

SUMMARY

The ductility is a desirable characteristic in any structural design since it guarantees the safety of the structure to unforeseen load surcharges and/or load inversions. It is necessary to point out that in the columns placed in the buildings of armed concrete the formation of plastic patellae is possible, especially in the support union foundation. The capacity of distortion of the support depends on the slenderness. Nevertheless, there are scarce the experimental essays of supports of average slenderness (between 5 and 10) submitted to cyclical charges made with concretes with or without steel fibres.

For such a motive, in the present doctoral thesis there has been studied the behaviour of slender supports submitted to combined efforts of constant compression and cyclical side load. The variables that have studied sound: the slenderness, the level of axial load, the quantity of transverse armour, the resistance of the concrete and the content of fibres of steel in the concrete mass.

25 experimental essays have been realized with the target to know the behaviour of this type of elements, there being obtained experimental results that have allowed to calibrate a numerical model with the Program "OpenSees" and validate simplified methods.

Additionally a study has developed a parametric study with 954 numerical essays, which has allowed to propose methods simplified for the evaluation in the capacity of distortion in supports of armed concrete, for the flexible state and the last state.

The methods proposed in the present thesis, have been developed for the cross-check and design in supports of armed concrete; from them, there is possible to foresee the behaviour expected according to the parameters like the effective and last flexible rigidity, the effective and last flexible displacement, and the ductility in displacements.