Probabilistic substantiation of proof load testing

Proof load testing

Due to the constant aging of infrastructure, increased traffic load and traffic intensities, methods are explored by which the reliability of existing road bridges and viaducts can be assessed. In case limited information of the structure is available or its condition is of concern, load testing may be used to prove a degree of load-carrying capacity.

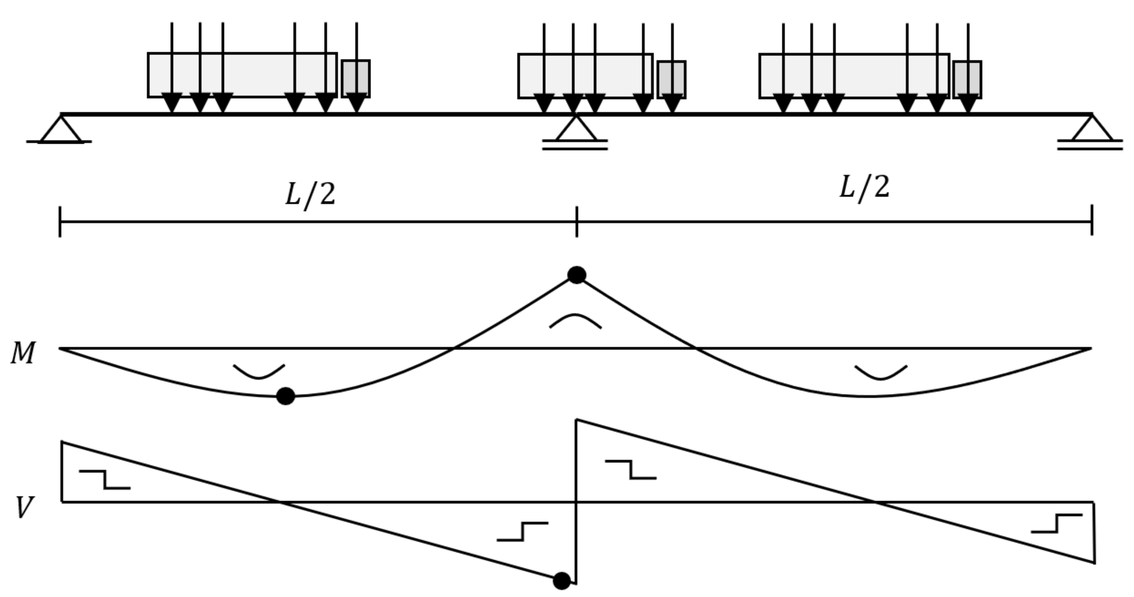
Pilot proof load test on viaduct Vlijmen-Oost using the specialized BELFA test vehicle

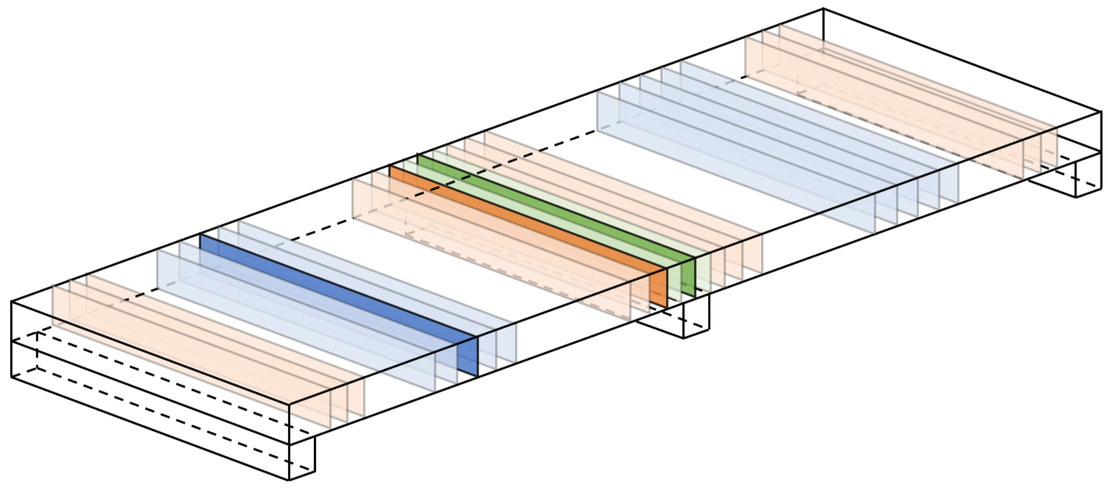
Load test on Ruytenschildt bridge using a steel load spreader structure, hydraulic jacks and counter weights

Goal and expected results

A flexible framework is developed in which the following aspects are specifically addressed:

- Time-dependence of the structural reliability (deterioration, traffic load trend and proven strength)
- Reliability of the stop-criteria used during the load test
- Knowledge level and the influence on the type of assessment
- Spatial uncertainty when testing a limited number of cross-sections, failure mechanisms and spans





Visualization of the cross-sections to be assessed using system reliability to address spatial uncertainty

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