



LEVY IN  
ACTION 2018  
- ADDENDUM



# FOREWORD

Research needs are dynamic and ever-changing. BRANZ has processes through which it calls for, and awards, research to receive Building Research Levy funding.

It is about doing the right research at the right time and that means BRANZ remains open to conversations around any new out-of-cycle opportunities throughout the year.

This addendum to the 2018 Levy in Action outlines new investment in 2018/19 that has been secured outside of the timeline for the publication.

As part of its portfolio approach BRANZ calls for research through the Building Research Levy Prospectus. The Prospectus seeks proposals from the wider research community to help deliver on research priorities. At the time the Levy in Action was published, the

2018/19 Prospectus round had not been completed. It was signalled that the investment decisions made through the round would be published as supplementary information to Levy in Action. This document now outlines new research that will address the research priorities.

A number of out-of-cycle proposals have also been awarded funding to respond to emerging issues within industry. BRANZ recognises the importance of being an agile investor, able to respond to opportunities and issues outside the annual cycles. These out-of-cycle investments can come from ideas identified and developed within BRANZ or from external organisations. Details of these projects are also included here.

# BRANZ BUILDING RESEARCH LEVY PROSPECTUS – NEW INVESTMENT WITH EXTERNAL PROVIDERS

There is significant expertise within universities, CRIs and independent research providers. Working in partnership and collaborating with other providers is an important part of how BRANZ strives to deliver best value from the Levy for New Zealanders. Primarily BRANZ Inc. seeks out external proposals through the publication of a research Prospectus.

In 2018/19 the BRANZ Building Research Levy Prospectus sought research to address the following research priorities:

- » Compliance and assurance for building manufacturing: supporting New Zealand to develop approaches that can support compliance and assurance for manufactured buildings.
- » The potential of Blockchain – information management in the construction industry: helping us begin to understand where and how Blockchain technology could change the construction industry.
- » The potential of Blockchain – product assurance: helping us begin to understand where and how Blockchain technology could provide new solutions and approaches to product assurance.
- » What can the vertical construction sector learn from horizontal infrastructure: helping us test the view that the infrastructure sector approach to risk sharing in procurement and contracting is helping drive positive behaviours. If valid, provide insights to see if there are lessons that could be applied to the vertical part of the construction industry.
- » Growing investment in innovation and development: providing evidence around current levels of investment in research and development taking place in the building and construction industry, any barriers to investment and potential solutions to these. (new research still under negotiation at the time of publication)

Here are details of the additional new research projects in 2018/19 allocated through the BRANZ Building Research Levy Prospectus round.

## Compliance and Assurance Prototypes for Manufactured Buildings

To meet the KiwiBuild programme targets of quality and affordability, manufacturing in construction could offer potential solutions however it will need an instrumental regulatory environment supporting assurance and compliance for manufactured buildings.

This project aims to provide evidence-based research to support compliance and assurance for manufactured buildings. It will examine the challenges of compliance and assurance that the MBIE, Building Consent Authorities, building manufacturers and builders face in regard to using fabricated products and systems. It will look to develop new assurance and compliance prototypes by drawing on lessons learned from other countries and best practice from the manufacturing industry.

While New Zealand is increasingly exploring greater use of manufacturing in construction, the sector will benefit from a more robust and supportive regulatory environment for adoption of alternative building solutions.

<b>Levy investment</b>	\$50,000
<b>Timeframe</b>	July 2018 - June 2019
<b>Contact</b>	yan.chang@auckland.ac.nz
<b>Lead organisation</b>	University of Auckland

## Chip off the NEW Block: How to Use Blockchain in the Construction Sector

There is a lot of hype around Blockchain. In many sectors spanning Shipping, Law, the Arts and Finance, entrepreneurs, scholars and researchers are looking at Blockchain's implications and exploring where and how it might be applied. Early adopters like Maersk, the international shipping company, are demonstrating how it can streamline complex business processes.

How can Blockchain help construction? An industry must first understand a new technology before it can make informed decisions about where it can add value. This is the first challenge of Blockchain—understanding what it is and what it can do for the industry.

Working with construction industry stakeholders the researchers will look to understand Blockchain, its potential and identifying where it can be applied to the industry. The project will develop industry resources for Blockchain as well as target specific cases where researchers will work with stakeholders to implement Blockchain to test its viability.

