

# Calculation and modelling of a shear test on a 4 meter concrete slab strip without shear reinforcement

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The size effect of reinforced concrete members without shear reinforcement under shear has been considered a riddle for years. The shear failure process involves several physical mechanisms. Starting from different mechanism(s), different researchers have proposed several theoretical models on this phenomenon. Although most of the models compare well with the currently available test results, they can be extrapolated towards quite different directions when the depth of the specimen becomes even larger. On the other hand, in the engineering practice, the dimensions of the structural elements are getting larger, they are often beyond the largest available test specimens. These large elements are usually of great importance. Therefore an accurate size effect model is rather important for structural safety. In order to check the extrapolation of the current size effect models on shear, in May 2015, a shear test was carried out by Prof. Collins and Bentz in the University of Toronto. The depth of the specimen reaches 4 meters. It is the largest recorded shear test up to now. Before the test, they proposed a competition to predict the test results, which is open for all types of theoretical models or Non linear FEM programs. Although the competition has finished, it can still be considered as a valuable case study to evaluate the Non-linear FEM simulations. In this presentation, this competition and the related shear theories on the size effect of reinforced concrete members without shear reinforcement are introduced. Further study with TNO-Diana on the test are called for within the group of Diana users.