

UDK 691.3

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CREATING CONCRETE RETAINING WALLS EFFECTIVE TECHNOLOGIES FOR DIFFERENT APPLICATIONS

Retaining walls are multifunctional landscape elements that not only perform the technical function of keeping soil from collapsing on the slopes of embankments and excavations, but also allow you to organize space on rough terrain, allowing you to create various levels and zones. One of the most common types of retaining walls in terms of their operating principle is gravity, which can be massive, thin-walled, and soil-filled [1]. Concrete is one of the main materials for the construction of retaining walls due to its strength, durability, and versatility, which allows you to create both massive monolithic structures and lightweight thin-walled prefabricated factory-made elements and thus select the optimal solution for each specific project, taking into account geological conditions, loads, and aesthetic requirements. Modern technologies allow creating concrete products with clearly defined characteristics, which ensures their long service life and a sufficient level of reliability [2]. The technology of monolithic concreting is effective in the construction of massive retaining walls using self-compacting concrete mixtures (SCC) of grades C25/30 SF2 F200 W8, which ensure guaranteed concrete strength indicators even in the early stages of hardening, and sufficiently high frost and salt resistance of the structure. The effectiveness of this technology is associated with a reduction in energy costs for laying and caring for concrete, as well as a reduction in material and labor intensity. It should be noted that the cost of such a concrete mix increases due to the use of new generation superplasticizers and stabilizers, but this is offset by the durability and reliability of the structure.

Fundamentally different is the technology of creating gabion retaining wall structures, which can be attributed to the group of soil-filled, characterized by the absence of strength requirements. This is a spatial structure made of metal or polymer mesh (or geotextile), which can be filled with recycled concrete aggregate, which must be resistant to moisture and weathering [1]. By functional criteria, gabions are divided into fortification (mobile and permanent defense systems) mainly using geotextiles filled with unfractionated concrete rubble containing small fractions, and engineering (for regulatory and coastal protection structures), the filler in which should be stones 1.3 times larger than the size of the metal mesh cell. This involves not only crushing concrete rubble, but also its fractionation, which causes some increase in the cost of the structure. The advantage of a gabion retaining wall is its flexibility and ability to filter water, which allows you to reduce hydrostatic pressure and consolidate the soil. Such structures do not require a special foundation and can be built at any time of the year without the use of specialized equipment. Given the current situation in Ukraine, when the volume of concrete rubble among the products of the destruction of buildings and structures is about 50%, such retaining walls are particularly relevant.

References

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