Analysis Of The Technical Condition Of The Historical Monument Model Creation And Calculation And Based On Computer Program

Khodjaeva Zulfiya Shukhratovna[1]
[1]Tashkent University of Architecture and Construction, docent

Abdujabborova Shakhribonu[2]
[2]Tashkent University of Architecture and Construction, master`s student

ABSTRACT

Currently, issues related to preservation and repair of historical monuments are considered important in our country. This article provides a priority analysis on this topic. Thousands of monuments and monuments have appeared in our country. Much attention is paid to their maintenance and repair, as well as to the processes of repairing and creating objects. In the article, the topic "Study of the technical condition of the Somonii mausoleum and creation of a model on the basis of computer software, testing of its static and dynamic loads and evaluation of its technical condition" is considered as a priority. 3D models of the mausoleum were created and its effects on dynamic and static loads were analyzed in a computer program. At the same time, information technologies are important in studying the stress-deformation state of the architectural monument, applying dynamic and static loads to them and analyzing their results, and the research in this direction is widely seen in the article. . The scientists who have found their place have expressed their opinions about the bricks and mixes of the architectural monument, their mechanical and durability indicators. On the subject of this article, studies have been carried out due to the fact that scientific and research works aimed at protecting historical architectural monuments and revealing them to new generations are very important in our country

Keywords:

1. Introduction.

The independence of our country has created favorable conditions for restoration and repair of cultural heritage left by our ancestors, historical monuments, analysis of the technical condition of holy places and their conservation. The legal basis for studying and carefully preserving our historical, cultural and spiritual heritage has been created. Architectural monuments located on the territory of our country have a great place in world civilization. These objects define the historical cities, thousands of architectural and historical monuments that have been formed over the centuries, the level of culture and science of their time. On the territory of our republic, measures aimed at studying more than two thousand architectural monuments, more than three thousand archaeological monuments, about one thousand monumental art monuments, creating their passports, repairing them, conserving them and passing them on to future generations are being carried out, and effective work is being carried out in this field. This article consists of studying the technical condition of the Somoni mausoleum in the

memorial monument, creating a model based on computer software, testing it for static and dynamic loads, and evaluating its technical condition.

Attention to the preservation and repair of monuments is recognized worldwide. One of the important tasks is to evaluate the technical condition of the cultural heritage objects in Bukhara and apply the results obtained on the history of their restoration, conservation and reconstruction to the architectural monuments located in Central Asia. Nowadays, preservation of historical architectural monuments is considered as a universal problem.

This article examines the technical condition of the Somony Mausoleum monument. Study of the stress-deformation state of the architectural monument. Calculation of them on the effect of dynamic and static loads. It consists of analyzing the results and making recommendations. A 3D model of the Somoni mausoleum has been created. Calculations were performed using accelerograms. The dynamic and static loads of the Samonii mausoleum were calculated in a computer program.

2. Materials and methods.

Mechanical and strength indicators of bricks and mixtures of architectural monument Grajdankina N.S. and several scholars are fully cited in his works [1].

The process of making bricks required a lot of time and labor. They were mainly due to the fact that it required manual labor to bring the clay to a uniform shape, as well as the complexity of the composition and the complexity of the preparation process. Until now, the composition of Muslim bricks and the technology of grinding have not been fully studied. Mechanical and strength indicators of bricks and mixtures of architectural monument Grajdankina N.S. and several scholars are fully cited in his works [1].

The process of making bricks required a lot of time and labor. They were mainly due to the fact that it required manual labor to bring the clay to a uniform shape, as well as the complexity of the composition and the complexity of the preparation process. Until now, the composition of Muslim bricks and the technology of grinding have not been fully studied. Physical and mechanical indicators of ceramic bricks used in architectural monuments correspond to 8.0 – 11.5 MPa [2]. The compressive strength of the construction mixture is 2.0 – 6.0 MPa. The average strength of bricks when mixed with mortar is 0.05 – 0.15 MPa.

