

CALIBRATION OF A NUMERICAL MODEL FOR MASONRY WITH APPLICATION TO EXPERIMENTAL RESULTS

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Abstract

A calibration of a numerical model for analysis of masonry walls with application to experimental results is presented in this paper.

The experimental results used for the calibration are derived from the research project “Optimization of shape of masonry units and technology of construction for earthquake resistant masonry buildings” conducted by Bosiljkov and Tomažević in 2005 for ZAG Ljubljana. This paper adopts micro-modelling strategy for analysis of masonry specimen with a use of discrete element method and application of different nonlinear material models both for blocks and mortar. In order to determine the values and to calibrate the necessary material data for the used materials that were not obtained experimentally, several numerical investigations and simulations were performed. A comparison of Numerical and Experimental Results as well as a comparison of the Failure Mechanisms is given.

With the assumed strategy and the numerical method, a good concordance with the experimental results with respect to the limit state and developed failure mechanisms is obtained.

Keywords: discrete element method, failure mechanisms, masonry, micro-modeling, nonlinear analysis, UDEC.