



**Annual
Review**
2019





Inspiring the industry to provide better buildings for New Zealanders

Professor Juliet Gerrard visiting BRANZ's research and testing facilities in February 2019. Professor Gerrard is the Prime Minister's Chief Science Advisor and is seen here with BRANZ CEO, Chelydra Percy, and BRANZ staff.





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With the BRANZ Chair and CEO



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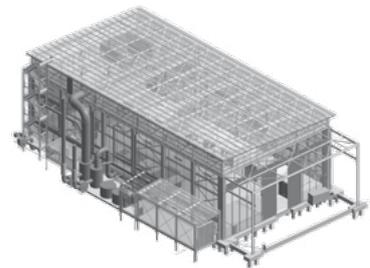
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Thank you



A conversation on change

Five years ago, the BRANZ Board, Board Chair **Dr Helen Anderson** and newly appointed CEO **Chelydra Percy** led out a fresh strategy for BRANZ.

It followed a difficult time, with the Building Research Levy-funded organisation under pressure to help improve an industry widely perceived to be failing. Now, on the cusp of the next new strategy, the pair sit down with journalist and commentator **Vincent Heeringa** to reflect on a time of tumultuous change and their ambitions for BRANZ and the industry.



Vincent Five years doesn't seem that long ago, but a lot has happened in the industry – and indeed the country. Looking back, what were the challenges then?

Helen What I remember most was that the industry was described as a cot-case. The Productivity Commission was taking a close look at it because it seemed stuck in a boom-bust cycle, there was the wallboard issue, there were skill shortages, there was fallout from weathertightness. And the fact that there are a huge number of small builders in New Zealand meant it was regarded as a craft industry rather than a professional one. Overall, a pervasive sense existed that a silver bullet needed to be found really quickly to fix it all.



Dr Helen Anderson
Chair



Chelydra Percy
Chief Executive Officer

Chelydra Add to that the impact of the Canterbury and Kaikōura earthquakes. This caused an immediate boom.

Boom times are great, but the immediacy and urgency of these demands began to expose all the problems in the industry. This was a time when there was not a lot of trust between the industry and the general public. People were worried about quality issues. They were worried about leaky homes. There was a lot going on.



Vincent Heeringa is a writer and publisher with a strong interest in science and communication. He has degrees in biochemistry and economic history, was chair of the Science Media Centre, co-founder of *Idealog* magazine and remains a champion of New Zealand design and innovation.

Vincent **And what about BRANZ – it wasn't immune from those criticisms, right? What were your challenges five years ago?**

Chelydra BRANZ was at a crossroads. There was confusion about who we were and what we did. We have this amazing opportunity as stewards of the Building Research Levy, which we can use powerfully to help everyone in the industry. But people were confused about our role. Were we a regulator? Were we working for or against the industry? What was our role in providing testing services? In driving innovation?

Vincent **How did you respond?**

Helen The first thing we did was set about to clarify what we did and didn't do. We expressed that in a set of principles. For instance, independence and impartiality are fundamental for us. So is transparency. The Levy comes to us from people who do building work directly for the people who pay the Levy. With that Levy, we have a responsibility to do the work that can make the most difference for people. And we need to be able to show what New Zealanders get for that money. We're also strong on being able to demonstrate the robust evidence behind our research findings and recommendations.



We are very clear that we are not advocates for the construction industry; we provide the evidence that can underpin important decisions needing to be made by the building sector.

Chelydra Another principle we adopted was to ensure our information was readily accessible and actionable. So, when we commission research, we insist it focuses on how it will make a difference to people through the building system. We don't do research to produce a report that sits on a shelf in someone's office or only gets referenced in a white paper or article. We are determined to deliver impact on the ground.

Vincent **They sound like excellent principles. But what did they mean in practice? Can you give me some examples?**

Helen Well, we did some cool things. After the Christchurch earthquake, people were concerned that some types of school buildings such as classrooms and gymnasiums were prone to earthquake damage. So, we got a school and pulled it apart, subjecting it to some pretty severe shaking. We ended up being able to demonstrate that these facilities were not as earthquake prone as some people feared. The greater accuracy of these seismic assessments meant that this work saved the Ministry of Education significant expenditure that could be better used elsewhere.

Chelydra And once we were clear about what we would do and wouldn't do, we started working with industry in a different way. We went out and listened more. We became more determined to learn and understand exactly what the industry needed. We started partnering more with industry, bringing industry into our research planning and information fold. We found better pathways to make our research findings more accessible for end users through practical information and tools for the worksite.

For example, we are now poised to achieve big productivity savings with Artisan a quality assurance tool we have developed for use on construction sites as part of the building inspection process.

Builders will upload photos of their work via the app, and the council officer can inspect this work virtually. Auckland Council has now begun to roll Artisan out with their build teams, knowing they will go from needing only three of the (on average) 13.5 inspections required to be physical on-site inspections. This is a huge productivity saving for the council and for the build teams.



Vincent **Health and safety have been big drivers of change too, haven't they?**

Helen Now, that all came out of Pike River at some level, and this industry is really challenged at delivering meaningful health and safety results. So, we've been determined to model that ourselves and to hold other people to account.

