

CORROSIVE EFFECT OF THE GROUND WATER ON STRUCTURES AND WAYS OF THEIR PROTECTION

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Hydrogeology is a science that deals with the study of groundwater and the impact on the environment. Groundwater has a devastating impact on retaining walls and other structures. Due to the numerous retaining wall collapses and problems with the roads quality hydrogeology becomes relevant in our days. To avoid possible damage of all engineering structures, it is necessary to carry out investigations, take samples of the soil and concrete, and to explore the movement of water. It is necessary to avoid accidents, which have increased in recent years in the city of Krasnoyarsk.

We conducted a research of testing the concrete, aggressive soils and identified ways to protect against corrosion.

Aggressiveness of soil is a negative chemical, biotic and physicochemical effect of soil for construction materials of engineering structures, which lead to their destruction.

Aggressiveness moist soil is primarily dependent upon the composition and concentration of soluble salts therein. When this is the aggressive pore solution, and the destruction of structures proceeds via a mechanism of their destruction processes in the liquid. From the geotechnical point of view, the most important are two types of aggressive solutions: in relation to the concrete (cement stone) and with respect to metals.

There are the following types of aggressive solutions:

- low-corrosive (failure in a year to 5mm)
- moderately aggressive (in the destruction of up to 10 mm per year)
- strongly aggressive (destruction in the year up to 20mm)

This classification allows highlight the most dangerous areas for life, knowing the degree of aggressiveness of the soil, we need to create certain conditions to protect the structure.

Most designs are constructed with use of concrete. Concrete has a complex composition: 1) clinker and limestone 2) cement, water and other impurities. In the combination of these two components we get artificial stone, the concrete as a building material.

Studies have shown that hard water, the groundwater below the melt from above, is aggressive to any type of cement. Watching the retaining wall on the Svobodny Street in Krasnoyarsk, we have noticed a gradual deviation of the wall due to the influence of water on the concrete. Freezing the water expands in volume of nearly 10 percent, and by the wedge effect. Weather conditions of the region contribute to the destruction. First, in the cement there appear tiny failures, they gradually wedge, and if you do not take the water out, providing a reliable drainage, structural collapse is inevitable. To avoid such impacts, it is necessary to monitor these facilities. And that is what the students of O.J. Perfilova do. They photographed one and the same place once in three months to watch the process over time. Only examining the essence of the corrosion process, you can begin to explore and develop methods of protection. Corrosion is everywhere, where hard parts and constructions are processed and operated. It is necessary to prevent corrosion! It is better to prevent than to eliminate! Moreover, for each particular case there is one particular way of dealing with the process of corrosion. I believe that in our area it is safer to align the ground to the angle of repose. It is one of the best ways of landscape design to arrange lawn and planting trees.