

Management of Concrete Infrastructure in Conditions of Climate Change

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EPSRC Review of Ground and Structural Engineering (2009)

Identified “Sustainable construction and infrastructure: whole life cycle approach”, and “Monitoring and field investigation of existing infrastructure” as two out of four **main research themes**.

“Adaptation to Climate Change” and “Structural Health Monitoring” were identified as **the key research challenges** within these two themes, respectively.

*National Infrastructure Plan (2011) names climate change as a major challenge to national infrastructure and states that to respond to this challenge new and existing infrastructure needs to be climate resilient.

Partner Profiles

- **Heriot Watt University:**
 - Whole Life-Cycle analysis and role of deterioration on bond in RC
- **University of Surrey:**
 - Infrastructure and asset management in response to deterioration and aging
- **Transport Research Laboratory:**
 - Inspection/Structural assessment and Structural point cloud imaging.
- **University of Greenwich:**
 - Large scale environmental chamber for accelerated durability testing
- **University of Glasgow:**
 - Multi-scale modelling of concrete structures

Research Questions

- Should durability requirements for new concrete structures be updated in order to account for effects of climate change, and if so, what changes should be introduced?
- What other adaptation measures can be implemented to ensure adequate durability of existing/new concrete structures over their service life taking into account effects of climate change?
- How should owners and operators determine the most effective strategies for maintenance of populations of concrete infrastructures under changing climate conditions?

Programme Themes

- Modelling of environmental loading, screening of deterioration processes and analysis of available field data (HW)
- Monitoring of existing concrete structures (Surrey/TRL)
- Repair and renovation techniques (HW)
- Experimental studies in environmental chamber (Greenwich)
- Development/validation of predictive models for deterioration of non-repaired and repaired concrete structures (Glasgow)
- Life-cycle cost (LCC) analysis of deteriorated concrete structures in conditions of changing climate (HW)