

Numerical Analysis of Punching



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Objectives

Punching is one of the most complex phenomena in reinforced concrete flat slabs, since it occurs in a geometric discontinuity zone where the stresses are highly concentrated in a small area.

The use of numerical analysis tools has assumed significant importance in civil engineering, these enable the simulation of the behaviour of reinforced concrete structures or part of them.

Prestressed, Fiber reinforced (FRP), High Strength (HSC) and regular concrete flat slabs are considered in the research.

Methodology

Using 3D nonlinear finite element analysis software able to simulate the reinforced concrete real behaviour .

Numerical simulation of experimental specimens in order to obtain numerical models benchmark.

Parametric studies covering a large range of the parameters that influences the punching failure, taking into account the benchmarked numerical model.

Expected Results

The numerical models were able to accurately predict the experimental behaviour of flat slabs.

The numerical analysis can be used to study further strengthening techniques schemes and study the applicability of the HSC and FRC to further situations that otherwise would be time consuming and costly to perform in laboratory.

