Structural response of full-scale concrete bridges subjected to high load magnitudes - DTU Orbit (26/02/2019)

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A project concerning full-scale testing of concrete bridges was initiated in September 2016 in Denmark. Four bridges were tested, and the structural response of the bridges evaluated. Two bridges consisted of overturned concrete T-beams (OT-beams), and two bridges were constructed by joining L-shaped concrete elements.

The test method is outlined in the paper, which includes a description of a novel test-rig used to apply a high magnitude loading. It was shown that the test rig could perform controlled testing in only one day, which is an important aspect, since available time (due to traffic disturbance) often is an issue when testing on site. Also, different types of measuring equipment such as lasers, LVDTs and DIC-cameras was investigated, in order to evaluate the deformations during loading of one of the OT-beam bridges. The monitoring equipment was studied to verify if such equipment efficiently could be used for in-situ measurements. The load was applied semi-deformation controlled by a combination of dead load and hydraulic jacks. The novel high magnitude loading-rig worked well. It was also possible to achieve good readings from the monitoring equipment in combination with the applied loading.

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