Special Issue

Application of Intelligent Materials in Inspection, Repair and Reinforcement of Infrastructure

Message from the Guest Editors

Steel bridges often face great demands for strengthening or repairing during their service lives, especially due to fatigue and corrosion damages. Nowadays, intelligent materials such as shape-memory alloys, smart materials, and fiber-reinforced composites have great potential in the inspecting, repairing and upgrading of steel bridges, and in turn for the enhancement of their long-term performance. Taking Fe–Mn–Si alloys as an example, the martensitic transformation and its reverse transformation which produces considerable recovery stress (300~500 MPa), can be utilized as prestress for the local repairing of fatigue cracks in orthotropic steel bridge decks and also global upgrading of down-wrapped concrete beams. In this Special Issue, in comparison with traditional inspection and strengthening methods, mechanisms, techniques and applications of intelligent materials on the rehabilitation of steel bridges will be introduced and classified in detail.

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