Chelydra Now health and safety are a major focus for the industry. And here's another example of how our independent research can add value. After the new Act came into force, new scaffolding regulations and guidelines were published. Builders were really concerned about the impact these would have on productivity. So we did two studies, 18 months apart, to check the impact. It was surprising. Initially, it

looked like the new regulations were cost neutral. But after 18 months of helping the industry work through it, it became clear that the new scaffolding regulations were driving safer and actually more productive worksites. We were able to show it was a real win-win outcome for both the regulators and the industry.

Vincent Providing tangible resources to meet real and topical problems that the industry grapples with is something BRANZ clearly does well. But how do you exercise leadership across such a diverse sector? Have you taken a lead role on any broader issues?

Helen Good question. Because when we've gone out and checked in with industry leaders and stakeholders on what they want more of from BRANZ, they consistently say BRANZ has to take on a greater leadership role.

But what does that actually mean? After all, there are many players in the sector and at least about 120 organisations that could potentially claim a leadership role.

So, we've done some hard thinking on how BRANZ can uniquely contribute and picked up on elements of the World Economic Forum's work on how the construction industry can transform and why transformation is so urgently needed. Our thinking helped us unleash the Industry Transformation Agenda that was launched in 2017. It's been exciting to see that this work has catalysed a number of transformative initiatives within the sector.

This year, for example, we have seen the advent of the Construction Sector Accord. This is a shared commitment between Government and industry to transform the construction sector.



What excites me about our BRANZ leadership work is that it is taking a system-wide view of the industry. It's a view that acknowledges that no one silver bullet will fix the sector. Rather, it focuses on what will make the building and construction sector a truly high-performing one. And it means, for BRANZ, that we can support the Accord, strengthen "systems thinking" skills and continue to unlock more courageous conversations across the sector. In fact, a whole lot more!

Chelydra

Yes, I think this is where BRANZ has been exercising a valuable leadership role in the sector. We've been facilitating conversations between industry leaders on the future of the industry. And we found there has been a real hunger to talk about what's needed and begin to act on what's possible.

For example, one sensitive issue we raised recently, before the industry seemed especially aware of the problem, is mental health. Suicide rates are alarmingly high in the industry, which is very concerning. So, we began to gauge how willing the industry was to address the issue, and we've been overwhelmed by the response. We're continuing to do further work to inform ways to address this issue. It's been great to see how openly our guidance is received and our material is used. And also the honesty of some very tough discussions taking place right now from the boardroom to the workplace.

I don't think we could have had these conversations a few years ago – at least not with such openness, respect and trust at the table.

And it makes such a positive difference to how we can deliver value. For example, leading local authorities and building companies quickly stepped up to collaborate on the evolution and testing of Artisan. This was a clear vote of confidence in BRANZ as a credible, trusted and safe partner in unknown technology territory.

Vincent **I'm a rather hopeless amateur builder myself. But I get incredible satisfaction from my handiwork. It must be quite pleasing to see your work being used in a practical way, a way that affects people's lives.**

Helen Absolutely! I love being involved with BRANZ. I like the fact that our people are doing stuff that matters. They're creating long-lasting assets for the country that can change people's lives. I'm a seismologist, and I've been involved with some of the enquiries into building collapse. I really care about having quality buildings and keeping people safe.

So, my passion is also about making sure this industry really steps up. It's a deeply complex industry with complex challenges, which is also part of the challenge and satisfaction I get from BRANZ. If there was a single silver bullet to improve and transform this industry, someone would have found it by now. It's great to be part of the team that is determined to wrestle with issues that matter to so many people.



Chelydra Yes, I agree.

Our BRANZ team is amazing. I've never walked into a research organisation before where you could immediately feel the passion people have for solving an industry's problems. I have worked in many science and research organisations, and this commitment and dedication was a huge drawback for me initially. But I have since had several personal experiences that make me aware just how much more needs to be done for New Zealanders and their homes.

For example, when I and my family moved back to Wellington for this job, we discovered our youngest son, who has never been unwell in his life, was diagnosed with asthma. What he had was 'unhealthy home syndrome'. As soon as we insulated and got our damp house warmer and drier, his problems disappeared.

Now, I am acutely aware, from the work that BRANZ does, that unhealthy homes are a significant cost for this country – on the health system, on education, on the economy and on personal lives. Anything we can do to make homes and buildings and schools operate in better healthier ways has to be good. I totally get why our BRANZ team is so passionate about making a difference.

If you look at the impact of BRANZ's work, just through the lens of this past year, you can see that passion coming through loud and clear. It drives everything we do.



Changing lives

Chelydra

*WHEN WE COMMISSION RESEARCH,
WE INSIST IT FOCUSES ON HOW IT WILL
MAKE A DIFFERENCE TO PEOPLE
THROUGH THE BUILDING SYSTEM.*

Providing evidence-based solutions to improve lives and strengthen communities in a time of rapid change.



Making homes healthier for New Zealanders

There is robust evidence to show that small improvements in housing can significantly improve the health and wellbeing of occupants. And improvements are urgently needed if we are going to reverse the trend of New Zealand leading the developed world in statistics such as highest rate of excess winter mortality.

Small changes to the way we heat, insulate, ventilate, build and maintain our homes can create significant positive changes to the lives of many New Zealanders. The way we shape our built environment also has the ability to strengthen families and communities. This year saw leaders, policy makers, and influencers using BRANZ's robust research to drive real improvements in the environments where New Zealanders live, work and learn.