<b>Levy investment</b>	\$171,490
<b>Timeframe</b>	November 2018 - October 2020
<b>Contact</b>	d.mcmeel@auckland.ac.nz
<b>Lead organisation</b>	University of Auckland

### Applying Blockchain to Product Compliance and Assurance

This project evaluates the prospective use of Blockchain for product assurance and compliance in construction industries. There have been multiple cases of imported construction products, being non-compliant and failing in-situ. BRANZ (2017) estimates this costs New Zealand up to \$232 million. This not only affects productivity, but also has health and safety risks to New Zealanders.

To evaluate Blockchain, this research will investigate product assurance practices, the data needs associated with assurance and availability of verifiable electronic information, here and offshore (China/Australia). It will undertake a comparative analysis of attempts to apply Blockchain in the healthcare and food sectors to bring these lessons into our assessment.

Using these findings and a Blockchain assessment methodology, the research will conclude whether Blockchain is the best technology choice to drive and support product assurance and compliance in the New Zealand construction industries.

<b>Levy investment</b>	\$178,875
<b>Timeframe</b>	September 2018 - July 2019
<b>Contact</b>	nick.allison@gs1nz.org
<b>Lead organisation</b>	GS1 New Zealand

### Risk Management Strategies

This research aims to improve the productivity of the vertical construction sector through enhanced risk management and organisational resilience processes. The recent success of horizontal infrastructure projects such as Northern Toll Road Gateway, Waterview Project and Christchurch Infrastructure Recovery contrast with ongoing challenges faced by the vertical construction sector and hence present a unique opportunity for cross-sectoral learning.

System dynamics models will be developed to clarify key structural commonalities and differences between the two sectors, as well as strategic opportunities for enhanced risk management and resilience interventions. These models will be validated and extended through expert workshops. By promoting enhanced risk management strategies and resilience practices, it is anticipated that a more productive, higher quality and more stable vertical construction industry contributes to improved socio-economic well-being in New Zealand.

<b>Levy investment</b>	\$191,000
<b>Timeframe</b>	September 2018 - September 2020
<b>Contact</b>	charlotte.brown@resorgs.org.nz
<b>Lead organisation</b>	Resilient Organisations Ltd

# BEING AN AGILE INVESTOR – TACKLING PRESSING NEEDS

As part of its portfolio approach, BRANZ understands the importance of being an agile investor, able to respond to opportunities and issues outside the annual funding cycles. BRANZ responds quickly to emerging industry issues and invests in discrete pieces of timely work such as a publication or guidance on a pressing issue.

Here are details for new out-of-cycle research projects in 2018/19.

## Facilities Management Industry Census

This research will deliver a New Zealand census of the Facilities Management industry. Facilities managers have an influence on quality building design and on-going building maintenance, a key factor in maintaining building quality. An opportunity arose to work with the Facilities Management Association of New Zealand to better understand the Facilities Management industry.

The research will aid informing and advising facilities managers on how to build and maintain for quality, with the potential to lead to an overall reduction in quality issues for New Zealand buildings.

<b>Levy investment</b>	\$30,000
<b>Timeframe</b>	April 2018 – November 2018
<b>Contact</b>	anne.duncan@branz.co.nz
<b>Lead organisation</b>	BRANZ Ltd

### Identifying the Trends: Working Towards Suicide Prevention for the Construction Industry Workforce

The New Zealand construction industry has the highest numbers of suicides of any industry in the country. The recent BRANZ study report SR411 Mental Health in the Construction Industry highlighted that better understanding of the high number of suicides is both urgent and important. In Australia, the high rate of suicide in their construction industry has been well recognised for over a decade and research has helped to inform prevention programmes. At present, we know little about suicide in the context of New Zealand’s construction workforce. As a result, it is difficult to make informed decisions about what form prevention activities should take, and how they should be carried out.

This research aims to help remedy this situation by identifying trends associated with suicide in the New Zealand construction workforce. Through a systematic content analysis of coroners closed case files this work will establish demographic and social trends linked to construction worker suicides.

<b>Levy investment</b>	\$90,000
<b>Timeframe</b>	September 2018 – March 2019
<b>Contact</b>	CStachowski@sitesafe.org.nz
<b>Lead organisation</b>	Site Safe NZ

### Planning Barriers for Prefab

Prefabricated housing has been identified as a key enabler to increase the timely supply of quality housing across New Zealand. At the same time, it reduces waste, energy and greenhouse gas emissions compared to traditional onsite construction methods.

This research assesses whether prefabricated housing is treated differently to non-prefabricated housing in district and city plans across the country, to identify whether additional planning barriers for prefabricated housing exist. It will then identify specific actions to overcome any such planning barriers. It is timely to identify any barriers for prefabricated housing in our planning system, along with actions to overcome these barriers.

