

SESSION 16: ROCK SLOPE STABILITY

Papers:

A CLASSIFICATION OF WEATHERED FOLIATED ROCKS FOR USE IN SLOPE STABILITY PROBLEMS
R.T. Sancio and I.R. Brown; vol 2, 81-86

THE DETERIORATION OF A DOLERITE ESCARPMENT
P.C. Stevenson; vol 2, 87-91

DETERMINATION OF MASS MODULI FOR SLOPE DESIGN
B.A. Chappell and R. Maurice; vol 2, 93-100

FINITE ELEMENT ANALYSIS OF A SLOPE AT ILLAWARRA ESCARPMENT
S. Valliapan and R.S. Evans; vol 2, 241-246

Paper by R.T. Sancio and I.R. Brown

Mr J. Read asked what were standard drilling techniques referred to in the paper and did the authors seriously consider that abbreviations such as xRSx and xRXs were practicable or represented a forward step in classification systems. To the former, Dr Sancio explained that diamond and split spoon type drilling methods were used as standard drilling techniques and to the latter he replied that such a classification could be useful to an engineer to assign values to different regions of a slope and/or it could also help to determine a mean value for the slope in terms of its engineering behaviour.

Prof B. Ladanyi commented that back calculations produce conservative values of the shear strength parameters. Mr A.H. Sewell agreed with Prof Ladanyi that, if one performed the back analysis of the stability of the slope using the slip surface resulting from the final stage of the failure, low values of shear strength parameters would usually result. These values were probably related to the so-called residual strength parameters. However, if the back analysis was performed along the first slip surface, the one which sometimes triggered a compound slide, then the shear strength parameters were the peak ones. This had been found by comparing these results with field and laboratory tests.

Paper by B.A. Chappell and R. Maurice

Prof Ladanyi commented that it was very important to measure rock behaviour in situ as was done in this case.

Dr M.J. Pender pointed out that scale effects bedevil the interpretation of tests on jointed rock masses, whether the test was to measure rock mass, strength, or stiffness. In referring to Fig.2 he suggested that the size of the plate in the diagram might not represent the scale of the joint system and asked if a larger plate might be required to get a measure of the rock mass stiffness. Dr Chappell, in reply, said that much larger plates were used and that field results were compared with computer calculations in which the actual joint system was modelled. Also, since a full core recovery was achieved, a model of the rock characteristics could be obtained from various tests.

Mr J. Read questioned the relevance of the work as he understood that the movement actually recorded in the slope described related to block movement on a base plane formed by a fault which daylighted somewhere near the toe of the slope, and hence that the work had been based on an incorrect model.

In reply, Dr Chappell stated that the slope had failed in five separate areas in various ways and that by putting in rock bolts the moduli had been altered and deformation had been reduced to an acceptable limit, so that his model had proved to be fairly accurate.

Finally, Dr B.N. Whittaker pointed out that a number of rock mechanics investigators in different countries had produced tentative linear relationships between uniaxial compressive strength and Young's Modulus. Since it was well established that increasing the size of the specimen under test decreased the uniaxial compressive strength (up to a given limit depending on rock type) he asked whether the same principle applied to Young's Modulus being changed as strength was changed for the same rock type. Dr Chappell replied that this might be valid in certain cases, but was certainly not valid in this case. Where joints were orthogonal to the loading system a modulus relationship was obtained between the strength reduction ratios.