

# FEM simulation of static loading test of the Omega beam

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**Abstract.** The paper deals with a FEM simulation of static loading test of the Omega beam. Omega beam is a precast prestressed high-performance concrete element with the shape of Greek letter omega. Omega beam was designed as a self-supporting permanent formwork member for construction of girder bridges. FEM program ATENA Science was exploited for simulation of load-bearing test of the beam. The numerical model was calibrated using the data from both static loading test and tests of material properties. Comparison of load-displacement diagrams obtained from the experiment and the model was conducted. Development of cracks and crack patterns were compared. Very good agreement of experimental data and the FEM model was reached. The calibrated model can be used for design of optimized Omega beams in the future without the need of expensive loading tests. The calibrated material model can be also exploited in other types of FEM analyses of bridges constructed with the use of Omega beams, such as limit state analysis, optimization of shear connectors, prediction of long-term deflections or prediction of crack development.