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DISCUSSION

Proc. Paper 7643

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[a] Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

TECHNICAL NOTES

Proc. Paper 7646

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.

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[a] Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

7654 STABILITY OF CELLULAR COFFERDAMS AGAINST SHEAR

KEY WORDS: bulkheads; cellular cofferdams; cofferdams; friction; retaining walls; shear failures; sliding; soil mechanics; stability

ABSTRACT: The concept of failure of cellular cofferdams by sliding along vertical planes (vertical shear) is examined in detail. The Terzaghi and Krynine approaches to evaluating stability against vertical shear lead to conclusions that are shown to be contrary to engineering expectations and philosophically difficult to accept. No reasonable failure mechanism that permits sliding along vertical planes is uncovered in the examination. It is suggested that if a measure of stability against failure by vertical shear is desired then the cellular cofferdam should be assumed to fail in simple shear. Failure by simple shear implies a near-vertical failure surface and a ratio of horizontal to vertical stress of unity. However, it is also suggested that it may be better to ignore vertical shear entirely and to validate, with a view to adopting, design procedures proposed by Hansen.

REFERENCE: Esrig, Melvin I., "Stability of Cellular Cofferdams Against Vertical Shear," Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 96, No. SM6, Proc. Paper 7654, November, 1970, pp. 1853-1862.

7649 MECHANISMS CONTROLLING COMPRESSIBILITY OF CLAYS

KEY WORDS: bentonite; clays; compressibility; consolidation; illite; kaolinite; physico-chemical; smectite; soil mechanics

ABSTRACT: The consolidation characteristics of clays are controlled by mechanical and physico-chemical effects. Although these effects operate simultaneously one-dimensional consolidation tests indicate that one or the other usually dominates. The consolidation characteristics of sands, mica, and kaolinite are mechanically controlled whereas those of smectite are physico-chemically controlled. Illite occupies an intermediate position in that the virgin compression curve seems to be controlled by mechanical variables, whereas the swelling curve is influenced by both effects; the physico-chemical effect is more important when the adsorbed cations are monovalent and the pore water electrolyte concentration is low.

REFERENCE: Olson, Roy E., and Mesri, Gholamreza, "Mechanisms Controlling Compressibility of Clays," Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 96, No. SM6, Proc. Paper 7649, November, 1970, pp. 1863-1878.

7652 SHEAR STRENGTH AND STABILITY OF MAN-MADE SLOPES

KEY WORDS: fills; graphic methods; optimization; safety factors; shear strength; slopes; soil mechanics; stability analysis

ABSTRACT: A new method of graphically expressing slope stability analysis in which equal Factor of Safety contours are drawn for a given slope for all values of angle of internal friction and cohesion intercept of the slope material is presented herein. This greatly facilitates the study of the effect of soil strength variation on the stability of such slopes. Recognizing the variability in the values of shear strength parameters due to testing techniques, moisture content changes and the hetrogenity of the soil, it is shown that the choice of strength parameters overrides the choice of the method of slope stability computation. Procedures are outlined for optimum economical design of a slope and also for bedding plane failure analysis in multilayered system. Stability charts for balanced factor of safety for man-made slope with b horizontal to 1 vertical for b = 0.5, 0.75, 1.0, 1.5, 2.0, 2.5 and 3.0 are included for all practical value of shear strength parameters. The same charts can be used for cases when a relatively higher margin of safety is required in cohesion or in friction.

REFERENCE: Singh, Awtar, "Shear Strength and Stability of Man-Made Slopes," Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 96, No. SM6, Proc. Paper 7652, November, 1970, pp. 1879-1892.