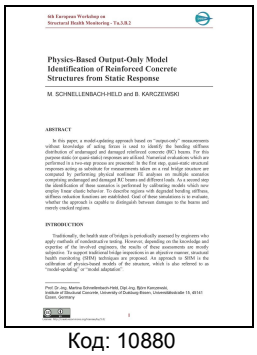

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Physics-Based Output-Only Model Identification of Reinforced Concrete Structures from Static Response

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In this paper, a model-updating approach based on "output-only" measurements without knowledge of acting forces is used to identify the bending stiffness distribution of undamaged and damaged reinforced concrete (RC) beams. For this purpose static (or quasi-static) responses are utilized. Numerical evaluations which are performed in a two-step process are presented: In the first step, quasi-static structural responses acting as substitute for measurements taken on a real bridge structure are computed by performing physical nonlinear FE analyses on multiple scenarios comprising undamaged and damaged RC beams and different loads. As a second step the identification of these scenarios is performed by calibrating models which now employ linear elastic behavior. To describe regions with degraded bending stiffness, stiffness reduction functions are established. Goal of these simulations is to evaluate, whether the approach is capable to distinguish between damages to the beams and merely cracked regions.

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Ключевые слова:

Содержание