The structures of the Samonite mausoleum have been restored over the years and have now been completely restored to their original state. Most of the land area of our republic is located in the seismically active area, and the analysis of statistical data in recent years shows that the seismic activity on the earth has increased significantly. Taking into account the above, the calculation of the seismic effects that can be expected in the mausoleum structure and the preliminary determination of damages, as well as the research of the seismic strength using the existing numerical methods and the assessment of the seismic strength are considered urgent issues [3].

3. Results and discussions.

Calculations were carried out using the finite element method in the Lira software package by calculating real accelerograms under impact, and the state of deformation and stress in structures was determined [4]. In the course of the calculation, in order to evaluate the brick constructions in mausoleum constructions according to their category, a three-dimensional calculation model was modeled, deformation-stress states under the influence of real accelerograms were determined and their mutual values were compared.

A side, top and three-dimensional view of the mausoleum structure is shown below (Figures 1, 4).

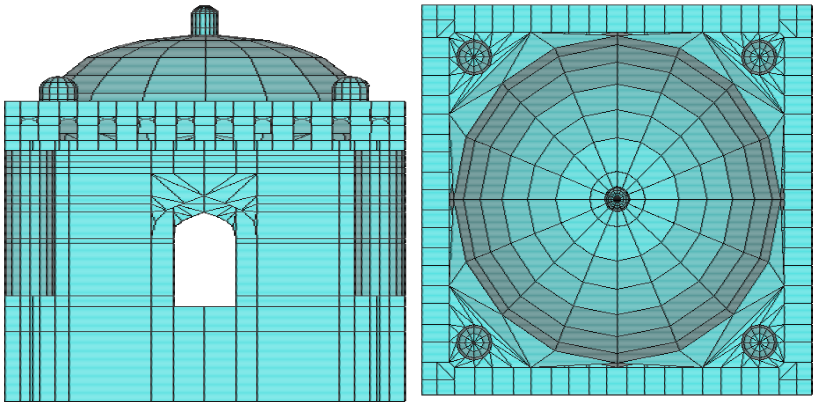
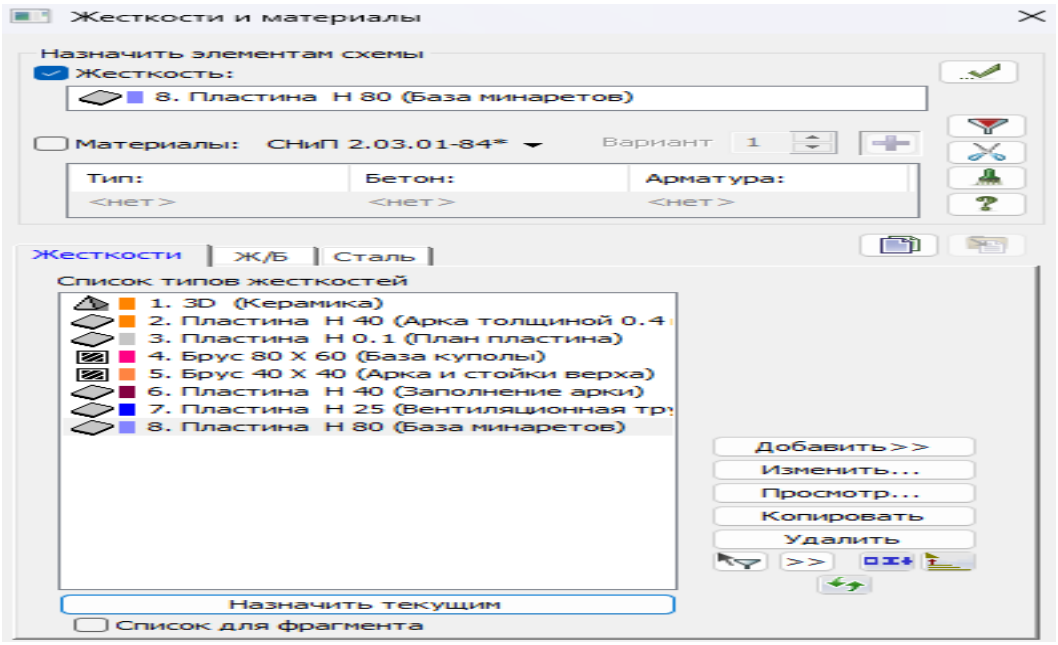
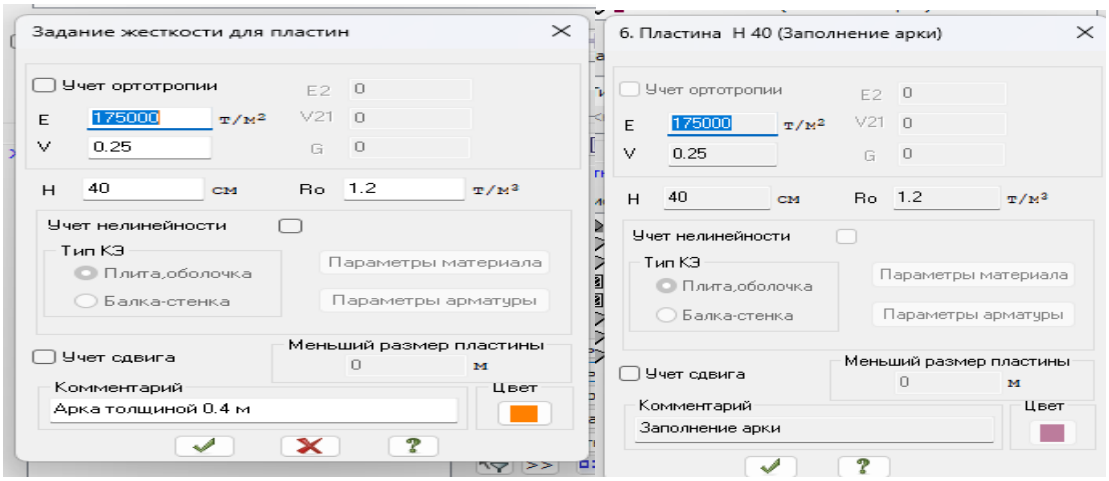


