



# ON PROTECTION OF STONE MATERIALS FROM DESTRUCTION

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## ABSTRACT

*The article describes the methods of protection against natural landslides used in the construction of buildings and structures, utilities.*

**KEY WORDS:** *Avanfluatization, hydrophobic substance, fluxes, protective layer, fillers.*

## INTRODUCTION

Natural stone materials have been used in the construction of buildings and structures since the early days of world civilization. Historical monuments made of natural stones can be found in all regions of the globe. It is known that the Egyptian pyramids, the monuments of Mesopotamia and Jerusalem, the pyramids of India, the monuments of Mexico were built on the basis of limestone, marble, granite and ordinary pebbles. It is known that the floors and foundations of unique architectural monuments, such as the Greek amphitheater, Venetian monumental buildings, St. Petersburg, the Moscow Kremlin, were built of natural stone.[1]

## OBJECTIVES

In the construction of cultural monuments in the ancient cities of our historical cities - Shakhrisabz, Khiva, Bukhara, Samarkand, Termez, Tashkent and neighboring countries such as Otrar, Turkestan, Old Urgench, Osh, Khojand, local natural stones were processed and used in traditional ways. When we study the samples of natural stones used in

the construction of buildings and structures, engineering communications of these cities, we see that their properties have not changed.

Rocks are used as raw materials for natural stone materials. Rocks are formed in the earth's crust as a result of complex geological processes. They have a certain composition and structure and are composed of different minerals. Minerals are formed as a result of physicochemical processes in the earth's crust. Although there are more than 2,000 types of minerals in nature, there are about 50 minerals in rocks. Rocks are monomineral and polymineral.

In the repair of buildings and structures, natural stones are used in the foundation, walls, floors and other parts as a decorative material or structural material, processed in several stages. Crushed stones are divided into fractions and used as aggregates in the production of mixtures of different compositions, concretes and other composite materials. They can be used in the construction system even in the case of unprocessed rock, gravel - sand.[2]

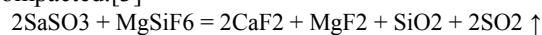


## METHODOLOGY

Natural stone materials in the structure of buildings and structures can be gradually decomposed under the influence of physical and chemical processes, microorganisms and plants in the environment during use. Sudden changes in temperature, water and ice cause cracks in the rock. These cracks are caused by the deposition of various substances in the air and groundwater - oxygen, carbon dioxide, sulfates, organic compounds, as well as oxidation, melting, carbonization in the rock, causing the erosion of the rock. Erosion resistance of natural rock materials depends on the chemical composition, structure, density of minerals and the influencing factors of nature. Constructive measures shall be taken to prevent the natural stone materials used in the constructions from eroding or deteriorating, or a protective layer shall be formed on their surface. Constructive measures include the removal of water from the surface of the stone material, as well as the formation of a dense and smooth surface due to sanding and polishing.

## STATISTICAL DESIGN

These substances combine with the minerals in the stone, closing the pores and making it difficult for water to enter the stone. Salts of silica hydrochloric acid (eg  $MgSiF_6$ ) are used as fluorides. Fluates react with the mineral calcite ( $CaSO_3$ ) in the rock, and the pores are filled with water-insoluble  $CaF$ ,  $MgF_2$ , and  $SiO_2$ , and the rock surface is compacted.[3]



## RESULTS

As a result, the strength of the stone material increases, its resistance to cold and exposure to chemical solutions. Surfaces of non-carbonate rocks are first treated with solutions of calcium salts (e.g.  $CaSi_2$ ) and then impregnated with soda and fluorides. This method is called avant-garde.

One of the most effective ways to protect stone materials from abrasion is to hydrophobicize their surfaces, that is, to cover them with waterproof substances. Silicone-organic liquids of GKJ-10, GKJ-94 brands are used as hydrophobic substances.

## SUGGESTIONS

The application of such technologies provides great economic efficiency in the perfect repair and reconstruction of architectural monuments and rare monuments. The development of research work related to the widespread use of stone materials, which are the most ancient and at the same time "universal" construction raw materials in construction and ensuring their longevity during technical operation, is a pressing issue in urban planning of our country.

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