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INFORMATION RETRIEVAL

The key words, abstract, and reference "cards" for each article in this Journal represent part of the ASCE participation in the EJC information retrieval plan. The retrieval data are placed herein so that each can be cut out, placed on a 3 x 5 card and given an accession number for the user's file. The accession number is then entered on key word cards so that the user can subsequently match key words to choose the articles he wishes. Details of this program were given in an August, 1962 article in CIVIL ENGINEERING, reprints of which are available on request to ASCE headquarters.

6449 SLOPES IN STIFF-FISSURED CLAYS AND SHALES

KEY WORDS: clays; overconsolidated soils; progressive failures; safety factors; shales; slope stability; soil mechanics; stress analysis

ABSTRACT: Case histories and probable causes of slope failures in stiff-fissured clays and shales are reviewed, and analyses are described which were performed to determine the influence of the initial stress conditions on the stresses around excavated slopes. These analyses show that the shear stresses around excavations are much larger for conditions representative of heavily overconsolidated clays (high initial horizontal stresses) than for conditions representative of normally consolidated clays (low initial stresses). Shear stresses large enough to cause failure at some points may develop even when the factor of safety calculated by the $\phi = 0$ method of analysis is much larger than unity. The higher the horizontal stresses before excavation, the higher the factor of safety corresponding to development of local failure.

REFERENCE: Duncan, James M., and Dunlop, Peter, "Slopes in Stiff-Fissured Clays and Shales," Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 95, No. SM2, Proc. Paper 6449, March, 1969, pp. 467-492.

6450 SOIL MECHANICS AND THEOREMS OF LIMIT ANALYSIS

KEY WORDS: bearing capacities; energy dissipation; plasticity; plastic limits; soil mechanics; truss action

ABSTRACT: An attempt is made to exhibit the plastic limit theorems in terms more familiar to the civil engineer. The interpretation of a continuous velocity region as the limiting case of infinitely many rigid blocks separated by surfaces of discontinuity provide an excellent technique for obtaining energy dissipation needed for upper bound calculations on plastic limit load. Similarly, the intuitive approach of imagining a pin-connected truss to support loads is shown to provide an excellent technique for obtaining lower bounds. Also a graphical procedure is introduced to eliminate much of the tedium associated with the construction of a stress field. The problems of the loaded truncated wedge and the wedge under unilateral pressure are treated as illustrative examples. Then the general strip foundation is solved. Upper and lower bounds are plotted and are seen to be rather close. Friction effects on the bearing capacity of foundations are also discussed.

REFERENCE: Chen, W. F., "Soil Mechanics and Theorems of Limit Analysis," Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 95, No. SM2, Proc. Paper 6450, March, 1969, pp. 493-518.

6452 CONSOLIDATION UNDER CONSTANT RATES OF STRAIN

KEY WORDS: compressibility; consolidation; rapid compaction control; settlement relationship; strain rate; tests

ABSTRACT: Consolidation tests on three materials were conducted by inducing six different constant rates of strain on the samples. The total load on the sample, the pore pressure at the base and the deformation were measured. A theoretical solution was developed to enable the determination of the coefficient of consolidation, the compression index, and the preconsolidation pressure from this testing procedure. Within established limits, it is shown that the consolidation parameters determined by this method agree with parameters determined by the conventional testing method. The advantages of the proposed procedure are that a much shorter time is required to determine the consolidation parameters and that this procedure can be used to study the strain rate sensitivity of cohesive soils to consolidation loads.

REFERENCE: Smith, Ronald E., and Wahls, Harvey E., "Consolidation Under Constant Rates of Strain," Journal of Soil Mechanics and Foundations Division, ASCE, Vol. 95, No. SM2, Proc. Paper 6452, March, 1969, pp. 519-539.