41
COULSON,JH TENNESSEE VALL.AUTHOR.KNOXVILLE,USA
Shear strength of flat surfaces in rock. Symposium. In Stability of rock slopes. 7F,4T,35R.
13TH SYMPOSIUM ON ROCK MECHANICS ASCE,NEW YORK, 1972,P77-105.
The basic shear strength values for smooth, flat surfaces in rock, to which the geometrical component of shear strength, as defined by field mapping or core studies, can be added to obtain the shear strength along natural joints are defined. Tests were performed on flat rock surfaces prepared in the laboratory, on 10 rock types with varying roughnesses. These types and the testing apparatus are described. It is concluded from data given that: 1. Surface roughness for a given surface preparation is a function of strength and porosity; 2. Four processes of surface damage were observed, polishing, gouging, rock-flour generation and indurated crust generation; 3. Shear strength tests on rock surfaces should be performed with direct shear apparatus in order that the displacements required to obtain residual shear strength can be accomodated; 4. Surfaces should be tested in the same range of normal pressures as imposed upon field joints; and 5. Tests should be performed under moisture conditions approximating those of the field situation.

42
HAMEL,JV SOUTH DAKOTA SCH.MINES AND TECHNOL.USA
The slide at Brilliant cut. Symposium. In Stability of rock slopes. 9F,2T,15R.
13TH SYMPOSIUM ON ROCK MECHANICS ASCE,NEW YORK, 1972,P487-510.
In 1941 a failure of the side of Brilliant cut occurred. This slide is described in detail and analyzed as a large scale natural shear test. The set of effective stress Mohr-Coulomb shear strength parameters required in the basal formations for limiting equilibrium of the failure mass was calculated with the Morgenstern-Price method of stability analysis. These strength parameters are compared with those measured by various investigations for indurated clays and clay shales similar to those in the basal formations at Brilliant. The roles of peak and residual shear strengths in the Brilliant slide are also discussed.

43
HUDSON,JA UNIV.MINNESOTA,MINNEAPOLIS,USA
BROWN,ET JAMES COOK UNIV.QUEENSLAND,AUS
FAIRHURST,C UNIV.MINNESOTA,MINNEAPOLIS,USA
Shape of the complete stress-strain curve for rock. Symposium. In Stability of rock slopes. 8F,2T,14R.
13TH SYMPOSIUM ON ROCK MECHANICS ASCE,NEW YORK, 1972,P773-795.
Experimental data are presented and the variability in the shape of the complete stress-strain curve for rock with particular emphasis on the influence of specimen geometry is discussed. The following conclusions were reached directly from the experimental data: 1. The initial elastic modulus did not vary with specimen geometry; 2. There was no significant variation in the compressive strength with specimen size; 3. A definite variation in compressive strength with specimen shape was observed; 4. For all L:D ratios, larger specimens were associated with a steeper slope in the post-peak portion of the complete stress-strain curve; 5. For all diameters, longer specimens were associated with a steeper slope in the post-peak portion of the complete stress-strain curve; and 6. The size of the small axial cracks that developed during compressive failure was related to the microstructure and not the specimen size.

44
CORNET,FH UNIV.MINNESOTA,MINNEAPOLIS,USA
Pore fluid and the mechanical behaviour of rock. Symposium. In Stability of rock slopes. 3F,2OR.
13TH SYMPOSIUM ON ROCK MECHANICS ASCE,NEW YORK, 1972,P825-844.
Pore fluid influences the behaviour of rock subjected to a triaxial state of stress. The fluid has a direct action on the matrix of the rock: the unit surface energy value and coefficient of friction are altered and the matrix can be chemically dissolved. In addition, if the rock is saturated, pore pressure modifies the state of stress and decreases the principal stress values. Theoretical and experimental aspects of the pore fluid effect are discussed and it is suggested that the presence of pore fluid accentuates the brittleness of the rock. The pore pressure could be used as a parameter to represent, qualitatively or quantitatively, the state of failure in a specimen tested in undrained conditions. Auth.

45
HAIMSON,BC UNIV.WISCONSIN,MADISON,USA
KIM,CM UNIV.WISCONSIN,MADISON,USA
Mechanical behaviour of rock under cyclic failure. Symposium. In Stability of rock slopes. 10F,1T,6R.
13TH SYMPOSIUM ON ROCK MECHANICS ASCE,NEW YORK, 1972,P845-863.
The work reported here is the first phase of an extensive investigation into the behaviour of rock under cyclic loading. The main results obtained thus far in cyclic uniaxial compression of White Tennessee Marble are presented. It is recommended that in surface and underground design the apparent fatigue limit be used instead of the commonly employed compressive strength value.

46
BRADY,BT BUR.MINES,DENVER,COLO.USA
DUVALL,WI BUR.MINES,DENVER,COLO.USA
HORINO,FG BUR.MINES,DENVER,COLO.USA
An experimental determination of the true uniaxial stress-strain behaviour of brittle rock.
ROCK MECHANICS,V5,N2,1973,P107-120.
Results are presented of an experimental study of the behaviour of six rock types deformed under uniaxial compression into their respective post-failure regions. Theoretical and experimental techniques are developed which allow an estimate of the true load-bearing area of the rock sample at any point along the post failure curve of the sample. For rock types used in the study, which were deformed to preselected positions along their respective post-failure curves and with the assumption that the fractured rock carried none of the applied load, the two techniques of measuring the effective load-bearing area give results which are equivalent.,

47
LOHNES,RA IOWA STATE UNIV.AMES,IOWA,USA
DEMIREL,T
Strength and structure of laterites and lateritic soils. 11F,7T,24R.
ENGNG.GEOLOGY,V7,N1,1973,P13-33.
Ten soils from Puerto Rico representing various states of weathering were subjected to engineering index tests, strength and density measurement, mineralogic analyses, and scanning electron microscopy. Engineering classification systems used for temperate soils tend to underestimate the engineering behaviour of these undisturbed lateritic soils and in the undisturbed state the soils exhibit low densities and high strengths. The engineering properties of the undisturbed soils show systematic trends in relation to the degree of weathering and the parent rock. For a given rock, the void ratio is decreased and cohesion increased as weathering proceeds. This is the result of increasing crystallization and cementation by the sesquioxides. The specific gravity of the solid particles is a promising index property to characterize these lateritic soils insofar as it reflects iron oxide content. The decrease in void ratio and increase in cohesion with increasing specific gravity suggests a model for the engineering classification of tropical soils. Auth.