Concrete is a fundamental building material with many beneficial properties arising from its strength, versatility and availability. However, several deterioration and distress mechanisms can occur because of the interaction between the concrete and its environment. When concrete starts to deteriorate, it is essential that it is investigated by experts.

BRE experts plan and undertake complete deterioration investigations, which provides a thorough understanding of potential deterioration mechanisms and the strengths and limitations of investigative techniques.

Concrete distress investigations

BRE provide professional evaluative consultancy with allied technical services for determining the extent, severity and cause of concrete deterioration, whilst providing advice on remedial measures.

Our investigative services including:

- Specialist site teams for NDT and destructive testing to determine the depth of cover to concrete, the condition of the reinforcement bars, crack monitoring, visual surveys, delamination surveys, UPV surveys, core and dust sampling.
- A chemical laboratory equipped to determine chloride, sulfate and cement content of cementitious materials, carbonation depth and pH content.
- A physical laboratory for compressive strength and flexural strength testing, along with long-term expansion testing.
- Petrographic examinations of a range of construction materials, including concrete and aggregates.
- Analytical techniques such as ICP-MS, XRF, XRD and SEM.
- Thermography
Distress and deterioration identification

A wide range of mechanisms can affect concrete and quite often multiple causes of deterioration are observed within the same structure. These tests allow for the identification of types of distress and deterioration such as:

- Reinforcement corrosion
- Internal and external sulfate attack
- Alkali-aggregate reactions (AAR)
- Construction errors
- Delayed thaumasite formation (DEF)
- Thaumasite form of sulfate attack
- Chemical attack
- Settlement and movement
- Temperature change
- Weathering and erosion
- Secondary deposits and leaching
- Fire-damage

Advice on a range of repair options

Upon completion of the investigation, our experts can discuss a range of repair or rehabilitation options and determine the most appropriate solution(s) depending on the required service life of the structure. Repair and rehabilitation advice include:

- Strengthening measures
- Concrete repairs
- Protective coatings
- Supervision of repairs
- Electrochemical treatment
- Waterproofing systems
- Decorative treatments
- Preparation of repair strategies

Site investigation techniques

A variety of NDT and SDT tests are available to determine the cause of deterioration, such as:

- Visual survey and assessment
- Crack monitoring
- Reinforcement bar detection
- Rebound hammer
- Moisture analysis
- UPV survey
- Pull-off testing
- Permeability analysis
- Coring and breaking out.

Contact Us

If you want to find out more about BRE's work in this area or discuss how we can support your project, please email enquiries@bregroup.com or call 0333 321 8811.