Figure 1. Calculation model of mausoleum building side and top view





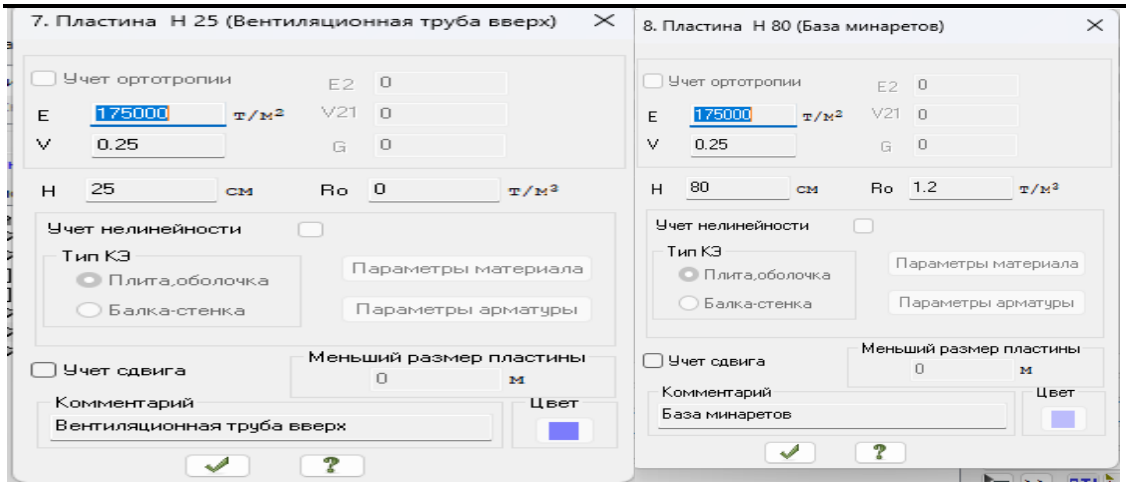


Figure 2. Information included in the Element Size dialog box and the Element Size dialog box

