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STRENGTH AND DEFORMABILITY OF MASONRY FROM TECHNOLOGICAL LOADS AND TEMPERATURE AND CLIMATIC INFLUENCES DURING THE CONSTRUCTION OF BUILDINGS

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Annotation: In the article, stone layers, which usually have a higher elastic modulus than the mortar, should receive less transverse expansion, and the mortar more.

***Keywords*:** Construction, strength, seismic, masonry, mortar, material, temperature, humidity.

Structural strength, seismic resistance and operational reliability of buildings, First of all, they depend on the strength characteristics of the materials used for the manufacture of structures. As you know, the strength of materials decreases over time due to their wear, which depends on many factors. One of these factors is the temperature and humidity of the environment. When erecting multi-storey buildings from small-piece materials (brick, small-piece concrete blocks, etc.), the quality control of the supplied materials is carried out by factory laboratories and is accompanied by product quality certificates. And the quality control of work in production is carried out by the GASN. Operational quality control of ready-mixed concrete supplied by concrete plants, or concrete mass prepared at the construction site, is not immediately possible. Ensuring the required quality of concrete at the construction site depends on many factors [1].

Brick and ceramic stones are the most common wall materials used in residential, civil and industrial buildings. The need to predict the mechanical behavior of brickwork in the elements of building structures in a complex stress state, caused, in particular, by uneven settlements of buildings, requires the development of models and methods for solving problems of the mechanics of deformable media, including those based on modern concepts of the mechanics of composite materials. Brick (stone) masonry is a monolithic heterogeneous material consisting of stones and joints filled with mortar, in some cases the masonry can be reinforced with steel mesh.

The strength of masonry mainly depends on the strength of stone and mortar. In this case, special attention should be paid to stones with a regular geometric shape (i.e., absolutely flat horizontal surfaces (beds of stone), dressing of vertical seams and stone sizes.

The strength of the masonry is also influenced by the unequal deformability of the stone and mortar. As is known, masonry under the influence of a load is compressed in the direction of the force and expands in the transverse direction. In this case, the layers of stone, which usually have a higher modulus of elasticity than the mortar, should receive a smaller transverse expansion, and the mortar should receive a larger one. However, both layers are interconnected by friction and cohesion forces and, working together, receive the same expansion. As a result, an interaction of forces occurs between the layers of stone and mortar, affecting the strength of the masonry.

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In this regard, it is very important to correctly take into account the peculiarities of the behavior of brickwork in the conditions of construction and, first of all, it should be taken into account when designing the load on floors from stored building materials (brick, cement, lime, etc.) as well as temperature and climatic influences in certain periods of construction, when the specific properties of the masonry become essential - creep, shrinkage of the mortar and progressive cracking.

The climate of the territory of the Republic of Uzbekistan, located in the Central Asian region, is sharply continental with hot summers and cold winters. During the summer season, daytime temperatures rise to +45°C, and the night falls to +25...28°C. The relative humidity of the environment, on the contrary, decreases during the day to 12...17 %, and rises to 20...40 % [2]. In summer, the brick walls of buildings, in addition to the ambient temperature, are affected by the sun's rays. From exposure to sunlight, the temperature on the surface of the brickwork reaches up to 50-60°C [3].

Brickwork under these conditions is in a complex stress-strain state. On the surface of the brickwork, oriented in the direction of sunlight, the deformation from temperature and sunlight will be greater than on the opposite surface of the masonry. In this case, the masonry is not deformed symmetrically. If the brickwork is free, then the masonry is deformed freely and temperature stresses do not appear in the masonry. When the free deformation of the masonry is limited (found in the walls of multi-storey buildings), thermal stresses arise in the masonry.

Neglect of these factors can lead in practice to undesirable consequences, including a reduction in the service life and even an expansion of the masonry.

It follows from the foregoing that the bearing capacity of an element (a pillar, a wall and a brick building as a whole) depends on the strength of the masonry and the nature of the acting loads and influences. The appearance of cracks, if they occur as a result of overvoltage from technological loads (i.e., from the storage of building materials) and temperature and climatic effects on the masonry during compression, is unacceptable, since masonry is a brittle material, slightly deformable. When cracks appear in the masonry, the element is usually emergency and the further development of cracks proceeds without increasing the load and, as a rule, leads to the destruction of the element.

Cracks that occur as a result of masonry overstressing during compression or shear should not be confused with cracks that sometimes appear in walls as a result of uneven settlement of foundations. Such cracks, if they pass far from the corner of the building and divide the wall along the length into parts, each of which is independently stable, are not emergency and do not pose a danger to the wall. But here, too, appropriate measures are needed to stop further deformation.

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