CONSIDERATION OF SHEAR EFFECTS DURING CONCRETE CRUSHING USING THE OVERLAPPING CRACK MODEL

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Abstract. A new model for crushing failure of concrete is considered in Carpinteri et al. (Int. J. Fract, 2010, 161:161-173) through the so called overlapping crack model. In this model, cohesive elements are considered and present interpenetration in compression when concrete is crushed. In the present work this methodology is implemented in a finite element framework, considering also a residual strength in shear due to friction. To take into account this effect, the Coulomb friction law is considered. The effect of the concrete microstructure, such as aggregate size, is also included. Examples considering the fracture of 3-point beams are tested with good correlation with experiments.