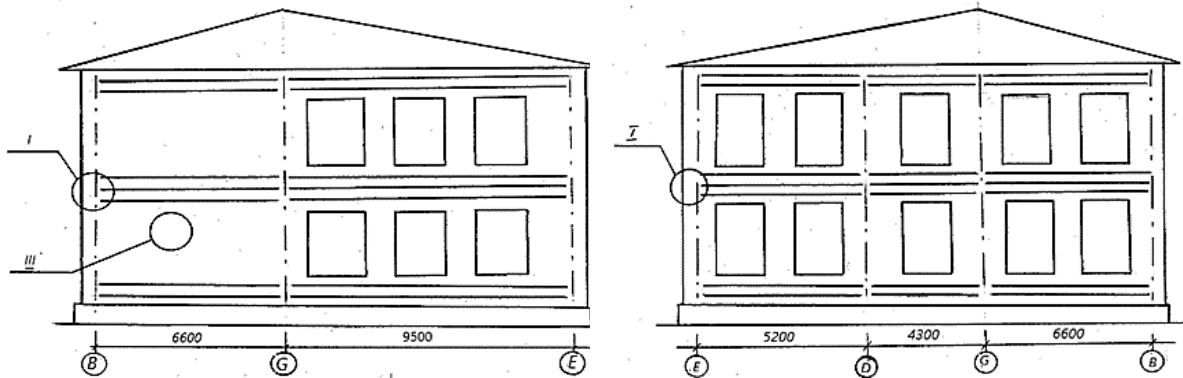


Figure 3. The scheme of strengthening the outer brick walls of the building by placing pre-strengthening reinforcements (side facades)

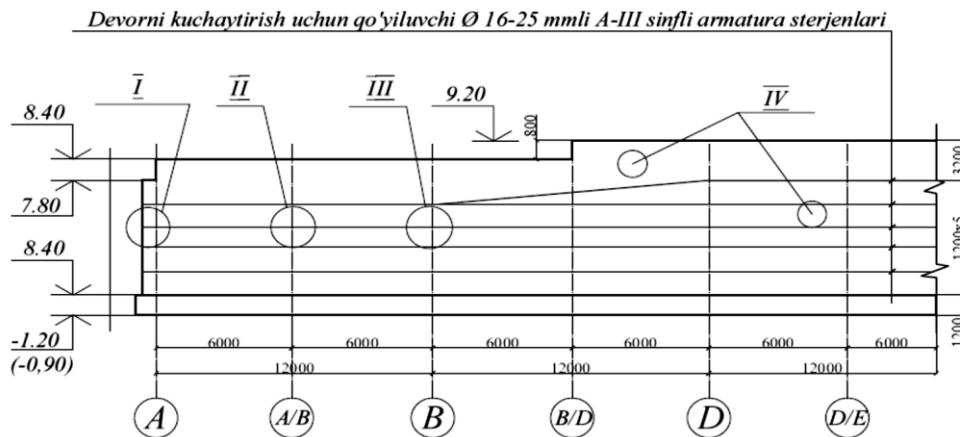


Figure 4. The scheme of strengthening the brick walls of the building with the help of pre-strengthened reinforcements

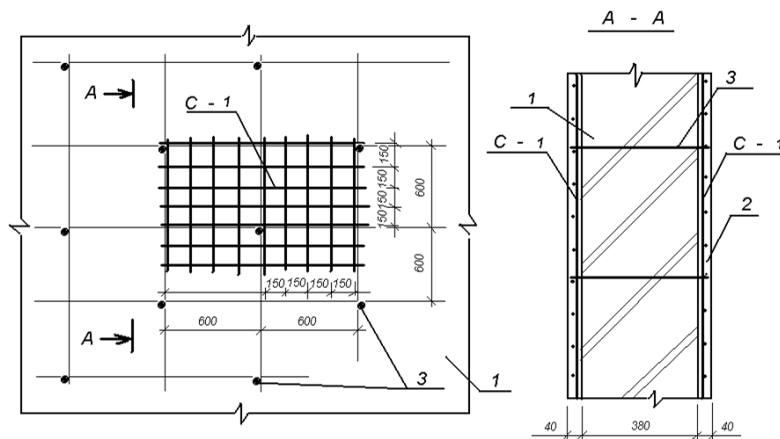


Figure 5. Scheme of strengthening 380mm thick brick walls: 1-existing brick wall; 2-M100 large sand-cement plaster; 3. A-II class rods with a diameter of 10 mm connecting the reinforcement nets

Conclusion: As a result of collecting sufficient scientific and technical data on the given problem, systematizing them, analyzing and summarizing the results, studying the issue in detail, identifying the urgent work that needs to be done, gave an opportunity to implement and draw the necessary conclusions.

Buildings intended for various tasks, their load-bearing and barrier structures, during operation, are exposed to forces, external environment, atmospheric precipitation, wind, snow, temperature, solar radiation, as well as during design, restoration or Cracks, cracks, damages, deformations and distortions may occur as a result of mistakes made, as well as due to the lack of necessary maintenance. In order to ensure the suitability of buildings and structures during the entire accounting service period, they must undergo technical inspections and inspections from time to time, timely elimination of defects, current and capital repairs, quality maintenance is required.



In the performance of these tasks, it is important to check the technical condition of buildings and structures, to accurately and correctly assess the actual condition of load-bearing and barrier structures in them, to eliminate existing defects in a qualitative and uncomplicated way, and to apply the necessary strengthening measures when necessary. becomes important. It is very important to develop and apply the most optimal, reasonable solutions in all respects.

At the same time, the organization of high-quality and appropriate technical service during the period of operation after reconstruction and capital repair of buildings and structures plays a decisive role in ensuring their reliable operation during the entire estimated service life. plays

The inspection of each facility requires a unique approach, which requires careful consideration of the characteristics of the building under consideration, working conditions, and actual indicators of the project and the constructed building. In this way, the issues of bringing the technical condition of the buildings and structures to a state in accordance with the requirements of the current QMQ and other regulatory documents are effectively resolved in all respects.

In many cases, the deterioration of the roofing, water and sewage systems of the buildings in use and their failure to eliminate them leads to the development of existing defects in other structural elements on a larger scale, the formation of new ones, as a result of which the general technical condition of the object deteriorates, the load of the structures is increased. carrying capacity, operational performance of the building decreases, service life decreases. As a result of the lack of protection of foundations and foundations from rain and snow, subsidence occurs, unacceptable cracks and deformations are formed in structures.

As a result of mistakes made during reconstruction and capital repair, it is observed that boundary conditions occur in constructions: restoration of new roofs, installation of equipment leads to increased loads, as a result of which cracks are formed in building elements, an increase in drafts occurs. will come.

Deterioration of structures due to corrosion is also a common phenomenon, which reduces the performance of buildings and sometimes causes accidents.

Complete elimination of defects identified as a result of technical inspection in time, restoration of work capacity of load-bearing structures, ensuring reliability, maintenance of operational indicators of buildings and structures at the level of normative requirements, safe use of them for a long time serves as collateral [23-24].

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