Improving rental home conditions

In February 2019 the Government announced the healthy homes standards. These new standards for heating, insulation, ventilation, draught-stopping, drainage and moisture control in rental housing will make a significant change to the quality of New Zealand rental homes. They will improve the wellbeing of New Zealanders and their families by making rental properties warmer, drier and healthier for the nearly 600,000 households that rent.

Underpinning these standards was a robust evidence-base built on research that included BRANZ's House Condition Survey. For two decades BRANZ's House Condition Survey has been building a picture of the state of New Zealand homes. This picture has been a driver of successive governments' efforts to improve New Zealand's rental housing stock. →

Chelydra

I AM ACUTELY AWARE. FROM THE WORK THAT BRANZ DOES. THAT UNHEALTHY HOMES ARE A SIGNIFICANT COST FOR THIS COUNTRY: ON THE HEALTH SYSTEM. ON EDUCATION. ON THE ECONOMY AND ON PERSONAL LIVES.

ANYTHING WE CAN DO TO MAKE HOMES AND BUILDINGS AND SCHOOLS OPERATE IN BETTER, HEALTHIER WAYS. HAS TO BE GOOD.

Results from the 2015 survey, released in 2017, showed that rental properties are more likely to be older and of poorer quality than owner-occupied homes. These cold, damp and mouldy homes contribute to health issues such as respiratory conditions and toxic reactions that can be avoided, as shown in research work undertaken by BRANZ and other researchers. Work from BRANZ's *Warmer, drier, healthier buildings programme* provides easily implementable solutions that improve the control of heat, air, moisture and contaminants in houses.

Both the House Condition Survey and research from BRANZ's *Warmer, drier, healthier buildings programme* helped in the development of the new standards now embedded in the Healthy Homes Guarantee Act 2017. These new standards are undoubtedly improving the lives of many New Zealanders.

MORE INFORMATION

www.branz.co.nz/hcs

Driving better decisions for all

In 2018 Statistics New Zealand drew on the expertise of BRANZ researchers to support the development of a new national dataset on the health of our homes.

Learnings gained from the BRANZ House Condition Survey supported the development of new Census questions about housing quality and heating. One question included in the 2018 Census collected information about dampness and mould in homes. Another new question focussed on home heating, including types of appliances rather than just the sort of fuel used. This recognises that different types of appliances using the same fuel can have quite different effects on energy demands, heating costs and health. This information will be critical to developing better policy and solutions to improve the health and wellbeing of New Zealanders.

Nationally, the new data will help many organisations, including BRANZ, to better understand building quality and living conditions in homes. It will be used to help assess housing quality issues and measure housing deprivation. The data will feed into the legislative requirements of councils, inform public health action and help target resources to those who need it most.

MORE INFORMATION

www.branz.co.nz/hcs

› The difference we make



Providing practical tips for healthier homes

A partnership with Consumer NZ put practical tips on how to make homes healthier and more comfortable over winter in the hands of 110,000 Consumer magazine readers.

Consumer magazine's 2018 June/July issue featured a 30-page "Winter Warmer" guide. BRANZ's research underpinned this magazine feature which showed readers how they could easily make their homes healthier and more comfortable over the winter months.

