

## **Nonlinear finite element modelling of failure modes in RC slabs**

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**Abstract:** With the development of generalized nonlinear finite element modelling, this paper delineates the various failure modes of a RC slab in terms of damage dominated either by tension cracking in concrete or plastic yielding leading to concrete crushing. Commonly observed failure modes of such slabs are classified according to the level of each damage component. Such a classification helps separate the flexure-shear failure mode of RC slab from the true punching or shear mode of collapse. The influence of main tensile reinforcement on the metamorphosis in failure modes is highlighted by the nonlinear finite element model, using as an illustration, patch loads whose size bear a similar ratio to the size of the slab as the ratio of the print of a wheel to the size of a deck slab. Also the beneficial effect of edge restraint on punching capacity is highlighted.