Abstract

Nairobi City is located in an area that may have been part of a large lake or a series of lakes that extended from Ol Doinyo Sabuk to almost Kajiado in the Tertiary Period. Volcanic rocks deposited in these lakes vary in lateral and vertical extent and in strength. Geotechnical investigation of sites with high variability by use of boreholes can be very costly. Electrical resistivity surveys are cheaper and quicker. The investigation program in this study involve d 1-D geophysical resistivity surveys carried out at 48 sites with electrode distances ranging between 80 m and 500 m. The focus of the study was on how site investigations can be carried out cheaply and quickly in the context of design of heavy buildings and in underground excavations in Nairobi City. Results for the resistivity survey are presented as log-log curves for the various sounding sites alongside the borehole logs while fractures traced in the borehole logs are indicated on a map. The results of this study indicate that the Nairobi subsurface consists of five different profiles with strata having resistivity values in the range of 4.3 Ohm-m to 480 Ohm-m. In spite of the similarity of the curves, the number of layers detected in each profile is variable. In areas dominated by clays or alternating layers of weak and strong materials, the resistivity values are less than 100 Ohm-m. Electrical geophysical resistivity can be used to determine stratigraphic information at a site to pinpoint spots for geotechnical investigation in order to detect any variation that can pose challenges in building structures that can stand the test of time.