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How can research help the construction industry?

For a low-carbon, sustainable and healthy built environment, leading UK universities bring you the latest in building research for new and retrofit construction. This will enable your construction operations – as well as the projects you deliver – to be part of the adapted and resilient built environment sector of the future.



People spend around 90% of their lives indoors; recent studies have shown that indoor air quality in modern airtight buildings with low ventilation rates can be harmful to well-being and health.



The University of Bath is a leading partner in **ECO-SEE**, developing low carbon eco-materials to deliver improved indoor air quality in energy efficient buildings. **ISO-BIO**, a four-year EU (Horizon 2020) project, is developing bio-materials for construction to improve energy efficiency. Their recent EPSRC-funded work on low carbon materials includes development of whole cork buildings and use of natural fibre insulation materials for refurbishment works.



Initial results from the **Materials4Life** project have been promising, with the development of a new generation of unique, versatile and robust self-healing construction materials that monitor, regulate, adapt and repair themselves. This project is delivered by Cardiff University, University of Cambridge and the University of Bath.



Work at the University of Leeds is exploring public and industry attitudes to the use of a range of optimised, natural and re-used materials. They've identified a range of drivers for current use of and barriers to more widespread application of sustainable and low-carbon materials, including lack of design knowledge and skills as well as negative perceptions. Ongoing work includes considering how industrial strategy can better support the integration of these new materials and low carbon design.





Building performance tools

In considering the implications of a warming climate, assessment of building performance is a critical exercise.



Current building thermal models use observed weather data to predict the internal conditions of a building. The University of Bath is developing future weather files to allow assessment of building designs to maintain comfort levels whilst reducing energy use.

The University of Bath's £1m ground-breaking building project, The Hive, is designed to support research into construction materials, heat and moisture impacts on building performance, flood and construction load.



Researchers from Oxford Brookes University have a particular focus on low-carbon building retrofits and evaluation of new building performance. These tools assess energy performance, occupant comfort and make comparisons with the performance targets set at the building design stage.



Flood risk



Flooding is a major threat to business. Small and medium-sized enterprises (SMEs) are particularly vulnerable as they are likely to be less prepared than large companies and have fewer resources to mobilise in response. The [SESAME project](#) has developed guidance to help SMEs consider how a flood would affect their business and plan across the different stages of a flood event.



Safety first: prevention through design



The global construction sector accounts for about 100,000 fatalities and far more injuries and illnesses annually, leading to huge costs to society. Poor design is a notable contributory factor to accidents, hence the prominence of design for safety and the Construction Design and Management (CDM) Regulations in the UK. | A novel web-based tool is being developed at the University of the West of England to enable designers to assess and improve their capability to create products that are inherently safe for contractors to build and maintain, and also safe for occupants to use.

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