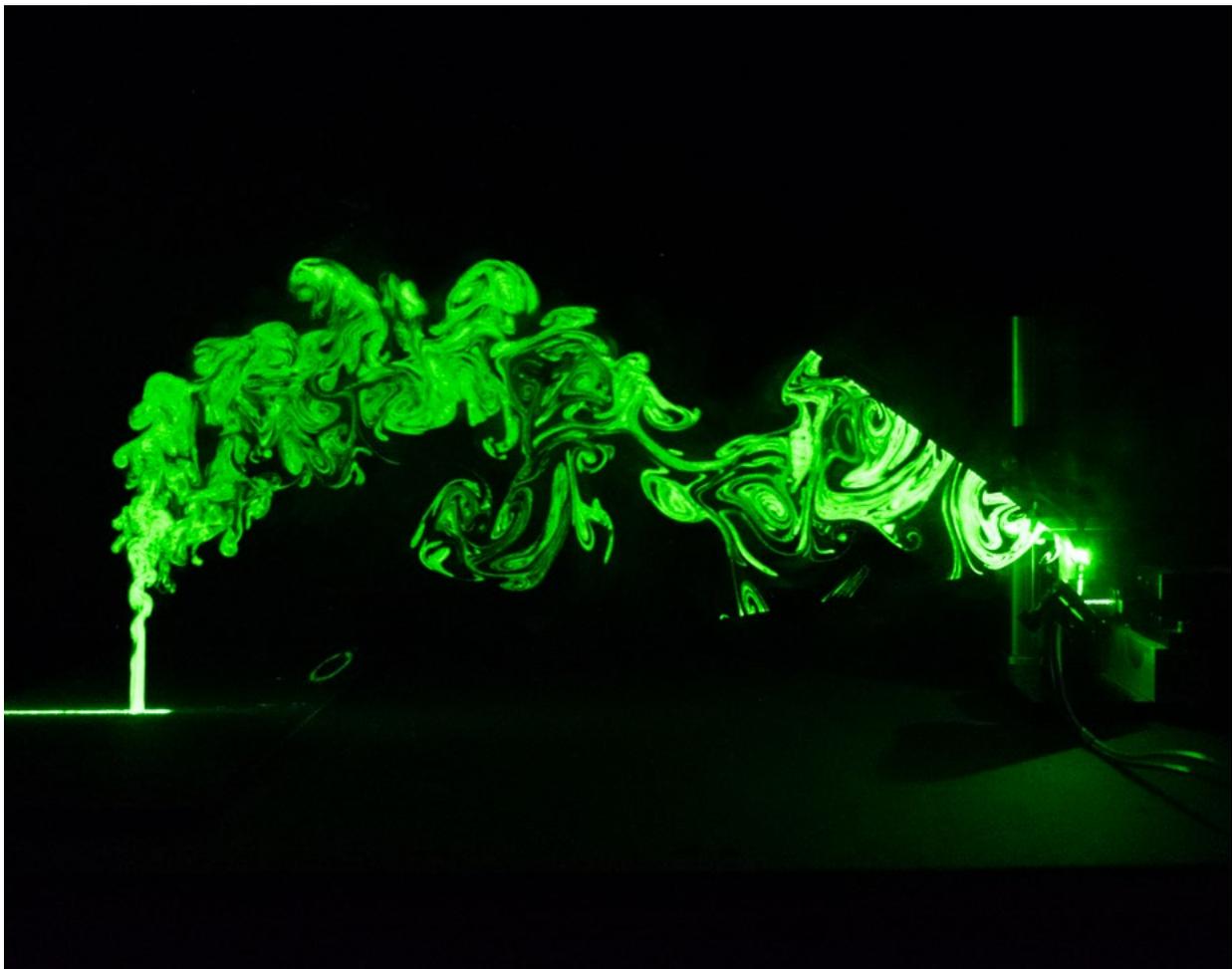
The feature gave readers practical advice on how to fit insulation, reduce dampness, get good ventilation and choose the most effective heating option for their home. The advice was backed by evidence amassed through BRANZ's long-term *Warmer, drier, healthier buildings* research programme and its House Condition Survey of New Zealand housing stock.

As well as being in *Consumer* magazine, the information remains available on the Consumer NZ website, which gets more than 300,000 visits per month.

This collaboration with Consumer NZ armed everyday New Zealanders with evidence-based solutions that could improve the quality of their housing and quite literally change their lives for the better.

MORE INFORMATION

www.consumer.org.nz



Demonstration of air flow through ceiling penetration at the mean ceiling-roof cavity pressure difference of 1.2 Pa using smoke and LED light.



Learning alongside iwi

With the support of Tu Kotahi Māori Asthma Trust and Kōkiri Marae, BRANZ researchers were privileged to learn and share knowledge with whānau about the factors that influence air conditions in their homes.

The mission of Kōkiri Marae is

*Ka haere tonu akoranga
o rātou mā, mo ake tonu āke
The teachings of those that
have gone on, will go on forever*

Based in Lower Hutt, Kōkiri Marae is well known for establishing and piloting new initiatives that support its mission, making it an ideal partner for this research initiative. This included the temperature, relative humidity,

ventilation behaviour and potential fungal metabolites being measured in the homes of 26 of the whānau of Kōkiri Marae during winter. The whānau also shared information on how they ventilated and heated their homes.

BRANZ researchers met with whānau to discuss the findings and share information on improving the indoor air conditions of their homes. Participating whānau were generous with their feedback on how they felt the study went and what could be improved for similar studies in the future. The learnings and insights shared by BRANZ researchers and Kōkiri Marae will help both to create teachings to enhance the health and wellbeing of whānau.



BRANZ SCHOLARSHIP SPOTLIGHT

Mould in New Zealand bathrooms

Jarred Butler, Victoria University of Wellington, Master's

Jarred's research aims to test if the ventilation (and possibly heating) strategies being used by New Zealanders are sufficient to prevent mould from forming in residential bathrooms. It will determine if any changes need to be made to these ventilation strategies.



Inspiring new thinking about housing

The New Zealand Productivity Commission's 2015 report *Using land for housing* stated "Housing is fundamental to our economic and social wellbeing. It plays a central role in individual and community health, family stability and social cohesion."

As a country we continue to grapple with housing affordability issues, declining rates of home ownership, increasing urbanisation and challenges with the availability of good quality rental properties. The work of BRANZ and other researchers continues to challenge and inform the thinking around how to improve access to quality, affordable housing that can strengthen families and revitalise communities.

Enabling the growth of medium-density housing

The growth in medium-density housing (MDH) building consents shows that this form of housing continues to be an important part of the response to both the housing needs and preferences of New Zealanders.

BRANZ's medium-density housing (MDH) programme aims to give industry the skills to deliver MDH that meets the needs of New Zealanders. Over the past two years, the MDH programme has carried out research that examines both the technical and the liveability aspects of building new MDH. →



Helen

THE SECTOR HAS TO THINK DIFFERENTLY ABOUT HOW WE WILL LIVE IN COMMUNITIES IN THE FUTURE.



Providing Tools for MDH

BRANZ-funded research released in 2018 looked at how to define what constitutes good-quality MDH. The research resulted in two assessment tools – one focused on developer input and the other on residents’ experiences.

