

## ENGLISH SUMMARY

### AN ANALYSIS OF SIMPLY SUPPORTED CONTINUOUS PLATES WITH LOADS OF RECTANGULAR SHAPE

*Seppo Orivuori*

*Rakenteiden Mekaniikka 2 (1969) pp. 132 to 143*

The article deals with the simply supported continuous plates represented in figures 7—10. The formulas for the deflection, the bending moments of the plate middle, and for the supporting moments are derived by using the small-deflection theory of thin plates. At first, the value of the Poisson's ratio  $\nu$  is assumed to be zero. Chapter 6 gives advice how to take the real value of  $\nu$  into account. The results of the computer-aided calculations for the plates in figures 7 and 8 are represented in the tables 1—72. The table values are given by using the coefficient  $Pa^2/100K$  for deflections and the coefficient  $P$  for bending moments, and the ratios  $b/a$ ,  $2c/a$ , and  $2d/b$  as parameters. Here,  $P = 4cdq$  is the total load on the individual plate,  $a$  the length of the individual plate, and  $K$  the flexural rigidity.

The deflections and bending moments of the plates in figures 9 and 10 can be obtained from the tables of the corresponding plates in figures 7 and 8 by using correlation functions (4.10) — (4.12). Finally one illustrative example of the use of the tables is given.

### FREE FLEXURAL VIBRATIONS OF STRUCTURES

*Erkki Pennala*

*Rakenteiden Mekaniikka 2 (1969) pp. 168 to 173*

Article handles free flexural vibrations of continuous beams and frames in undamped cases. An flexibility coefficient approach, determination of the flexibility matrix for a structure, and of characteristic values and vectors are presented in matrix form.

As an application the characteristic angular velocities of symmetric and antisymmetric

vibrations of hinged and built-in frames are calculated, when mass of the structure has concentrated to nine points.

### A PHOTOELASTIC STUDY FOR DETERMINATION OF THE SITE FOR STRESS MEASUREMENTS IN ROCK.

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*Rakenteiden Mekaniikka 2 (1969) pp. 174 to 181*

In the present work the determination of the most favourable site for the continuous stress measuring in the neighbourhood of a stope at the Pyhäsalmi mine is investigated. The purpose of the measurements is to control the hanging wall which is inclined about  $30^\circ$  to the vertical.

The changes in the stresses around the stope are caused by the changes in the state of stress in the rock mass or by the changes in the shape of the stope. The photoelastic method is used in this work to study the various cross sections of the stope. The main interest is concerned to the effect of the shape change of the stope which assimilates the collapse of the hanging wall. When the results are applied in the field, one has to take into account the geological features which are not characterized in the models.

The results show very clearly that the most favourable site for the measurements of the stress changes is near by the top of the stope. The changes near by the bottom corner are greatly effected by the shape of the corner but not necessarily by the changes of the shape of the stope. The stress changes in the middle portion of the stope are small and may not indicate the stope shape changes at all.

The stress measurements must be effected outside the fractured zone which may occur around the stope. In order to analyze the changes, the measurements should be taken in three directions, in one hole, and at various distances from the stope.