

ENGLISH SUMMARY

UDK 624.012:624.042

MÄKELÄINEN, PENTTI, Basic principles in estimating the strength and load-carrying capacity of laterally loaded masonry walls. Rakenteiden Mekaniikka 9 (1976) 3, p. 1...12.

Main features about the strength properties and stress-strain behaviour of laterally loaded masonry walls are briefly discussed. A formula (equation (2)) derived by the author for estimating the moment capacity of a horizontally spanned masonry wall is presented. The inapplicability of the yield line theory to analysis of laterally loaded masonry walls has especially been emphasized.

UDK 624.074.7:624.042:532.59

HOSIA, LAILA, Ocean wave forces on offshore structures. Rakenteiden Mekaniikka 9 (1976) 3, p. 12...27.

The article deals with forces due to wave motion on cylindrical objects. Also, mathematical grounds are presented and equations are given for some simple cases. The application ranges of either the Morison formula, the diffraction theory or the theory of complete reflection are determined on the basis of the size of the object and wave length. Also, the use of the energy spectrum of irregular wave motion is discussed. Finally an example is given of how to calculate the wave loads on a pipeline in seabed.

UDK 624.012.45:624.073:624.042

SIITONEN, RAIMO and MIKKOLA, MARTTI, The finite element analysis of reinforced concrete folded plates. Rakenteiden Mekaniikka 9 (1976) 3, p.28...38

The paper is concerned with a study of reinforced concrete folded plates using the finite element method. The model for the mechanical behaviour of reinforced concrete includes the initial elastic behaviour, the cracking phenomenon, and plastic yielding of concrete and reinforcement. The membrane state of stress was assumed in the plates, and the bending action was neglected. Incremental loading has been used to trace the load-displacement relationship of the structure. Within each load step the solution has been achieved by the residual force method. The convergence of the iteration process was accelerated by a modified Aitken's σ^2 -process.

Several cases corresponding to experimental investigations found in literature were analysed using the program developed. Comparisons between calculated and test results indicate that the omission of the bending action results in considerable error in load-deflection relationship and ultimate load for short and intermediate shells. The behaviours of long shells can be predicted satisfactorily.