

Multi-scale deterioration modelling for sustainable civil engineering infrastructure

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Decisions to maintain physical infrastructure have decades-long consequences for our collective environmental, social, and economic sustainability. In particular, decision-making criteria (limit states) which trigger maintenance actions throughout a deteriorating infrastructure's life cycle have a significant influence on the cumulative sustainability footprint. A number of technical limit states can be defined for a deteriorating concrete structure, which consequently leads to an analogous range of sustainability impacts. Purpose of this research is to develop a physics-based multi-scale modelling framework that allows for improving the basic understanding of the role of limit states for concrete structures and possible optimisation of limit states with respect to sustainability.

