

# Investigation on the influence of corrosion level on static and dynamic response data of reinforced concrete beams

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## Abstract

In circular construction, an important topic is the reuse of structural components. In order to enable this reuse, there is a need for effective methods to assess the remaining resistance of these components. An important challenge herein is the impact of degradation mechanisms, such as corrosion. Different studies have illustrated how strain data from proof-loading and modal data from vibration tests can be used to estimate the corrosion level of existing reinforced concrete structures. However, a lot of these studies are based on virtual measurement data. The relationship between the corrosion degree and real-case data is often less straightforward. To get a better insight in these challenges of real-case data, an experimental campaign has been performed in the Magnel-Vandepitte laboratory at Ghent University. Different real-size reinforced concrete beams have been subjected to accelerated corrosion. They have been subjected to 4-point bending tests and vibration tests. Afterwards, the beams were loaded until failure, and the actual corrosion degree was determined based on the mass loss of the reinforcement. The influence of the corrosion degree on the measurement data has been investigated. From these analyses, important conclusions can be drawn towards future experimental campaigns on the one hand, but also towards the use of Bayesian inference for assessment of the corrosion degree on the other hand.

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