Abstract

Two types of conventional methods are used for slope stability analysis in practise. The first type are analytical methods based on limit equilibrium (e.g. methods by Petterson, Bishop, Spencer etc.) The second type are a numerical methods based on finite elements analysis. From this sort the most frequently used is the ϕ-c reduction method.

One of disadvantages of these methods is that analyzed geotechnical problem must be discretised into quasi-homogeneous parts that are characterized by constant value of mechanical properties. Detailed studies, for example El-Ramly et al. (2006), show that mechanical characteristics from one quasi-homogeneous part often have natural variability. This can be described with some type of statistical distribution.

This observation is taken into account in random finite element method (for example Griffiths and Fenton (2004)). To study this method, program *random field* (Mašín 2006) was created. The program is able to generate random fields from parameters of statistical distribution of mechanical properties and map them onto finite element mesh. Next input parameter for creating the fields is correlation length that characterises dependency of random variables on their distance in space. These random fields are used as input mechanical characteristic for the next step which is the finite element analysis.

Subject of this diploma thesis was testing of function of the *random field* program in parametric study on the idealized slope stability problem. Subsequently, probability of failure of the real slide in Lodalen (Norway) from the year 1954 was computed. Mechanical parameters of clay, ground water condition and slope geometry were assumed from the original paper by Sevaldson (1956).