Modelling of Damage Patterns of RC Concrete Columns Under Demolition by Blasting

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Abstract

A numerical study for damage of RC columns under demolition blasting has been carried out and the results were compared with available experimental work. Basic considerations for the finite element method of the LS-DYNA Program are introduced. Equations of state models as well as three constitutive material models (the concrete mass, the reinforcing steel, and the high energy explosive material) are described in detail. In the present work, three Finite Element modeling of steel bars as beam, solid elements or by converting reinforcement quantity into concrete solid elements have been examined through comparison with available experimental work. The influence of different parameters on the blasting damage pattern of RC columns has been investigated. These parameters include steel rebar arrangement, explosive factors and the concrete strength of columns. The results have been presented and discussed.
Keywords: demolition, blast, damage pattern, RC column, explosive factors, LSDYNA, experimental results, solid element, beam element, finite element models

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