

## **ROCK SLOPE DESIGN USING EXPERT SYSTEM : ROSES PROGRAM**

Kittitep Fuenkajorn and Santhat Kamutchat

Geological Engineering Program, School of Geotechnology  
Institute of Engineering, Suranaree University of Technology

### **Abstract**

A computerized expert system (called ROSES) has been developed to assist in the stability evaluation and support design of rock slopes. The system shell uses Visual Prolog to make it user-friendly, interactive and revisable. The system is designed for man-made and natural rock slopes under a variety of geological conditions and engineering requirements. The inference engine employs forward chaining strategy by collecting data, categorizing the slope to fit the preset conditions, evaluating the stability, and seeking the most appropriate design recommendation. The main input data include the general geological features, slope applications, water conditions, slope geometry, rock types, discontinuity characteristics, engineering constraints, geomechanics parameters, degrees of weathering, and vegetation. The considered modes of failure are plane sliding, wedge failure, toppling, and circular failure. The system has been subjected to tests using real mining situations and comparing with textbook solutions. The results are encouraging.