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SAFETY LEVELS REACHED BY REINFORCED SOIL STRUCTURES

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Abstract

The paper deals with reinforced soil structures used in critical infrastructures for ecological landfills. During the last 17 years in Romania 28 such landfills were completed. Romania is however a country where strong earthquakes often occur. About 60% of its territory feels the seismic actions which combine with the existing ones. During earthquakes in the massive structures of landfills, huge inertial forces are developing. Due to uncontrolled movements and deformations, the protective layers of isolation could yield, producing ecological disasters of unforeseen proportions and consequences. Since prevention measures are preferable as opposed to those of repairment, the paper presents a comparative analysis between the safety levels reached in four compatible scenarios of loading. For this purpose three phenomena of instability are considered: lateral sliding, overturning and settlement. These three phenomena correspond to the degrees of freedom by which typical cross sections are endowed.

The numerical analysis was carried out with the *WinWall Program* under Tensar license whilst the results were displayed analytically, in tables, and graphically, in axonometric views. By this study, those parameters allowing physical or structural interventions for enhancing the level of safety were identified. The study is also of high interest for the cost evaluations of the reinforced soil structures currently used in critical infrastructures.

Key words: aspect-ratio, critical infrastructure, durability, seismic hazard

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