This research will raise awareness of any planning barriers to prefabricated housing and incentivise the actions necessary to convert these barriers into opportunities. It will support improvements in planning processes and increase the ability of prefabricated housing to meet the growing demand for quality housing nationwide.

<b>Levy investment</b>	\$99,300
<b>Timeframe</b>	October 2018 – February 2019
<b>Contact</b>	toni@planalytics.co.nz
<b>Lead organisation</b>	Planalytics NZ Ltd

## ReCast: Seismic Assessment and Improvement of Existing Precast Concrete Floors

Buildings with precast floors comprise a large percentage of the commercial building stock in all New Zealand cities, with a significant proportion of commercial floor area in major centres falling in this category. New Zealand's widespread use of precast floors in regions of high seismicity is unusual worldwide. Consequently, there is little international research that informs the expected performance of these floors. This is "New Zealand's problem", highlighted by failures seen in Statistics House after the Kaikoura earthquake.

If measures are not taken to address known performance deficiencies, multiple floor collapses should be expected during earthquakes generated by the Wellington fault or Hikurangi subduction zone. This research will develop a 'New Zealand Inc.' approach to this national problem, form a coalition of researchers and engineering practitioners to develop solutions, and provide clear and frequent communication to the building industry. It builds on previous work lead by MBIE and a Working Group that drafted guidance in the short term that engineers can use: *The Seismic Assessment of Existing Buildings - Technical Guidelines for Engineering Assessments*, July 2017.

Engineers now need direction on retrofit approaches to address vulnerable buildings. Furthermore, questions remain unanswered about assessment of precast floors and further research will help improve the implementation of the guidelines developed by the Working Group. The Working Group has developed a list of research issues that need to be addressed to more fully inform the guidance and provide retrofit solutions in the medium term.

<b>Levy investment</b>	\$1,053,161
<b>Timeframe</b>	June 2018 - March 2021
<b>Contact</b>	k.elwood@auckland.ac.nz
<b>Lead organisation</b>	University of Auckland

## Scoping Research Requirements for Engineered Wood Products

The past two decades have seen a significant global increase in the use of timber products within the built environment. Most of this increase is attributable to engineered wood products (EWPs), from large-scale structural elements through to non-structural and decorative components used on the interior and exterior of buildings. New Zealand has an urgent need to supply new housing stock, with clear signals for significantly increased use of EWPs.

This scoping project will gather information regarding the use of EWPs across the building landscape, from acceptance and design through to delivery. It will assess both the current and future growth of EWPs use in New Zealand housing, and identify where research is required to support increased utilisation of EWPs in building practice relevant to New Zealand.

<b>Levy investment</b>	\$120,000
<b>Timeframe</b>	August 2018 - May 2019
<b>Contact</b>	david.carradine@branz.co.nz
<b>Lead organisation</b>	BRANZ Ltd

# SCHOLARSHIPS

Each year, funding is made available for outstanding postgraduate scholars in New Zealand tertiary institutions. The aims of the scholarship programme are to add diversity to BRANZ’s portfolio of investments, support future research and strengthen BRANZ’s relationship with tertiary education.

The scholars must show how their research will inspire the building and construction industry to provide better buildings for New Zealanders. Scholars with outstanding academic credentials and early-stage researchers pursuing innovative projects can apply for scholarships of up to \$25,000 a year for three years. Typically, Master’s students gain one year scholarships and PhD students three-year terms.

These are the two new out-of-cycle postgraduate scholarships under way:

**Beth Noble**

**Artificial Lighting Systems that Meet the Needs of Autism Spectrum**

Beth’s research builds on her Master’s thesis that showed that artificial lighting was a significant cause of discomfort, distress and avoidance in people on the autism spectrum. It investigates why artificial lighting has a greater effect on people on the autism spectrum; what is it about artificial light that causes the negative effects – colour spectrum, brightness, directionality?

She aims to understand the implications of how lighting is designed in the built environment, particularly the implications of the shift towards LED lighting which has a different set of parameters to fluorescent? And from these, how can lighting systems be designed to be more accessible to people on the autism spectrum?

Timeframe	To be completed by October 2021
Contact	research@branz.org.nz

**Jarred Butler**

**Impact of Occupants on Mould Issue in New Zealand Bathrooms**

Jarred’s research aims to test if the ventilation (and possibly heating) strategies that are being used are sufficient to prevent mould from forming in New Zealand residential bathrooms. The research will determine what, if any, changes need to be made to these ventilation strategies.

Timeframe	To be completed by July 2019
Contact	research@branz.org.nz



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