UDK 666.974,6

PIHLAJAVAARA, S.E., Basic principles of the mechanics of fibre reinforced concrete. Rakenteiden Mekaniikka 6 (1973) 3-4, p. 123...146.

An introduction to the principles of the mechanical behaviour of fibre reinforced concrete, concrete matrix and fibres is presented, including a brief historical review, a discussion of cracking, fracture, permissible strains and stresses, equations of tensile strength with different approximations and examples. In the Appendix, the stress and length of fibres in fibre reinforced materials are dealt in details.

UDK 624.072,2:624.012,45

MÄKELÄ, KARI, Design of reinforced concrete beams with rectangular cross-section for bending. Rakenteiden Mekaniikka 6 (1973) 3-4, p. 147...158.

A method to design reinforced concrete beams with rectangular cross-section and reinforcement of A40H (yield strength 4200 kp/cm$^2$) or A60H (yield strength 6000 kp/cm$^2$) on the basis of the load bearing capacity is described. Designcurves are given for both steel classes. The designcurves take into account the slight influence of compression steels but not the influence of safety factors. With some limitations the method is also valid for non-rectangular cross-sections. The load bearing capacity calculated by this method correlates well with testresults.

UDK 624.042:624.012,46
539.37

SALONEN, SEPPO, Analysis due to transportation and mounting of prestressed concrete beams differing from their ideal form. Rakenteiden Mekaniikka 6 (1973) 3-4, p. 159...170.

The deformations and stresses of a pretensioned concrete beam under transportation and mounting are considered. The beams are supposed to have a simple form of initial curvature and twisting angle. The concrete has been supposed to follow Hooke's law until cracking. The cross section of the beam has been assumed to be double-symmetrical, and no additional normal forces have been applied. The latter assumptions are not, however, essential.

The problem has been solved by the aid of equilibrium method using differential equations and power series. Following cases have been dealt with: erection at the ends of the beam, twisting to a given twisting angle between the ends, eccentrical supporting, and eccentrical loading. The dynamical effects have not been considered.

UDK 624.073:624.012,45

TUOMIOJA, MAURI and PUNAKALLIO, RISTO, Influence of arching force on the bearing capacity of reinforced concrete slabs. Rakenteiden Mekaniikka 6 (1973) 3-4, p. 171...189.

A method based on the theory of plasticity is presented for the determination of the ultimate loads for slabs having their edges fixed in the direction of the plane of the slabs. In addition another method is presented making it possible to take into account the influence of the elastic deformations in the calculations.

Results obtained by the method have been compared with results obtained from laboratory tests for slabs and strips of slabs performed at the Helsinki University of Technology. The results indicate that the method can be used for the determination of the ultimate load but that the value obtained for the aching force is too big.

UDK 624.07:624.012,45

VARPASUO, PENTTI, Comparison between design practices for reinforced concrete structures in Finland and in the Soviet Union. Rakenteiden Mekaniikka 6 (1973) 3-4, p. 190...198.

The codes of practice in both the countries allow the use of limit state design. Comparisons are made between the codes in the collapse limit state design for flexural members. The partial safety factors for material strength are about 5 % more conservative in the Soviet Union. The partial safety factors for loads are about 25 % smaller in the Soviet Union. The total effect of this makes the Finnish codes of practice demand about 20 % stranger cross-sections in respect to moment capacity. An example of the design of a beam with rectangular cross-section is given.