

Damage Evaluation of an ASR-Affected Concrete Viaduct by AE-Measurements during Proof Loading

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Abstract

Non-destructive testing of concrete structures becomes increasingly important when assessing in-service concrete structures. One of the non-destructive testing techniques that can be used to get insight in the structural state of a viaduct is acoustic emission (AE) measurements combined with proof loading. However, interpretation the AE measurements is challenging, especially when the concrete is cracked by alkali–silica reaction. Due to the existing cracks the wave attenuation affects the acoustic emission measurements. This research project, on smart proof loading of concrete structures, focusses on implementation of acoustic emission signals during proof loading. The viaduct presented in the poster was proof loaded by the Belfa belastungsfahrzeug. The end span of the viaduct was tested with load combinations for bending and shear. By using cyclic loading it is investigated whether shear failure can be recognized. Another aspect during loading was the noise of the traffic. The poster gives an impression of the AE damage evaluation of an ASR-affected viaduct.