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USE OF AERATED CONCRETE FOR ROAD CONSTRUCTION

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Abstract

Given the increasing requirements for the quality of road construction works and the positive experience of European countries, the use of autoclaved aerated concrete can bring significant economic effect during the construction of modern roads in Ukraine and change the emphasis in approaches to technology of construction and installation of road construction in general.

Keywords: *cellular concrete, highways, industrial waste.*

Introduction

In the conditions of constantly growing transport load, increase of intensity and speed of movement on highways expenses for capital and current repairs of highways for safety of traffic on them increase. If we compare the durability of road clothing on domestic and foreign transport infrastructure, in Ukraine there is a 1.5-2.0 times shorter service life under almost identical climatic conditions [1-2]. In addition, the norms of calculation and quality of road clothing in Ukraine and the world and the European Union have some differences. The types and properties of road construction materials used in the construction and design of highways also differ.

The main part

One of the ways to reduce the cost of operation and maintenance costs of road transport infrastructure is the introduction into design and construction practice of new design solutions for pavement, which would ensure high quality pavement during the regulatory operating period [3-5]. This can be achieved by introducing into the design of pavement as an antifreeze layer of effective thermal insulation material in order to eliminate the effect of frost removal of the road surface of non-rigid roads.

Aerated concrete is a universal and effective thermal insulation material, which is widely and long used in civil and industrial construction in Ukraine and abroad. The installation of a thermal insulation layer of non-autoclaved aerated concrete allows to completely or partially prevent freezing or overheating of the base of the pavement, reduce the impact of periodic temperature fluctuations of the environment, which increases the durability of the road surface.

Methods of calculating the parameters of the effective thermal insulation layer of pavement, which would take into account the actual thermal conductivity of all layers of pavement and eliminate the effect of frost removal of the road surface, in the practice of design and construction of roads in Ukraine are currently missing. In this regard, the problem of developing aerated concrete with high performance properties as an effective thermal insulation layer for the design of durable multilayer pavement structures is practically significant and relevant

Research and application of various thermal insulation materials for use in road construction began in the middle of the XX century, as the problem of reducing the freezing of the road surface was important for the operation of roads around the world.

Domestic and foreign experience in road construction shows the high efficiency of modern thermal insulation materials in the construction of pavement. In recent years, Ukraine has become increasingly interested in the use of non-autoclaved aerated concrete not only in the construction of residential and public buildings, but also for use in road construction as the latest and most effective thermal insulation material for pavement. In pavement constructions, autoclaved foam concrete can perform two functions at once: a heat-insulating layer and an element that creates conditions for load distribution in the road pavement array.

VNTU has been conducting research on the development of energy-efficient cellular concrete for the last 20 years. The authors in their works [6-10] confirmed the possibility of obtaining cellular non-autoclaved concrete with specified characteristics using man-made industrial waste. The technology of production of cellular concrete with the use of a new non-burning binder has been developed. The compressive strength of the samples is 2.5-2.8 MPa, at a density of 850-1000 kg / m3.

Conclusions

Analyzing the state and prospects of development of transport infrastructure of Ukraine, the unsatisfactory transport and operational condition of highways, low traffic safety on them. One of the methods to improve the quality and durability of non-rigid roads, which account for a significant share of roads in Ukraine, extend the service life of their repair, and construction of modern roads is to eliminate the effect of frost removal by using insulation layer using innovative materials.

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