Used together, these two tools give developers an integrated picture to consider what does and doesn’t work in their design. It also provides data that compares what the developer believes they have achieved with the views of the residents themselves on what has been successful.

Such tools provide developers, designers, government and industry with information that helps plan, design and build future developments that are liveable, sustainable and healthy for residents, and acceptable to surrounding neighbours.

These tools, along with other tools and information, are available on a new one-stop shop website that provides the industry with all things MDH. A feature of the website is the extensive collection of resources and case studies showing why some MDH developments work better than others. Knowledge and insights from these can be used for development, design, construction and post-occupancy considerations such as management and maintenance.

Identifying the skills gaps

To help understand some of the barriers impeding the delivery of high-quality medium-density housing in New Zealand, 105 building industry people were interviewed about MDH. The research explored who in the industry has the interest and ability to deliver MDH and what skills gaps may prevent its delivery.

Specific skills shortages were highlighted for technical aspects of MDH and more generally in design, prefabrication, project management, building, consenting, development and engineering. Interviewees recommended that investment be made in upskilling the existing workforce in MDH. Their recommendations included the need for improved skills in consenting and the technical aspects of building MDH. Better coverage of MDH building practice during apprenticeship training was also recommended in the report.

Understanding consenting challenges

The consenting process has been identified as a sticking point for delivering MDH in New Zealand. BRANZ's research in this area found that building consenting processes in 2018 were adding time and expense to the process. This was preventing some smaller industry members from being interested in or able to deliver MDH.

Builders and consenting authorities both agreed this was a key finding in identifying challenges in the MDH consent processes. If resolved, this problem would make a significant difference to those building and consenting MDH.

BRANZ has made a series of recommendations to the Ministry of Business, Innovation and Employment based on our research and understanding of the issues. Further work, now underway, is looking at potential solutions to the challenges.

MORE INFORMATION

Study reports www.branz.co.nz

- › ER33 Medium-density housing assessment tools: Summary report
- › SR408 Medium-density housing: Can we build it?
- › SR381 Perceived barriers to getting resource and building consents for medium-density housing

Medium-density housing website www.mdh.org.nz

Supporting government with expertise

Through its long-term research work, BRANZ is well placed to provide evidence-based advice and information to support local and central government housing initiatives.

The Government's KiwiBuild programme, for example, is using a wide range of research evidence and expertise from BRANZ to help ensure homes are constructed to the high standards that people expect. BRANZ's research on warm, dry and healthy buildings, innovation and quality is a key part of this.

Expert technical advice was provided to help the KiwiBuild procurement panel assess bids for supplying affordable homes and housing components. BRANZ's expertise and advice was also sought on potential design standards. This included helping confirm that manufacturers can meet New Zealand's unique 50-year durability requirement, essential because of New Zealand's climatic conditions and seismic risk.

Thinking differently about ownership

A study on alternative tenure models for home ownership published in 2018 considered whether overseas models have potential in a New Zealand context. It also looked at the different models currently operating here and their feasibility.

Alternative tenure models provide a way for people to access affordable high-quality homes with long-term security without the need to pay current market prices.

The BRANZ-funded research investigated how alternatives to traditional ownership could be upscaled to help more people buy their own home.

Models already used in New Zealand include shared equity schemes, licence to occupy agreements, and papakāinga housing initiatives (community housing on Māori ancestral land). Typically, the alternative tenure schemes that endure are run by community-based, not-for-profit organisations and state agencies.

The research found that while these schemes work well, limited access to capital has restricted their ability to grow. In order to improve uptake of these models, significant quantities of low-cost long-term capital would be required for providers to operate at scale.

This research is being actively shared and discussed with public policy makers, the finance sector, community housing groups and people in the social sector.

MORE INFORMATION

Study reports www.branz.co.nz

- › ER35 Alternative tenure models and their potential applicability in a New Zealand context
- › ER37 What's happened in the intermediate housing market since 2015?

RESEARCH NOW

www.branz.co.nz/researchnow

- › Alternative tenure models #1: What are alternative tenure models?
- › Alternative tenure models #2: Which alternative tenure models suit which households?



Celebrating next-generation thinking

Engaging the next generation of architects, engineers and construction managers will bring a fresh perspective on housing design, inspired by different experiences and new approaches to the way we live.

In multi-disciplinary teams of three, competitors in the BRANZ-supported ArchEngBuild event designed solutions to a critical industry issue in just three days.

The initiative nurtures collaboration and innovation at the very beginning of students' careers. Competitors come away with skills and a deeper understanding of each other's expertise that help build the capability needed to meet the significant challenges facing the industry.

Now in its seventh year, the 2018 challenge was to design a multi-generational, medium-density housing community complex for Wellington. The winning design, Tupu, used a modular concept that can be duplicated for consistency of materials and installation. It is also adaptable to cater to the changing needs of a household over time in terms of size and shape.

The ArchEngBuild Challenge 2018 not only encouraged fresh thinking around medium-density housing design, it proved to be a source of inspiration to existing practitioners in the industry.

The Hon Jenny Salesa, Minister of Building and Construction, presided over the prize-giving as guest of honour for the challenge finale.



