Geophysical Research Abstracts, Vol. 7, 08470, 2005 SRef-ID: 1607-7962/gra/EGU05-A-08470 © European Geosciences Union 2005



Relationships Between Electrical Properties (in Situ) and Water Content (in The Laboratory) of Some Soils in Turkey

Ferhat Ozcep (1) Metin Asci (2) Okan Tezel (1) Turker Yas(2) Nuray Alpaslan(3) Devrim Gundogdu(4)

- 1. Istanbul University, Faculty of Engineering, Department of Geophysical Engineering, Avcilar, Istanbul, Turkey, E mail: ferozcep@istanbul.edu.tr
- 2. Kocaeli Faculty of Engineering, Department of Geophysical Engineering, Izmit, Turkey.
- 3. Doruk Engineering, Istanbul..

In this study, our analysis is conducted to set the relationships between soil electrical resistivity and water content. Soil is a heterogeneous medium consisted of liquid, solid and gaseous phases. The solid and liquid phases play an essential role in soil spontaneous electrical phenomena and in behavior of electrical fields artificially created in soil. Soil electrical properties are the parameters of natural and artificially created electrical fields in soils and influenced by distribution of mobile electrical charges mostly inorganic ions, in soils. Geophysical methods of vertical electrical sounding were used for measuring soil electrical properties and tested in different soil studies. For our aim, study area is selected in Istanbul, Izmit, Gölcük. In this area, it is measured the electrical resistivity by VES (Vertical Electrical Sounding) in many points of this location. For geotechnical purposes, on the soil samples from borings, it was applied soil mechanics laboratory procedures and is determined the soil water contents from these samples. Relationships between soil water content and electrical parameters were obtained by curvilinear models. For this range, it is found the relation between resistivity (R) and water

content (W) of soils as

W =52 $e^{-0.09}$ (for Istanbul data) **W** =48 $e^{-0.016}$ (for Golcuk data) **W** =49 $e^{-0.02}$ (for Izmit data) **W** =50 $e^{-0.02}$ (for all data)