As a result of engineering-seismological measurements of the area in microseismic effects for the city of Bukhara in the calculation of the constructions of the Somonii mausoleum using the finite element method using the Lira program Seismic effects that may occur in 50 years were calculated in the form of an accelerogram, and the state of deformation and stress of brick structures was studied. The duration of this accelerogram is 10.06 s with a step of 0.01 s. Multiplier coefficient was adopted in accordance with the intensity of 7 points on the scale of earthquakes. Some of the accelerogram values are presented above in graphical and numerical form. During the calculation, seismic waves are considered to act in longitudinal, transverse and vertical directions. The stress-strain states in the original and reinforced cases of the peshtok structure are presented in the form of isopolyes below.

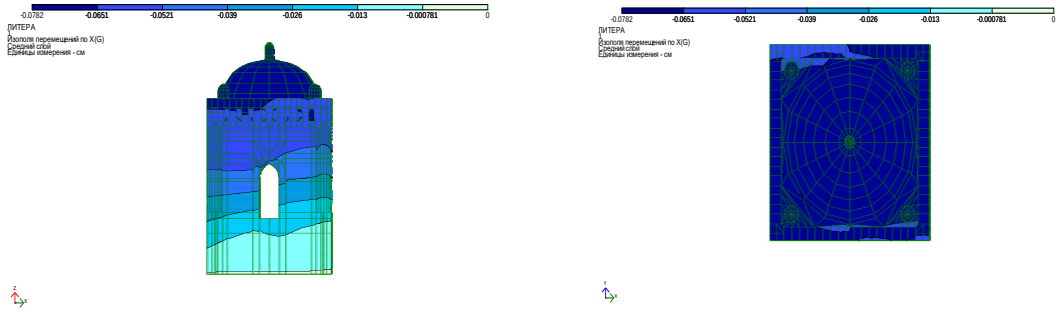


Figure 3. The isopoly of displacements of the mausoleum structure in the X direction