BRANZ SCHOLARSHIP SPOTLIGHT

Sustainable urbanism

Olivia Whyte, University of Otago, Master's

Olivia's research investigates new styles of living (sustainable urbanism and co-housing) within the built environment for enhanced health and wellbeing as well as environmental outcomes.



Left to right: the winning team Monica Varrie (Unitec – Construction Manager), Liam Crawford (AUT – Architectural Engineer) and Georgia Peacocke (Victoria University of Wellington – Architect) and Hon. Jenny Salesa, Minister of Building and Construction.



Changing environment

Chelydra

*HOW DO WE ENSURE THAT THIS SYSTEM
KEEPS PERFORMING IN A WAY THAT
CREATES BETTER OUTCOMES FOR ALL
NEW ZEALANDERS? AND SUPPORT THE
SYSTEM TO TACKLE THE HARD ISSUES...*

Providing practical solutions to help grow our resilience to natural events and reduce our impact on the environment.



Measuring and lowering emissions

Climate change is recognised as one of the greatest challenges for humankind. Faced with increasing insurance costs from weather-related events, students marching for urgent action on climate change, and councils declaring climate emergencies, a pathway to a low-carbon economy is now urgent.

The New Zealand built environment produces 13-20% of the country's total greenhouse gas emissions. This means the construction sector has an important part to play in supporting a transition to a low-carbon built environment. BRANZ research is playing a vital role in the effort to reduce greenhouse gas emissions produced by the built environment. Tools developed by BRANZ and its research partners are helping the industry transition to a net-zero carbon economy.

Shifting to net-zero

Work is underway on a nationwide carbon budget for buildings which will enable the measurement of greenhouse gas emissions from the built environment. This will help New Zealand's building and construction industry play its part in mitigating the effects of climate change by supporting it to meet emission targets over a specified timeframe.

Emissions are embodied in the production of building materials and in building processes. They are generated through operations, maintenance and end-of-life disposal.

Finding ways to address emissions from both existing and future buildings is critical to supporting a shift to a net-zero carbon economy.

BRANZ, along with research partner Massey University, is developing a nationwide baseline of greenhouse gas emissions for the built environment. This baseline will also describe what a carbon budget would look like for both residential and office buildings.

The research project will provide the industry with clear guidance that is consistent with current climate change science and national goals on greenhouse gas emissions.

It is also exploring international initiatives that encourage the building industry to adopt carbon-reduction targets and reduce emission profiles. This work is expected to be completed by mid-2019.

MORE INFORMATION

Build Magazine
www.buildmagazine.org.nz

> Issue 167

Understanding the impact of construction materials

A new database provides greater transparency around the 'embodied' climate change implications of material and product selection.

BRANZ CO₂NSTRUCT provides values for embodied greenhouse gas and energy for construction materials and products to help inform building design. It includes data for a wide range of materials and products – from in-situ concrete and fibre-cement, to paints and elevators.

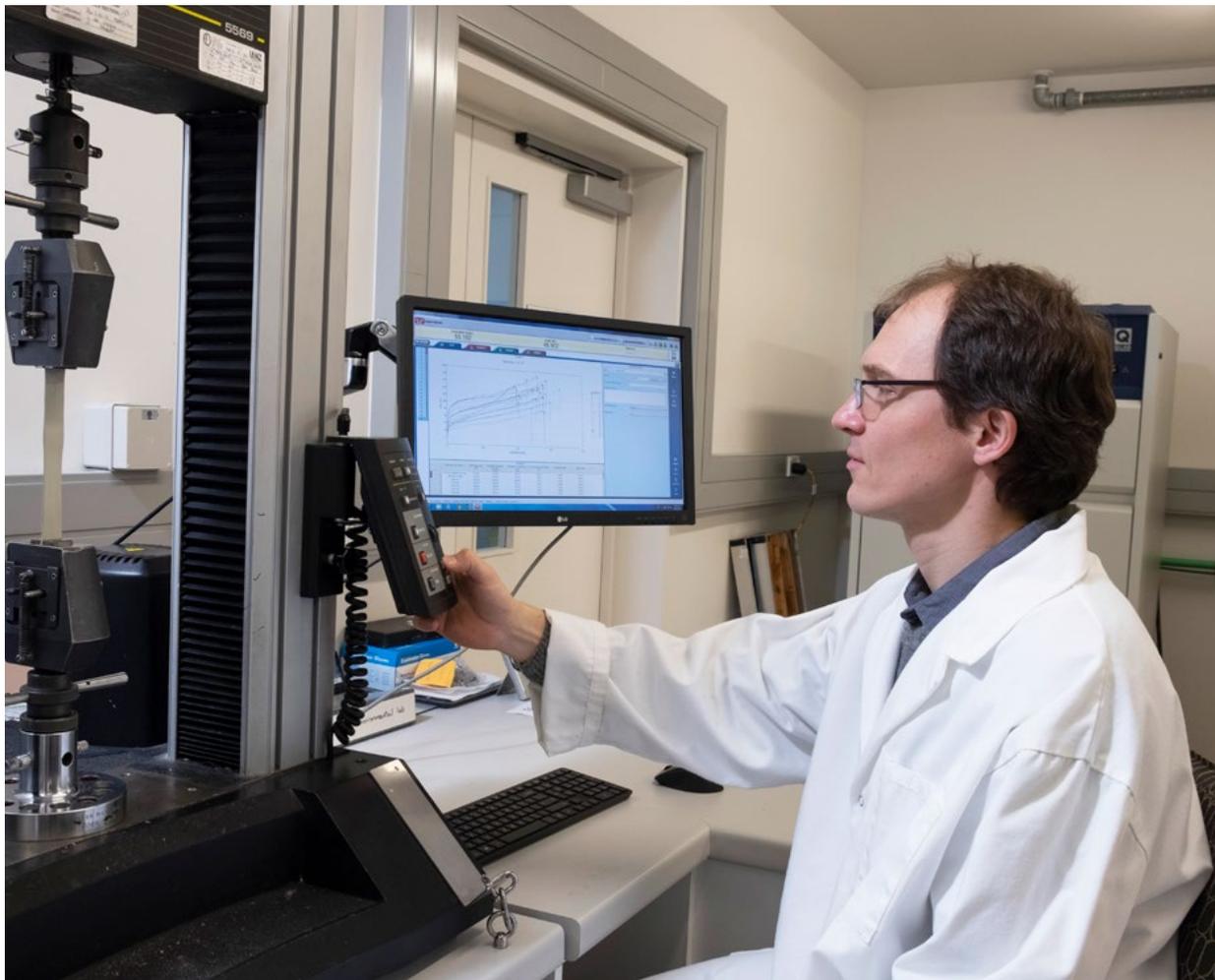
The embodied energy for each material is divided into renewable and non-renewable sources. The term 'embodied' encompasses the greenhouse gas emissions from the extraction, transport and manufacturing processes to produce a material or product. In general, this is taken up to the manufacturer's factory gate.

