Abstract

The thesis deals with an application of the geotechnical numerical back analysis and several other geotechnical conventional techniques in estimating the thickness of eroded sediments. Investigated strata is the Lower Miocene marine clay, often called „Tegl" which was deposited in the Carpathian Foredeep in the eastern part of the Czech rep.

Numerical back analysis is based on an assumption that erosion thickness of a soil can be derived from its stress sate represented by K_0 coefficient (coefficient of earth pressure at rest).

The erosion thickness given by the numerical back analysis is compared with two estimations using Baldwin–Butler's equation and Casagrande´s concept of preconsolidation stress. The erosion thickness is also derived from K_0 values given by two field probes: Flat dilatometer (DMT) and Push-in spade shaped pressure cell (PSPC).

The numerical back analysis was applied to galleries and adits opened during site investigation of the Královo Pole Tunnels in Brno. Both the samples for laboratory analyses were taken and the field tests were carried out in area of Brno city.

Discrepancy of the results is analyzed and the conclusion is that the results given by the four conventional mentioned techniques (Baldwin-Butler, Casagrande, DMT, PSPC) are strongly distorted if the investigated soil is affected by "ageing" effects, (diagenesis, secondary compression etc.) such as Tegl strata is. The application of Baldwin–Butler's equation suggested the erosion thickness of 180 – 270 m, Casagrande´s technique of 100 – 800 m, field measurements of ca. 40 – 1000 m while the numerical back analysis of 0 – 40 m. The results given by the geotechnical numerical back analysis seems to be most relevant and the most probable value of the erosion thickness of the Tegl strata is 30 – 40 m. The inaccuracy of this estimation is probably in a range of several tens of meters.