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Interaction extent of the planar geotextile reinforcement subgrade of roads and rail routes

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Abstract

Horizontal means of reinforcement layers of soil substrates installed in roads and rail routes also the interaction of geotextiles reinforcement of the soil are the subject of discussion in this article. The effectiveness of friction is the main factor in the efficiency the immobilized planar reinforcement by vertical uniform load utility. Mechanism of occurrence of friction as the forces of adhesion reinforcement geotextile with the ground is apparent from the balance of forces and appointed experimental testing as well.

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Keywords: subgrade reinforced;, geotextiles; interface friction

1. Introduction

The horizontal arrangement of layers of geotextiles in the soil loaded with only vertical and static pressure is evenly distributed reinforcement planar case. It is strengthening and subgrade reinforcement of ground layers of the substrate surfaces of roads or surfaces ground earthworks. Load external layer in the substrate are the vertical forces load utility vehicle and the weight of the structure of the surface pavement. This method of reinforcement should be distinguished from the arms subject to direct shearing. In strengthening embankments of earth structures or ground

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water retaining structures. Geotextiles are produced as (fabric weave) fabric material of synthetic porous surface and cleats invoices. This is a separate group of products from the group of geosynthetics characterized by simple production technology and the weight of $1m^2$ as 200 to 400g (*short* gtx). Geotextiles to be distinguished from various types of genets and geogrids which are adapted for the reinforcement layers aggregates. In terms of technology, so that the reinforcement layers of the ground corresponds to the limit the possibilities of improving soil hydraulic binders. It can be used in both the substrate surface rail and automotive substrates surface of rigid and semi-rigid.

2. Nature of the loads reinforced ground layer base conditions

All structural layers substrate conditions are different deformations under service loads of geotextiles. Deformation consisting of a uniform and simultaneous settling do not cause adverse effects in the design of surface conditions of roads. It also includes micro deformation and slight shifts in horizontal planes of geotextiles. They are a source of friction mobilization and reinforce the interaction of soil-material of geotextiles. Deformation appearing residually in the form of small folds on the surface of geotextiles arranged in a layer of soil usually did not exceed 2cm of geotextiles. Static and overall system load uniformly distributed substitute $q = \gamma H$ and micro deformation of geotextiles planes shows diagram of Fig. 1.

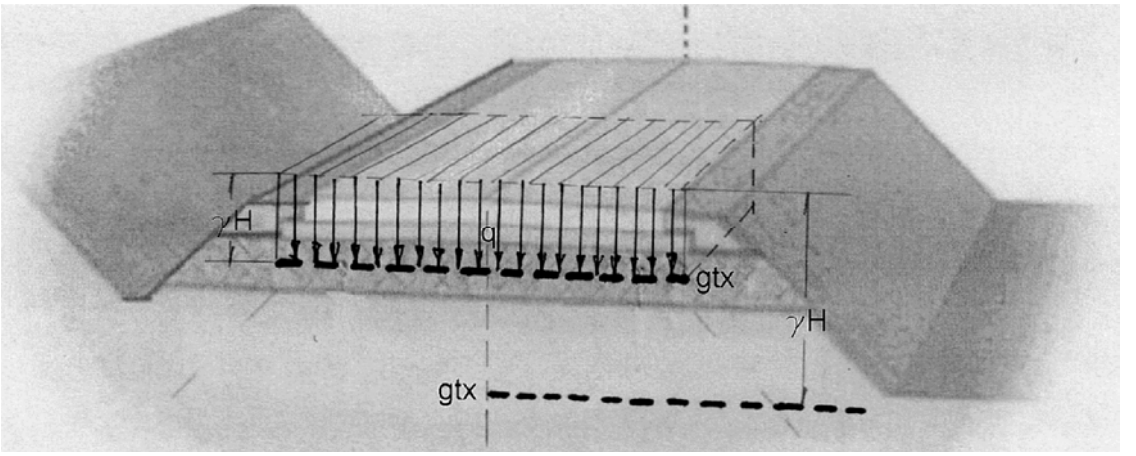

Fig.1. General scheme of loading reinforced layer of the ground substrate of roads

The basic assumption the planned of stability ground layer with geotextiles installed in a layer of soil are given in [1]. e. g

$$R_d = \frac{R_k}{\eta_m} \tag{1}$$

Where;
Rd – design resistance of the geotextile reinforcement,
Rk – short term tensile strength of the geotextile,
ηm – partial safety factor for the structural resistance of flexible reinforced elements.

3. Certain justification range of geotextiles interaction into ground

Given the tangential alignment of forces and load the extracted element reinforcement geotextile, see Fig.2. One can also assume schematically according to [1, 2], the equilibrium is maintained due to the horizontal force of friction in the ground reinforcement geotextile.