



“Gheorghe Asachi” Technical University of Iasi, Romania



STUDY ON THE USE OF GEOTEXTILES FOR ENSURING DRAINAGE CONDITIONS WITHIN INDUSTRIAL FLY ASH PONDS

Lidia Niculiță, Raluca Ioana Chirică*

Technical University of Civil Engineering, Bucharest 020396, Romania

Abstract

Fly ash ponds are dangerous for the environment because the fly ash can cause multiple harmful effects. This is cause for major concern for researchers and industry people alike. The rise of the water table level inside the ash structure may cause a loss of stability over time, with adverse effects on the environment. Therefore it is necessary to adopt efficient solutions to ensure the stability of ash ponds and rapid measures that can be applied. The use of geosynthetic materials has proven to be one of the best and fastest methods for stabilizing an ash structure.

In order to ensure maximum environmental protection when using geosynthetics within ash ponds, compatibility testing for the fly ash-geotextile system was conducted, by using two different experimental methods: the gradient ratio testing for measuring the clogging potential and the permeability testing in the triaxial installation. A comparative study was performed between the two methods described and the advantages of each one were emphasized.

For assessing the stability conditions, a range of shear strength parameters values of fly ash was determined by using the direct shear and torsional shear tests results. Finally, a numerical modeling of the situations without and with geotextile layers inserted within the fly ash pond was performed by using applications of the Geostudio software program. The advantages of including geotextiles in the fly ash structure were highlighted, in terms of factor of safety.

Keywords: compatibility, drainage, fly ash, geotextile, stability

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* Author to whom all correspondence should be addressed: e-mail: niculita@gmail.com, chirica.raluca@gmail.com; Phone: +40/722594890