

Evaluation of Characteristic Soil Properties for Mixed-grained and Organic Soils as a Base for Building Standards

Using statistical methods an attempt was made to develop from an existing data base relations which, based on the results of simple soil tests, enable the assessment of characteristic values for shear parameters of mixed-grained soils. Up to now the very few data published in reference works are related to the consistency limits which are of little evidence for these soils.

Tests on samples of glacial loam and marl from the Berlin area with fine grain contents ($d \leq 0,06$ mm) between 15 % and 60 % were evaluated. Relations of friction angle and cohesion of these soils to the void ratio and the fine grain content were established. As ϕ and c showed too much dispersion to be used in a statistical analysis, the much less dispersive principal stress ratio σ_1/σ_3 during failure of the individual tests was employed. Additionally, relations of the uniaxial compressive strength q_u to the void ratio, the water content and the fine grain content were evaluated.

Based on 1300 test results a simple model for the assessment of characteristic values of ϕ and c related to the void ratio e was developed for practical application, which agrees well with published data for the most frequent void ratios ($e = 0,3$ to $e = 0,45$). For the uniaxial compressive strength a statistical relation to fine grain content and the water content was found. Because of too few samples a similar relation could not be established for the undrained cohesion c_u .

An additionally conducted evaluation of the shear parameters ϕ , c , c_u and q_u of organic soils (peat, sapropel and calcareous organic silt) did not yield usable results due to wide diversions and too small ranges of samples.