This is an important part of assessing the total life cycle environmental impact of building products. Materials and product

choices need to be considered in the context of the building in which they will be used as well as their ongoing maintenance requirements and performance. To complete the picture, BRANZ's tool LCAQuick can be used to calculate life cycle environmental impacts (including climate change) of buildings.

MORE INFORMATION

www.branz.co.nz/co2nstruct



Konrad Suschke, BRANZ Materials Scientist is shown testing tensile strength of wet area membranes.

Making better environmental decisions

The use of BRANZ's carbon assessment tool LCAQuick gained momentum in 2018. This innovative free tool helps organisations make better decisions about the environmental impact of a new building throughout its whole lifetime.

Architects, engineers and clients involved in the design of a building can use LCAQuick to measure a building's water use, construction waste, and transport and environmental data.

It is one of only a few built environment tools available worldwide that enable users to evaluate the environmental impact of a building's design and help them make more informed decisions.

The New Zealand Productivity Commission's 2018 report *Low-emissions economy* highlighted the potential of LCAQuick to support low-emissions building design. Recently, Christchurch City Council selected LCAQuick from around 15 tools to guide the procurement of all new Council-owned buildings from 2020.

The tool has also paved the way for BRANZ's participation in international efforts to improve knowledge of the life cycle of greenhouse gas emissions from buildings and emission reduction methods. For example, BRANZ represents New Zealand as a participant in the International Energy Agency's work on standardising LCA methodologies across countries.

MORE INFORMATION

Build Magazine
www.buildmagazine.org.nz

> Issue 167

Download LCAQuick
www.branz.co.nz/buildinglca

Chelydra

WE FOUND BETTER PATHWAYS TO MAKE OUR RESEARCH FINDINGS MORE ACCESSIBLE FOR END USERS THROUGH PRACTICAL INFORMATION AND TOOLS FOR THE WORKSITE.

Supporting better product choices

In 2014, with funding and support from BRANZ, an Australasian scheme was launched to enable New Zealand product manufacturers to provide environmental product declarations (EPDs) for building products.

An EPD is a voluntary declaration made by a product manufacturer that provides quantified environmental data and other information for people interested in using their products.

In 2018, the 50th EPD was published, a true milestone for the Australasian scheme.

EPDs provide independent, objective, science-based information about the environmental impact of products. They include data on raw material acquisition, energy use and efficiency, emissions, waste generation, and the content of materials and chemical substances.

The availability of EPDs encourages the use of building products that cause less stress on the environment. BRANZ's research shows that EPDs can also help provide robust evaluation of the environmental performance of New Zealand buildings across their lifetimes.

MORE INFORMATION

www.branz.co.nz

> LCA and EPD services

www.epd-australasia.com





Helen

WE PROVIDE THE EVIDENCE THAT CAN UNDERPIN IMPORTANT DECISIONS NEEDING TO BE MADE BY THE BUILDING SECTOR.

Taking stock of climate change knowledge

As the call for climate change action grows, a review of the knowledge developed to date provides a vital resource for those grappling with the difficult issues.

To help plan the transition to a net-zero carbon economy for the built environment, BRANZ undertook a stocktake in 2018 to identify work underway and any significant gaps in the knowledge landscape.

This stocktake examined current scientific evidence and initiatives relating to the built environment and climate change. It assessed New Zealand research on residential and non-residential buildings and climate change, especially examining energy and thermal performance, materials in construction and tools for evaluating carbon performance.

