

ENGLISH SUMMARY

UDK 624.042.41:69.032.2

TEIKARI, PEKKA, The measurement of the natural periods of buildings

The free vibrations of high rise buildings under strong wind conditions were recorded using an ordinary seismograph recorder combination. The registration was then analyzed in two ways, by using the normal evaluation of a seismogram and by converting the material into digitized form and calculating power spectra. The results achieved were compared with each other.

UDK 624.012.1:624.072.32:624.074.2:624.075

PARLAND, HERMAN, The stability of stone-structures

The paper deals with the so called paradox of a voussoir arch, i.e. the arch is stable in any possible state of equilibrium inspite of the numerous potential hinges and sliding joints between the voussoirs. The paradox is complete, i.e. in every possible state of equilibrium, if the voussoir joints follow the so called rigid friction hypothesis. In the case of real friction the paradox, however, does not work to the same extent. The linear stability theory based on the rigid body mechanics gives a simple geometric explanation to these phenomena, as well as to the erection of the bold ancient arch and dome structures without preceding calculations. The element construction of today actualizes this obsolete theory.

UDK 624.042.1:624.072.23

KILPELÄINEN, MIKKO, The effect of the torsional stresses acting in the top-slab to the distribution of forces in a reinforced concrete beam-grid.

This article deals with structural analysis of rectangular, regular reinforced concrete beam-grids. Because of cracking of beam-webs the top-slab carries all the torsional stresses. A method based on the theory of linearly elastic plates and the method of finite differences is presented for the analysis. A special attention is paid to the twist of the slab. The effects of boundary conditions and the beam-height to slab-thickness ratio are investigated in an example. It is recommended to analyse a beam-grid in practice assuming that the torsional stiffnesses of the beams as well as that of the slab are zero.