



Slope stability assessment of weathered clay by using field data and computer modelling: a case study from Budapest

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Oligocene clay covers large area of valuable lands in the city of Budapest. The clay formation was previously used for brick production and parts of the abandoned brickyards were recultivated by heterogeneous landfills. Due to urbanisation the area of previous brickyards is partly built-in and is under development. Slope instability and risk of landslides are important issues and have a significant influence on the preservation of houses and engineering structures in these areas. The slope stability analyses were performed based on borehole data and laboratory analyses by using two geotechnical software, Plaxis and Geo4.

The clay is divided into two different geotechnical units. The lower layers consist of grey impermeable clays while the upper unit is characterised by yellowish weathered clay having a limited permeability. At some localities loess and debris cover the topmost weathered clay layers. The main trigger mechanism of landslides is related to rainwater infiltration. The precipitation seeps into the upper clay layer via debris down to the boundary zone of yellow weathered and grey unaltered clay. Furthermore water is driven to the boundary zone from local springs that were covered by former landslides further decreasing the friction.

The slope stability and safety factor was analysed for selected sections by using a finite element software (Plaxis) and another software that uses conventional methods, circle and polygonal slip surfaces (Geo4). The results of the two software-based stability assessment approaches are compared. According to these analyses there are clay-covered areas where the slope stability factor is less than acceptable and thus it

is necessary to limit construction activities and regularly monitor these slopes.