ENGLISH SUMMARY

UDC 624.073:624.041.6

MIKKOLA, MARTTI, ORIVUORI, SEPPO and VARPASUO, PENTTI, Cantilever plate strip of variable thickness. Rakenteiden Mekaniikka 6 (1973) 1, p. 15...35.

A cantilever plate strip of variable thickness and reinforced with an edge beam is investicated. A concentrated load is applied at the edge beam. Solution of the problem was achieved by using Fourier integral transform. The solution is exact only for exponentially varying thickness but is can also be used as an approximation for the case of linearly varying thickness. Numerical results for the clamping moment, the bending moment and the deflection of the edge beam have been calculated and tabulated for different values of the stiffness ratio $\kappa = B/D_1 a$ and $\epsilon = \ln (h_0/h_1)$, where B is the flexural rigidity of the edge beam, D_1 is the flexural rigidity of the plate at the reinforced edge, a is the length of the cantilever, h_0 and h_1 are the thicknesses of the plate at the clamped and reinforced edges, respectively.

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624.131.537

HAKALEHTO, KALLE, Control of rock structures by stiffness analysis. Rakenteiden Mekaniikka 6 (1973) 1, p. 3...14.

Rock structures differ from other in many ways. The most important difference is perhaps, that rock is usually more or less fractured.

The failure behaviour of rock has been studied in laboratories using stiff and servo controlled testing machines. These machines follow the behaviour of failuring material beyond the maximum load. The servo control has increased the performance of the stiff machines. The relative stiffness of the machine and the sample determine whether the failure is controlled or violent.

In this paper the knowledge of the failure behaviour of rock has been applied to rock structures using a rock pillar as an example. The experimental material has been taken from literature. The stiffness analysis is possible using the finite-element method.

If we can control the stiffness of rock structures, we can control to a large extent the behaviour of the structures. The main importance of this is that we can avoid violent failures and unexpected damages caused by sudden collapses. Stiffness analysis should be included to the first stages of planning rock structures to make the full use of it. Measurement should be made to check the stiffness model while excavating.