

## ENGLISH SUMMARY

UDK 624.131

KORHONEN, KALLE-HEIKKI, Old and new theories in soil mechanics

The article deals with empiric material functions used in developing classical theories of soil mechanics. As an example on the formulation of theories in soil mechanics the one of Janbu's consolidation theory is presented. The most important theories of classical soil mechanics and their applications are given in Table 2. The theory of constitutive equations has become the central research subject in "new soil mechanics" and from this field the formulations based on the flow rule and the flow ratio of deformation equation are presented. The flow rule is derived from the flow rule of Rowe's dilatation theory and the equation of flow ratio from equations characterizing the mean progress in stochastic birth-death -process. The deformation equation is verified by the results of triaxial test worked out on Oulu clay.

UDK 624.046.2/.5

HEINISUO, MARKKU, A structural lower bound theorem and its application

The article deals with the approximate determination of the smallest limit load of a structure. Lower and upper bound theorems are derived. The partition formula based on the convexity theorem is applied mainly on elastic stability problems. The partition theorem gives good results especially for the limit loads of frame structures.

UDK 624.075.23/.24:624.012.454:669.  
14.018.29

OKSANEN, TUULI, LUMME, PENTTI and KANERVA, PEKKA, The use of the H16M strength steel A500H as column reinforcement

The purpose of this study was to clarify the possible advantages in the use of the high strength steel A500H as column reinforcement. The experimental part of the investigation consisted of the testing of fifteen columns with square cross sections having dimensions  $250 \times 250 \text{ mm}^2$ . Columns were in pairs similarly reinforced by steel A500H and A400H. The amount of reinforcement varied from minimum to maximum according to the Finnish code of practice.

In all the columns the bars were yielding at the failure load. Maximum strains at the middle of the columns were 2.0 o/oo in the columns reinforced by steel A400H and 2.6 o/oo in the columns reinforced by steel A500H. In addition the ultimate loads were proportional to the steel strengths. The behaviour of the columns reinforced by steel A500H was similar to that of the columns reinforced by steel A400H.