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Summary of the doctoral dissertation

ANALYSIS OF LOCATION OF LANDSLIDE SLIP SURFACE ON THE BASIS OF PORE WATER PRESSURE CHANGES UNDER GEOLOGICAL AND ENGINEERING CONDITIONS OF THE CARPATIAN FLYSCH

Abstract

The possibly precise determination of the location of the landslide slip surface is of fundamental importance for the design of its protection. In practice, various types of field tests and calculations based on determined parameters from field and laboratory tests are performed to locate the slip surface. It should be emphasized, that direct identification of the slip surface using field methods, which include pore pressure sounding, is of key importance.

The aim of the doctoral dissertation is to analyze the location of the landslide slip surface on the basis of anomalous changes in water pore pressure in the geological and engineering conditions of the Carpathian flysch. To achieve this goal, the author developed his own research methodology that enabled testing of anomalous changes in pore pressure with the help of the CPTU probe. This methodology takes into account the method of identification of zones of anomalous pore pressure changes on the basis of the proposed relative pore pressure index u_2^R and verification of their location by measuring inclinometric displacement and numerical analysis of landslide behavior in the study area. It was assumed that the anomalous zones of pore pressure changes are weak zones, which may be landslide slip surfaces.

In the scope of the research, ten CPTU soundings were carried out with the measurement of pore water pressure on two landslides: in Tęgoborze Just and Siercza created in the Carpathian Flysch formations. The tests were carried out under various water conditions related to the different occurrence of atmospheric precipitation. CPTU soundings were made in the depth range from 3.52 to 8.5 m. As part of the methodology adopted, the author confirmed the location of the indicated anomalous zones of pore pressure changes by the results of numerical analysis of landslide behavior, inclinometer measurements, as well as other observations indicating movements landslides in the study area. CPTU soundings in a specific research area were preceded by making a test hole to check the structure and properties of the geological medium and to collect samples to determine the input parameters for the numerical analysis of landslide stability.

The results of CPTU soundings with pore pressure measurement confirm their practical importance and indicate their usefulness as an additional tool in assessing landslide activity.