

*Short Reports***MATHEMATICAL MODELING  
OF SOIL BASES**

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Reliability is an important factor design to consider the variability associated with the design inputs. Parameters such as mean, maximum likelihood, median, coefficient of variation, and density distribution function of subgrade strength are determined [1]. The approach is based on an extensive literature review of current damage concepts included in current mechanistic-based design procedures, soil permanent deformation laboratory data. The physical properties of subgrades structures significantly influence both the response of the subgrades to applied loads and the long-term performance. It is, therefore, of the utmost importance that full scale test subgrades be constructed with uniformity in material properties, layer thicknesses, and other considerations for which non-uniformity might result in nonrepresentative and nontypical behavior and failures. Current mechanistic-based design methods for the design of subgrades use vertical strain criteria to consider foundation rutting.

A considerable number of measurements of the physical properties test pavements were made at all stages of construction and after construction was completed. The measurements were made for three purposes: construction quality control, construction

acceptance, and material characterization. The material characterization tests were performed to provide information for theoretical modeling and were not related to construction and contractual requirements. For a basis of model building we take the model of elastic foundation, Vlasov owl Leont'ev [1]. The choice of the appropriate type of foundation is governed by some important factors such as: the nature of the structure; the loads exerted by the structure; the subsoil characteristics; the allotted cost of foundations. Therefore to decide about the type of foundation, subsoil exploration must be carried out. Then the soil characteristics within the affected zone below the building should be carefully evaluated. The allowable bearing capacity of the affected soil strata should then be estimated. Theory of elasticity analysis indicates that the stress distribution beneath footings, symmetrically loaded, is not uniform. The actual stress distribution depends on the type of material beneath the footing and the rigidity of the footing. For footings on loose cohesion-less material, the soil grains tend to displace laterally at the edges from under the load, whereas in the center the soil is relatively confined. This results in a pressure diagram somewhat as indicated in [2].

**References**

1. Petrov V.V. Dimensional model of nonlinear deformable heterogeneous base // Interuniversity scientific collection. – Saratov: SSTU, 2007. – P. 6–12.
2. Artamonova E.N. On the design of slabs on the basis of a non-uniform. – M.: INGN, 2012. – P. 4.