



The swelling potential of clays from the Bahlui river plain, in relation to their mineralogy

Florentina Pascariu¹ and Andrei Panțir¹

¹ “Alexandru Ioan Cuza” University of Iași, Department of Geology, 20A Carol I Blv, 700505 Iași, Romania

Abstract

The present paper highlights the specific swelling of several clay samples collected from different areas of the city of Iași (the Bahlui river plain, in particular), through dedicated geotechnical determinations and mineralogical analyses.

The results obtained within this research have emphasized the following aspects:

- the rocks analyzed exhibit swelling potentials ranging from reduced to high and even very high; the clays with very high swelling potentials were located in Miocene deposits and collected from depths of 19 meters and 34 meters, respectively.

- from a mineralogical point of view, the clay rocks studied display a similar qualitative aspect; however, quantitatively, there is a certain disparity between the samples. The sediments from depths of more than 10 meters contain 25-35% smectite (phyllosilicate mineral group with swelling properties), while the Miocene rocks, which are older, exhibit lower values, of 22-25%. Exceptionally, there are two soils that have a smectite content exceeding 30% (the same rocks harvested from depths of 19 m and 34 m, respectively).

The present research has finally proven the fact that swelling properties can be correlated with aspects regarding smectite content, in other words, samples with more consistent swellings have a high content of minerals from this mineralogical group. However, the existence of those clay rocks with high swelling potential in a deposit where rocks are predominantly considered less dangerous (geotechnical specialists regard them as the bedrock of the research area), may be a subject that needs to be carefully addressed in a future study.

Keywords: swelling potential, bedrock, shallow deposits, mineralogical analysis.
