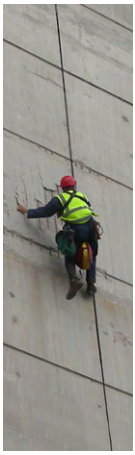
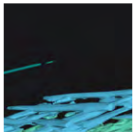
INITIVO
Testing Engineering Consultancy

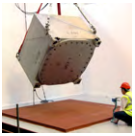


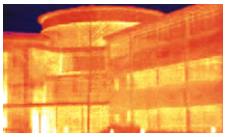



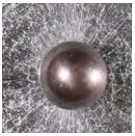


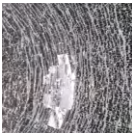



Building Pathology









What is Building Pathology?

Specifically, "Building pathology is the study of building defects, building decay and building performance failure to assist in the formulation of suitable remedial and management solutions"

Our experienced Building Pathology team provide a broad range of key services across the UK for the contracting, residential, property, and nuclear sectors. These range from investigation of water ingress, often a far from simple exercise, to carrying out condition surveys to thousands of structures for major infrastructure projects.

Techniques include intrusive and non-intrusive investigation, non-destructive testing, and UKAS accredited laboratory testing,

We provide a holistic service for the evaluation and assessment of the condition of buildings and structural elements, from investigation, through the implementation of remedial works, to monitoring and maintenance. Our expertise can be applied at every stage in the life cycle of a structure.

Contents

Investigation

Concrete Corrosion Assessment and Investigation

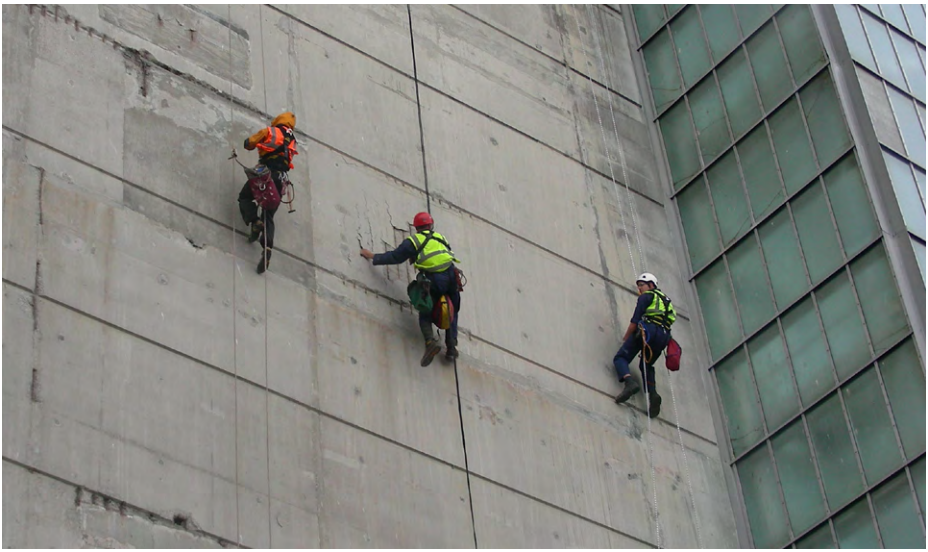
Investigations and surveys are carried out to establish the durability and capacity of a structure. Change of use/repurposing, refurbishment, new ownership, are all good examples of where this approach would be appropriate. Methodology includes:

Assessing concrete condition and durability

- Physical properties
- Chemical deterioration
- Composition analysis

Steel Assessment

- Tensile strength
- Integrity
- Grading/composition of reinforcement
- Risk of corrosion



Techniques

- Visual assessment
- Sample testing to establish history of corrosion
- Extent of deterioration
- Residual strength measurement
- Structural assessment
- Health and safety risk
- Laboratory testing
- Non Destructive Testing
- Non-intrusive inspection

Water Ingress Investigation

This is a common issue and identifying the sources can be far from straightforward. Our team use a variety of methods to establish cause and develop remedial methods.

On a recent project the client team had struggled for over two years with serious water ingress on a prestigious project. Our team identified the causes and put a remedial plan together within 3 days.

