ANALISYS OF AN RC BEAM-COLUMN JOINT BY THE FINITE ELEMENT METHOD TO DEFINE AN EFFICIENT REINFORCEMENT

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ABSTRACT

The beam-column joint is a critical region on the reinforced concrete (RC) frame structural system due the critical tasks that it accomplishes and load conditions to which it is subjected. Its reduced geometry and the material's bond interaction of which the beam-column joint is compounded results in a non-linear behavior that is influenced by several variables. In this study, the mechanical behavior of the beam-column joint in Serviceability Limit State (ELS) is analyzed by means of a numerical model of finite elements. A comparison between the results obtained and those reported by other authors (experimental and numerical) is presented in order to validate the numerical model developed. The results showed that crack propagation due the negative bending moment on the beam significantly decreases the stiffness and introduces an increase of stresses on the joint. An open stirrups configuration in the upper half of the depth of the beam is proposed in order to control crack propagation.

Keywords: Beam column-joint, Finite Element, Cracking, Numerical Analysis, Reinforced Concrete.

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