The shear strength relationships are significant, although it is noteworthy that for the four fluids possessing the lowest dielectric constants there is a large range of shear strengths (Figs 6(a) and (b)) especially for the kaolinite. Furthermore the void ratios associated with all four of these fluids at the preconsolidation pressure (Figs 2(a) and 4(a)) are virtually the same. It is clear therefore that some additional factor other than dielectric constant and fabric is influencing shear behaviour.

The suggestion that flocculation takes place, as a result of replacing one pore-fluid with another in a consolidated material having a void ratio 0·9 (Fig. 10), raises questions. Flocculation is a phenomenon normally associated with suspensions in which particles have sufficient freedom of movement to assume different modes of association. It is also, especially in kaolinite, governed by pH, about which nothing is stated. Presumably it is possible to envisage the occurrence of the necessary slight concomitant accommodating movements of interlocked particles in a comparatively dense assemblage, although the evidence provided appears a little slender.

The appearance of curves 2 and 3 (Fig. 10) are so similar to that of Fig. 9 curve 1, when plotted to the same scale, that a further explanation of the material behaviour reflected by these curves seems possible. The microstructure of the kaolin which was initially remoulded with water was, it is suggested, predetermined at that stage in its history. Furthermore, although the water was subsequently exchanged with carbon tetrachloride the fabric could conceivably have remained virtually unchanged because the carbon tetrachloride failed to dislodge the few molecular layers of water which not only remained within the adsorption phase but were sufficient to determine microstructural behaviour.

These comments by no means deny the main conclusions, but will serve it is hoped, to stimulate further thought on the matter.

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The effect of increasing strength with depth on the bearing capacity of clays

DAVIS, E. H. and BOOKER, J. R. (1973). *Geotéchnique*, 23, No 4, 551–563.

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The Authors are to be commended for their excellent analysis of the bearing capacity of clay ($\phi = 0$) when the shear strength increases linearly with depth. I have also studied this problem. A purely kinematic solution to the problem was constructed (Salençon, 1968, 1969) using Prandtl's orthogonal net of zero-extension lines; the following upper bounds were obtained:

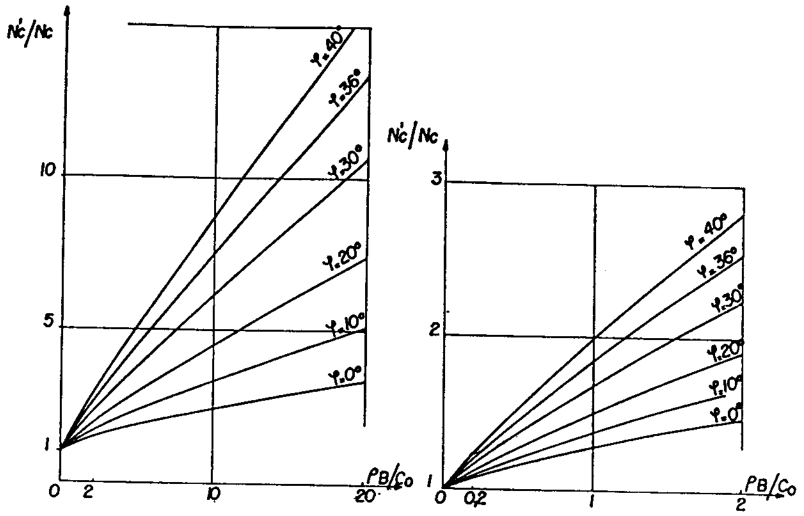
smooth rigid footing

$$Q/B = C_0(\pi+2+\rho B/C_0) \quad . \ . \ . \ . \ . \ . \ . \ . \ . \ . \quad (1)$$

rough footing

$$Q/B = C_0(\pi+2+2\rho B/C_0) \quad \text{for} \quad \rho B \leqslant C_0/2 \quad . \ . \ . \ . \ . \quad (2)$$

$$Q/B = C_0(\pi+3+\rho B/C_0 - C_0/4\rho B) \quad \text{for} \quad \rho B \geqslant C_0/2 \quad . \ . \ . \ . \quad (3)$$