Non-destructive methods include:

- Protimeter mapping
- Drawing reviews
- Targeted spray tests
- Food dye testing
- Electrolysis

Full Building Investigation

This would be carried out a change of use or ownership or use (repurposing). Also, the findings can inform long-term investment strategy as in the case below:

- Roof leakage investigation
- Loading analysis
- Brickwork inspection and repair strategy
- Effluent plant concrete and corrosion surveys

Figure 1 Europe's largest brick built structure

Non Standard Investigation

Occasionally problems arise that have no obvious cause. However, by taking a methodic and professional approach our team can get to the bottom of the issue, establish cause and develop a remedial programme for our clients:

Contaminated substrate

Alkaline washout

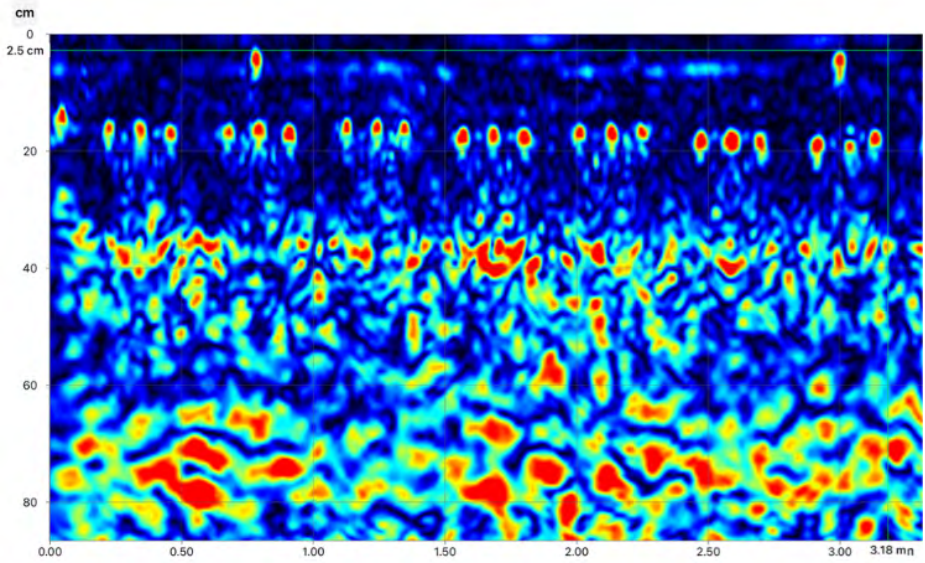
Non-Destructive Testing (NDT)

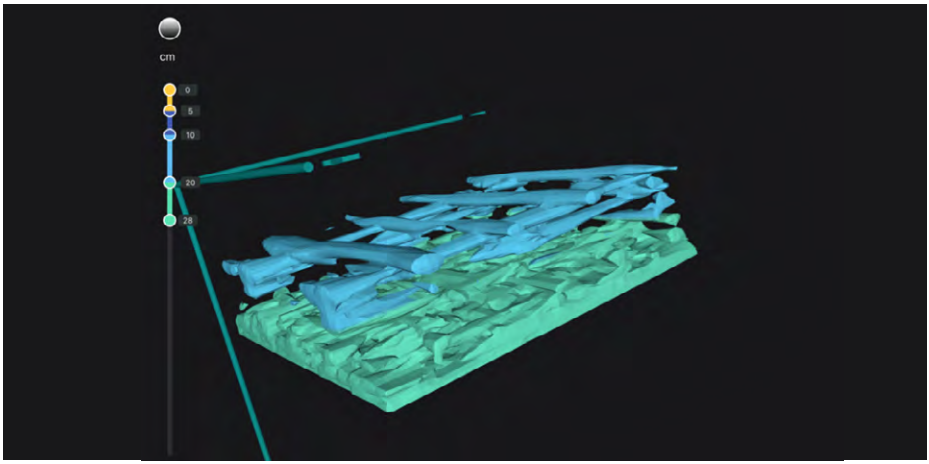
NDT methods are employed to remove the need for repetitive intrusive works.

There has been considerable innovation in this area, particularly around Ground Penetrating Radar (GPR), both in terms of the equipment and the software capabilities. We are able to see into concrete clearly with excellent visualisation and outstanding data capture. Our team will use the information gathered to inform our clients about potential or actual problems and suggest remedial activity where appropriate.

Ground Penetrating Radar

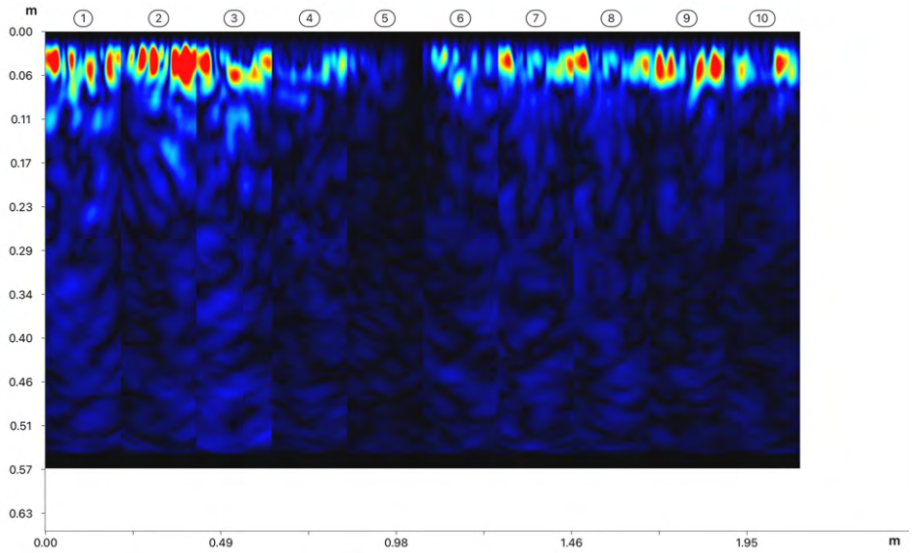
- 2D and 3D scanning
- Can scan up to 800mm+ deep
- Irregular and curved surfaces
- Augmented reality
- Congested rebar configurations understood





