

Saving lives through technology

An innovative project aims to reduce accidents and injuries on construction sites by using the power of BIM models to change behaviour in the way risks are managed, communicated and mitigated.

THE NEW ZEALAND construction industry has two key statistics that it should not be particularly proud of. The first is the continued high rate of accidents and injuries on construction sites, and the second is the slow uptake of new technology.

Reducing accidents and injuries

BIMSafe NZ, a 3-year \$1.7 million joint venture between the Canterbury Safety Charter and the University of Canterbury (UC) Building Innovation Partnership, will tackle these issues head on to reduce accidents and injuries through the communication, collaboration and visualisation powers of building information modelling (BIM).

The Safety Charter was established following the Christchurch earthquakes to improve health and safety capability and outcomes during the deconstruction and rebuild. The work of the charter in enabling collaboration between organisations who would normally compete was fundamental in raising construction health and safety standards in the city, resulting in zero deaths during the rebuild.

The Building Innovation Partnership at UC is tasked with improving the resilience, sustainability and economic performance of buildings and infrastructure. A key theme of this work is accelerating the digitisation of the building industry using data and digital technologies that improve decision making, coordination and communication.

Using technology to drive change

BIM sits at the heart of this project. A BIM model is a digital 3D representation of a project, which then becomes the single source of truth for all the project information.

The model is literally built from the ground up, with architects and civil, structural and service engineers all able to work collaboratively on a single model in the design stage, rather than in their traditional silos. The whole construction process can then be represented digitally in the virtual model world through time sequencing.

Health and safety by design

The other central component of this project is the health and safety by design process.

Designers in New Zealand are required by law to identify and mitigate construction health and safety risks in the design phase.

This process is well understood and undertaken in New Zealand as is the principle that it is more effective and cheaper to eliminate and mitigate risks during design rather than construction. However, these decisions and mitigations can become lost in the volume of paperwork associated with the procurement process. Workers who will be doing the actual construction or maintenance are not given the opportunity to contribute to design decisions that may affect their safety.

A BIM model enables all project stakeholders - clients, designers, contractors, subcontractors, health and safety managers, and even maintenance workers - to collaborate in the health and safety by design process. This means that the people who are going to undertake work on the project can share their knowledge and expertise with the design team and client about how best to manage and mitigate health and safety risks. These risks and mitigations can then be stored and communicated to others via the BIM model.