φ	0°	10°	20°	30°	36°	40°
N_c	5,14	8,34	14,83	30,14	30,59	75,31

Fig. 1. Values of N'_c to be used in equation (4)

It was thus shown that the result obtained by Kuznetzov (1958) using an approximate method, and by Spencer (1961) using perturbation methods was a true upper bound for a smooth foundation. The problem was also dealt with by Berthet *et al.* (1972), using the 'method of slip line fields' as in the Authors' paper, in both cases for smooth and rough footings. The results for q were obtained in complete accordance with Figs 4 and 8, and for Q/B as a function of $\rho B/C_0$, for which equations (1) and (2) were shown to be analytical asymptotic expressions when $\rho B/C_0 \ll 1$. Thanks to the Authors' extension of the stress field corresponding to the slip-line solution, we can say that equations (1) and (2) are convenient approximations of the real value of the bearing capacity for small non-homogeneity.

The case $\phi \neq 0$ was investigated by Salençon *et al.* (1973) by the slip line method. Assuming the validity of Terzaghi's superposition method the bearing capacity was written

$$Q_{\text{ult}}/B = \gamma B/2\, N_\gamma(\phi) + C_0 N'_c(\phi, \rho B/C_0) \quad . \; . \; . \; . \; . \; . \; . \quad (4)$$

the values of N'_c which were computed are plotted in Fig. 1 of this discussion. Under the same assumptions, for $C_0 = 0$, the bearing capacity is

$$Q_{\text{ult}}/B = \frac{\gamma B}{2} N_\gamma(\phi) + \frac{\rho B}{2} N_\gamma(\phi)/\tan\phi \quad . \; . \; . \; . \; . \; . \; . \; . \quad (5)$$

which gives the asymptotic behaviour of equation (4). For $\phi = 0$, equation (5) becomes undetermined, and the expression for the bearing capacity was given

$$Q_{\text{ult}}/B = \rho B/4 \quad . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \quad (6)$$

as was also found by the Authors. However the stress field presented in Fig. 5 seems to me to be questionable. The complete proof of equation (6) will be given in a forthcoming paper by myself.

The comparison with the slip circle method made by the Authors is highly relevant and it might be interesting to note that Obin (1972) reached similar conclusions when dealing with the bearing capacity of a two-layer cohesive subsoil: the bearing capacity is over-estimated by the slip circle method.

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News items

International Society for Soil Mechanics and Foundation Engineering News

Membership

Romania is the 49th National Society to join the ISSMFE and their 27 members bring the total in the family to just over 10 000. The Chairman of the National Society is: Professor Emil Botea, Consiliul Naţional al Inginerilor şi Tehnicienilor (CNIT), Comitetul de Geotehnică şi Fundaţii, Calea Victoriei nr. 118, Bucharest 22, Romania, and all correspondence relating to it should be addressed to him.

Professor Dušan Krsmanović

The International Society and the Yugoslav Society for Soil Mechanics and Foundation Engineering in particular have suffered a great loss by the death of Dušan Krsmanović in Belgrade, on 23 March, 1974, following a long and serious illness. He was a member of the Academy of Sciences and Arts of Bosnia and Hercegovina, a professor at the Civil Engineering Faculty in Sarajevo and director of the Geotechnical Institute of that faculty.

Professor Krsmanović was born in Sarajevo in 1908. He obtained his degree at the Civil Engineering Department of the Technical Faculty in Belgrade in 1931 where later, in 1957, he became a Doctor of Science. He was one of the founders of the Technical Faculty in Sarajevo, and an outstanding teacher, from the year 1950 until his death, as well as being a founder of the Geotechnical Institute. In 1961 he was elected a member of the Academy of Sciences and Arts of the Socialist Republic of Bosnia and Herzegovina. He was the author of a great number of interesting scientific works in the fields of soil and rock mechanics. His work in rock mechanics represents the basis for the development of research in this field of civil engineering. He was a member of the Yugoslav Society for Soil Mechanics and Foundation Engineering from the foundation of the Society, was its Secretary from 1954 to 1959 and held the office of President from 1959 to 1966. He was a member of the Executive Committee of the Yugoslav Society for Rock Mechanics from the foundation of that Society in 1965.