Ultrasonic

- Identify density changes (reinforcement and voids)
- Uniformity mapping
- Mapping of concrete homogeneity
- Concrete strength estimation
- Ability to assess elements that can only be assessed from one side (e.g., retaining walls)



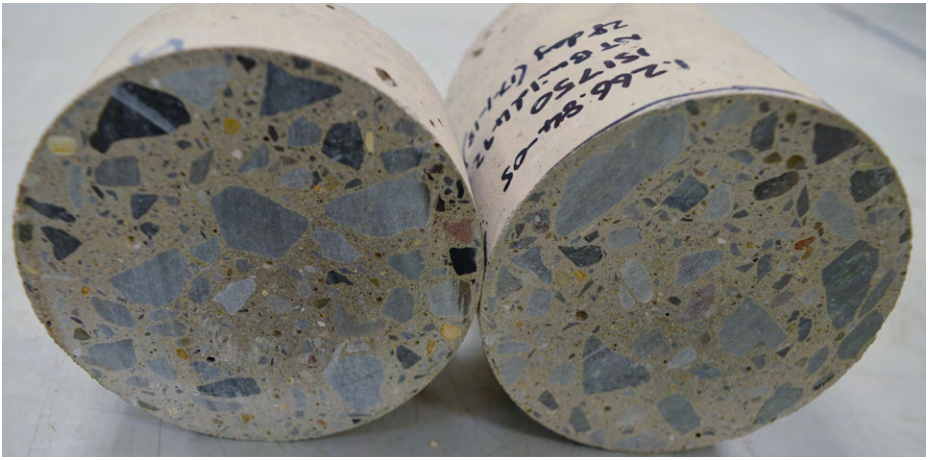
Other Services

Laboratory Testing **(UKAS accredited)**

Our materials testing laboratory allows us to ***self-deliver*** support services to our Building Pathology investigations. This reduces delay in the process and enables prompt understanding of any issues and faster development of remedial solutions.

Tests carried out include:

- Materials analysis
- Compressive strength
- Tensile strength
- Bending strength
- Weathering
- Carbon dioxide permeability
- Chloride ion ingress/ permeability
- Water vapour transmission
- Accelerated aging (UV)
- BS EN 1062 Compliance testing for paints and coatings



Building Condition Surveys

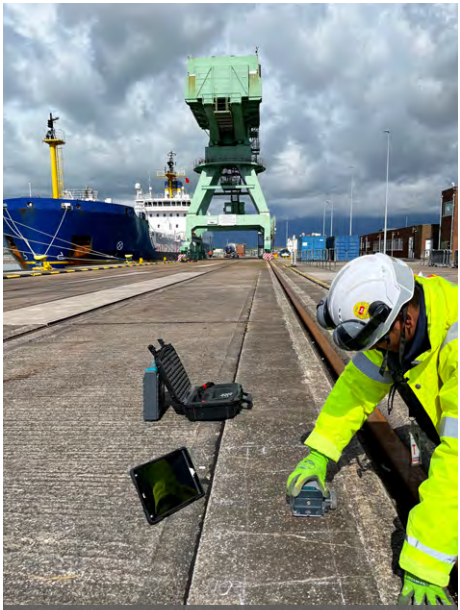
Surveys are carried out as part of long-term maintenance plans to assist with future cost planning. We also carry out condition surveys at pre and post construction stage on major infrastructure projects, for example Crossrail/Elizabeth Line and Thames Tideway Super Sewer.

For the latter two projects, thousands of structures, including ***heritage buildings***, were surveyed using innovative and efficient techniques.

Elements covered include:

- Full building/structure condition surveys
- Brickwork
- Roofing/envelope
- Intrusive and non-intrusive
- Corrosion
- Thermography

Bridge condition survey



Concrete condition survey

Saxon church

London Stadium redevelopment survey

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