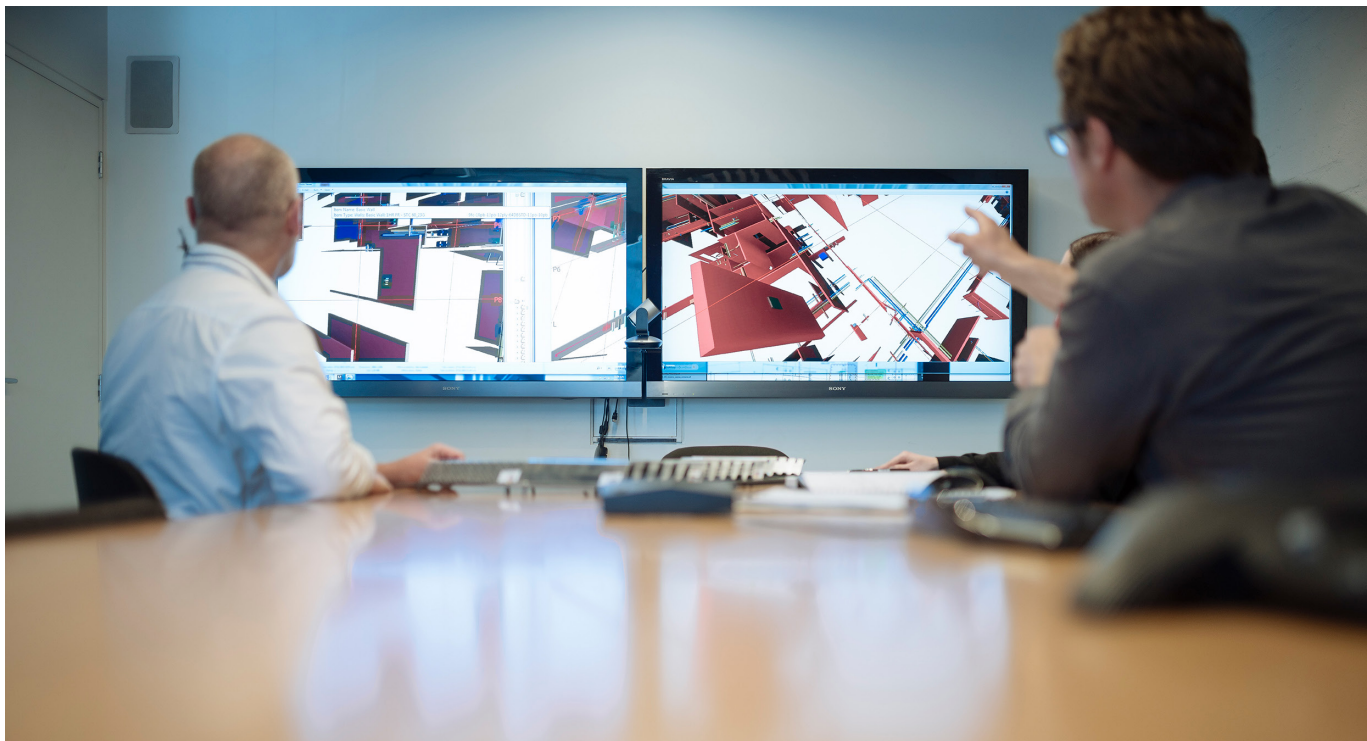


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Individual risks can be flagged, with details of the risk rating, mitigation strategy, responsibility and status. The BIM model enables the planning of safe egress and access, site traffic, lifting methodologies, exclusion zones, hazardous work and work processes.

The visualisation powers of a BIM model can then be utilised to enable workers to see the dangers of the work they are about to undertake and make real-time decisions about their own safety.

Could be a game changer

For the last 3 years, Brad Sara, Associate Principal at Warren and Mahoney and co-Chair of the Safety Charter’s Professional Services Working Group, has led the Health and Safety by Design Programme at Warren and Mahoney. ‘BIMSafe NZ has the potential to be a game changer in the way risks are identified, managed and communicated on New Zealand construction sites,’ he says.

‘Models and BIM processes are more available and commonplace through design and construction projects than they were 10, 5 or even a couple of years ago. They offer a

common single source of truth displayed in a medium that breaks down most language and socio-economic boundaries - if you can see it, it is real.

‘Being able to visualise a potential health and safety issue prior to it being real or being in the real environment, discuss and action mitigations and educate workers on the remaining risks will directly reduce New Zealand’s dire accident rates on our construction sites.’

Three key workstreams

The BIMSafe NZ Project has three workstreams. The first is the development of best-practice guidelines for integrating health and safety information into BIM models. These are set to be published in mid-2024.

The second is a case study of a construction project where the guidelines can be trialled and feedback provided to the author team prior to publication. The case study selected is the Ōtepoti building, which will provide new offices for ACC in Dunedin. It is designed by Warren and Mahoney with Ngāi Tahu Property and the ACC Investment Fund as the client.

James Jackson is the Development Manager at Ngāi Tahu Property. ‘As a values-led organisation and leading developer, Ngāi Tahu Property want to do everything we can to help the industry provide safer workplaces,’ he says. ‘Our expectation is that all project stakeholders will actively engage with the project, and we will see tangible benefits throughout the process.’

The third workstream will promote the project outcomes and encourage organisations in New Zealand to adopt the guidelines as an effective way of reducing accidents and injuries on construction sites. A series of video resources will be produced, and a nationwide roadshow will travel the country in late 2024.

‘The knowledge garnered from the BIMSafe NZ project through the guidelines, case study and technology is set to have far-reaching benefits,’ says Brad Sara. ‘Sharing this knowledge through education and engagement of the wider industry provides the opportunity to transform the construction sector and literally save lives.’ ◀

For more ▶ Information on the BIMSafe project is available at safetycharter.org.nz/bim-safe-nz.