



Selected geotechnical properties related to clay minerals of rocks of the Eocene Thebes Formation, Egypt.

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The new urban city of 15th May is located in the Greater Cairo area. Most of the buildings were constructed during the last two decades. Some houses are found to be cracked and severely damaged during the last 10 years. The reasons behind this structural damage are not known yet. As an attempt to investigate this problem, selected geotechnical studies were initiated. Water-intake tests have been carried out to determine quantitatively the clay mineral content. The results show that the maximum water absorption in the tested samples is 136 %, which is a very high, almost unknown value. X-ray diffraction (XRD) has been applied to the rock samples and the results show that the rock samples contain 72 to 77 % of smectite potentially swelling clay mineral, 0 to 23 % of kaolinite, 0 to 24 % of chlorite, 0 to 4 % of illite, gypsum, calcite and minor amounts of quartz. Based on the interpretations of the acquired data, the major factors leading to building damages are anticipated to be the clay content, gypsum and halite. Existence of groundwater is a good environment for clay, gypsum and halite to react leading to physical and chemical weathering and, therefore, geotechnical weathering of the limestone bedrock.