

BRAC Report



BUILDING RESEARCH ADVISORY COUNCIL

This material is approved for general distribution to stakeholders.

This report is a snapshot of highlights from the March 2021 Council meeting and is not a full record of all the discussions that took place.

It is intended to be shared widely by Council Members and their nominating organisations.

March 2021

Welcoming new members

The Council welcomed five new members: Ewan Brown representing Te Kāhui Whaihanga New Zealand Institute of Architects (NZIA), Rohan Bush representing Kāinga Ora, Sanjesh Lal representing Registered Master Builders Association (RMBA), John (Johnny) Malthus representing Business NZ and Karl Wipatene also representing NZIA.

Industry Issues

One of the Council's roles is to inform BRANZ of industry issues that could require a research response. BRANZ tracks these issues over time. Discussions at the March 2021 meeting were wide ranging – reflecting the diversity of issues front-of-mind for industry. Three discussion items were raised;

- Members discussed there were opportunities, through the Building Act Amendment Bill, to place the onus on suppliers and manufacturers to make building product information more readily available to improve product reliability. A bar-coding system and database was suggested.

Work previously commissioned by BRANZ on the development of a national product catalogue is available [here](#).

Progress of the Bill and access to the relevant documentation can be found [here](#).

- The importance of alignment between the work programmes of BRANZ, Ministry of Business, Innovation and Employment (MBIE) and the Construction Sector Accord in a challenging environment. It was felt that while things were heading in the right direction, there was still more to be done.
- The significant work being undertaken by the Climate Change Commission. The Council commented that the support required to develop the ways to most efficiently meet climate change targets to minimise industry costs also needed to be identified.

Two members presented to the Council on their perspectives on what is happening in the sector:

- John Sneyd of MBIE, discussed two key programmes, the Building System Legislation Reform Programme and the Building Code Update Programme. John also provided perspectives on the Construction Sector Accord, Building for Climate Change and effectiveness in consenting.
- Ian McCormick the Building Control General Manager of Auckland City Council highlighted the impacts of growth in Auckland, and where there were opportunities for improvement.



Spotlight on Research

Three of BRANZ's research scientists presented to the Council.

Knowing Enough to Ask: The research practices of new build, residential clients during the construction of their new home.

The Council received a presentation from Orin Lockyer a Social Scientist at BRANZ on his project. Orin provided an overview of the findings for the residential, newbuild client, research at BRANZ. The research is centred on the types of knowledge clients bring into the build process, how clients communicate with the building industry, and how satisfied clients are with their builders.

The research showed that clients are aware of how difficult it is to research building a home, so tend to focus their research on identifying the reputation of their chosen builder. Clients who had access to impartial expertise felt more comfortable challenging their builder and were more likely to go beyond standard specifications.

Overall, the research found that the informational needs of clients are increasing, and the current building system is not necessarily conducive to increased client involvement. COVID-19 has had a significant impact on new build clients. 55% of clients who took part on the New House Owners Satisfaction Survey, said that COVID-19 had a moderate and major impact during their build. These findings correlate with a significant drop in client satisfaction in 2020 compared to previous years.



In situ Efficiency of Heat Recovery Systems

Research scientist Aidan Bennett-Reilly spoke about the efficiency of Mechanical Ventilation with Heat Recovery (MVHR) in retrofit. Performance of MVHR can be effective in the right circumstances. In one system tested, the heat recovery core (crossflow) recovered 70% of the heat. When the ducting was introduced (outside the thermal envelope in a roof cavity), only 40% of the total heat was recovered. Therefore, warm side ducting (i.e., between the insulation and the ceiling) should be installed within the thermal envelope, or well insulated and kept short to reduce heat loss. Supply and extract air flows should be balanced to prevent driving infiltration or from makeup air. Commonly closed off areas (e.g., bedrooms at night) are recommended to have their own supply and return vents to avoid driving infiltration/exfiltration.

Benefits are more pronounced in high performance buildings and lower performance buildings would be better suited to improving the building performance before using a heat recovery system. In addition, the efficacy of a heat recovery system is best when the whole building is heated, otherwise it can cause ventilative cooling of spot heated areas.

Engineered Wood Products in New Zealand: Trends, Perceptions and Resources

Senior Structural Engineer David Carradine presented a project aimed at understanding the appetite for engineered wood products (EWPs) in New Zealand buildings and existing perceptions about them. This project was developed based on global indications that using more timber in buildings and creating larger timber buildings are potential ways of reducing greenhouse gas emissions and sequestering more carbon. Dissemination of the project findings included a [webinar](#) which presented a wide range of resources currently available in New Zealand that can educate and inform the building sector about using EWPs. These resources were discussed with the aim of helping those who want to know more about EWPs and how to effectively incorporate them within lower carbon building projects. Analysis of the approximately 500 webinar registrants helped provide a better understanding of the audience and potential building sector players who are seeking this kind of information. This is helping develop stakeholder profiles for future projects at BRANZ where low carbon building options are being investigated.

Research in action

With the Council meeting being held at the BRANZ site, the Council was also able to take the opportunity to see first-hand some of the research projects underway.

Materials Scientist Anna Walsh gave an overview of the research underway with Structural insulated panels (SIPs) looking at durability, seismic and fire performance.

New Zealand has an urgent need for quality housing that can be built quickly and affordably. Construction using SIPs has been suggested as one possible solution. Although SIPs have been used overseas for several decades, less is known about their performance in New Zealand conditions and in the context of our Building Code.

BRANZ is taking a multidisciplinary approach to SIPs by investigating how they perform under New Zealand's climate and in the event of an earthquake or fire. Experimental work so far has involved accelerated ageing of SIPs samples to understand their long-term performance. Work to test SIP wall bracing systems under seismic load to see how they perform in an earthquake.



Small-scale SIP samples in climate chambers for accelerated ageing



One of the 3 direct PV systems being assessed. It shows some of the complexity associated with the research setup. Where water temperature stratification, water and energy flows, and datalogging has to all be carried out in a controlled manner.

Stephan Rupp, a Building Physicist, introduced the Innovative Low Carbon Residential Water Heating Solutions Project. It is estimated that New Zealand has approximately 1.5 million households, each requiring some form of water heating – whether instantaneous or stored. The original BRANZ Household Energy End-use project found that 88% of all domestic water heaters comprised of storage tanks heated with a simple, temperature controlled element – a century-old technology. Given the advances in domestic water heating, this is an area ripe for improvement, especially given its significance in terms of ongoing household energy costs and carbon emissions.

There are several new innovative residential water heating technologies that show promise to greatly reduce the carbon/energy/lifetime costs of the more traditional systems. BRANZ research is focusing on three water heating systems which utilise photovoltaic (PV) energy, assisting grid electricity when needed. As comparisons, a traditional water heating storage tank (representing the 'typical' technology) and an air-to-water heat pump (representing the 'best' technology) will be tested and analysed alongside the PV systems. Seasonal tests will be carried out, to better understand year-round performance and utility, based on a variety of draw-off profiles mimicking households. BRANZ intends to provide analysis on the various technologies, in terms of the magnitude of carbon/energy/money savings realistically possible. The results will be available mid-2022.