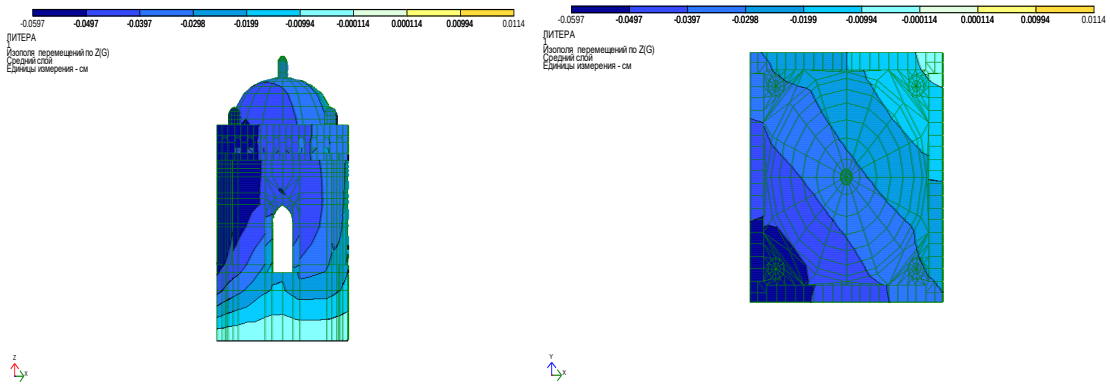


Figure 4. In the U direction of the mausoleum structureisopoly of displacements

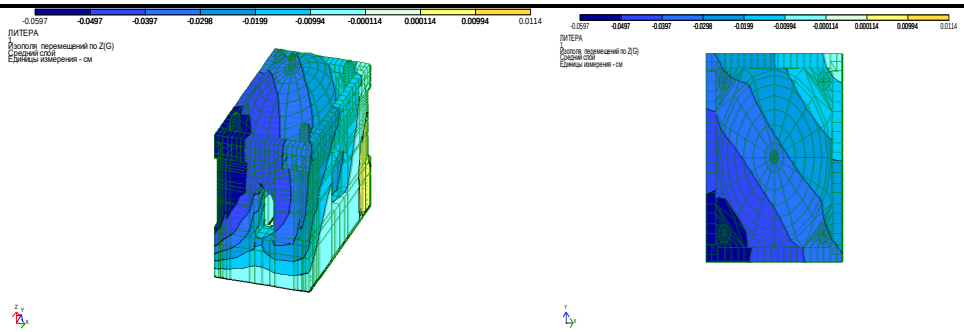


Figure 5. In the Z direction of the mausoleum structure isopoly of displacements

a)

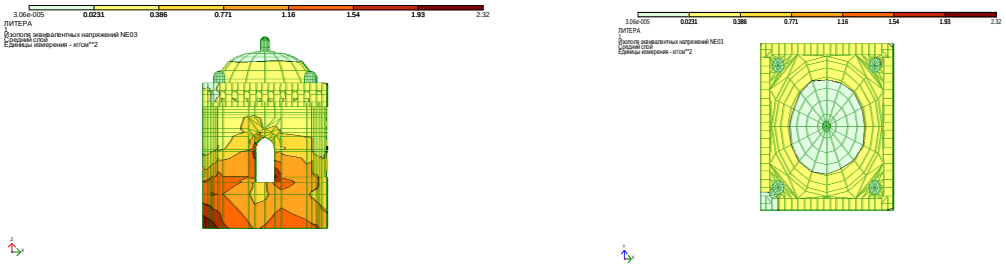


Figure 6. Equivalent extensor of the mausoleum structure stress isopole

4. Conclusion.

The following conclusions can be made as a result of comparing the isopolyes reflecting the deformation-stress states of the structures of the mausoleum structure based on the results of numerical calculations:

- it was determined that the strength of the bricks in the jointing of the roof structure near the arch structure of the building under the influence of seismic forces of 7 points intensity does not respond;

- displacements of the structure in the longitudinal X direction due to the original seismic forces were 0.0782 cm, displacement in the transverse U direction was 0.0787 cm, and displacement in the vertical Z direction was 0.0597 cm.

- it can be estimated that the reason for the displacements being small is the massiveness of the structure's walls;

- stresses in brick walls in the supporting parts of the roof and arch structures of the building under the influence of seismic forces of intensity 7 is 2.32 kgs/cm2, i.e. according to the ability to resist seismic effects based on clause 3.5.4 of the normative document QMQ 2.01.03-19 "Construction in earthquake regions", It was determined that the threshold value for type II skin is 180 kPa>R_t^B≥120kPa (1.2 kgk/cm2) [4].

References

1. Abdurashidov Q.S., Kabulov F.R.. Engineering problems of architectural memories. Tashkent "Science" 2009.
2. Abdurashidov Q.S. State and future of constructions of architectural

monuments in Uzbekistan. 2001. TAKI. pp. 16-17

3. Ahmedov M. , Oralov A. "Repair and reconstruction of architectural monuments". Textbook. TAQU. 255.
4. Z.Sh Khodjaeva, I.I Sabitova. Calculation of the effects of static and dynamic forces of the Somoni mausoleum on the basis of the Lira-Vizor program. - GOLDEN BRAIN, 2023. - T. 1. – No. 20, S. 85-91