The work made three recommendations for climate action to enable the transition to a net-zero carbon built environment. These include developing measures for increased energy efficiency, reducing the carbon embodied in the materials used for building, and using a strategic leadership approach for climate action.

The stocktake's report creates an important record of where and how climate change impacts on the built environment and provides a significant building block towards New Zealand's transition to a low carbon economy. It has been well received by government agencies and helps set the scene for future work in this area by those committed to change.

MORE INFORMATION

Study report www.branz.co.nz

› SR403 The built environment and climate change: A review of research, challenges and the future



BRANZ SCHOLARSHIP SPOTLIGHT

LCA of thermal envelopes

Sanjeev Ganda, Victoria University of Wellington, Master's

Sanjeev's research assesses how residential thermal envelopes affect the environment. It will start with the New Zealand Building Code requirements then test industry best-practice methods. It will look into whether residential buildings with low-energy usage are environmentally friendly.



Responding to an unpredictable Earth

At two minutes past midnight on 14 November 2016, a magnitude 7.8 earthquake struck near Kaikōura.

The shaking triggered the partial collapse of two precast concrete floors in Statistics House on the Wellington waterfront, 150 km north. Fortunately, the midnight timing of the quake meant no lives were lost.

Other mid-rise buildings across Wellington also experienced damage to precast floor systems, ranging from minor to significant cracking.

Taking action on emerging issues

Damage to the 12-year-old Statistics House in Wellington caused by the Kaikōura earthquake raised an alarming prospect. Some new buildings were apparently not as safe as had been expected and there was clearly a gap in our understanding of the impact of seismic activity on these new buildings.

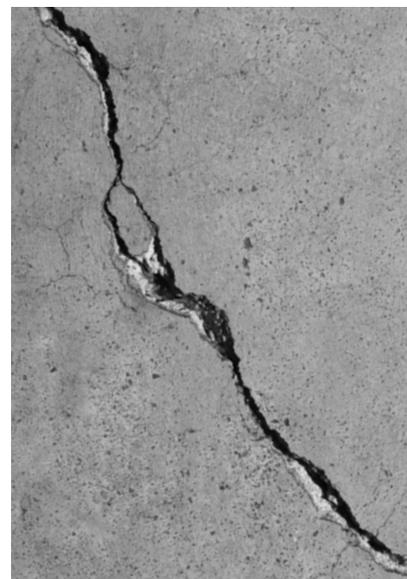
New Zealand's use of precast floors in regions of high seismic activity is unusually high compared to worldwide. It is estimated that more than 60% of commercial floor area in major centres falls into this category.

Building conversions mean there are also increasing numbers of residential buildings with older precast flooring.

Using the Building Research Levy, BRANZ was able to fund a scoping project that has led to a new nationwide research programme. This programme aims to improve the assessment, retrofitting and design of precast concrete flooring in New Zealand. There is little relevant local or international research on the earthquake resistance of precast floors.

The ReCast Floors programme was launched in 2018 with support from the Earthquake Commission and Concrete NZ. The three-year \$1.8 million programme is scheduled to run until October 2021, with BRANZ funding more than half of the work.

The programme draws on the knowledge and experience of researchers from Auckland and Canterbury universities and BRANZ, along with practitioners from engineering consultancies.





Statistics House,
Wellington.

It will produce new guidance on retrofit solutions to improve the safety of buildings using precast concrete floors. This guidance will supplement the 2017 seismic assessment guide (also known as the *Red Book*), which incorporated lessons from the Canterbury earthquakes.

BRANZ's previous research into the seismic performance of precast hollowcore concrete floors has given the ReCast Floors programme a significant head-start. This work was prompted by the poor performance of precast hollowcore concrete floors in the Kaikōura earthquakes of 2016.

It found that most New Zealand research investigated the performance of 300mm thick hollowcore flooring and not the more commonly used 200mm thick product. This helped refine the focus of the ReCast Floors programme.

Although in its early stages, the research so far has revealed that 200mm thick hollowcore floors have different seismic failure modes to 300mm thick hollowcore floors.

Helen

WE ARE VERY CLEAR THAT WE ARE NOT ADVOCATES FOR THE CONSTRUCTION INDUSTRY. WE PROVIDE THE EVIDENCE THAT CAN UNDERPIN IMPORTANT DECISIONS NEEDING TO BE MADE BY THE BUILDING SECTOR.



BRANZ SCHOLARSHIP SPOTLIGHT

Multi-volcanic hazard impacts

Nicole Allen, University of Canterbury, Master's

Nicole's research aims to illustrate the fragility of New Zealand's building systems to multi-volcanic hazards and test the effectiveness of mitigation strategies. She will test impacts of interacting hazards and the impact of rocks from volcanic eruptions on timber-framed roofing sections.



Nigel Kell, Senior Technician Materials of BRANZ, inspecting the seals of double glazing units prior to testing for durability.

Changing practice

Chelydra

*IN THE FUTURE OF BRANZ,
WE SEE REALLY IMPORTANT
OPPORTUNITIES AHEAD.
WORKING WITH THE INDUSTRY,
WITH GOVERNMENT AND
WITH INDUSTRY CLIENTS
AND COMMUNITIES.*

Influencing and responding to the way New Zealand's building and construction industry works.



Improving mental health and wellbeing

There is a growing appreciation of the importance of good mental health and wellbeing at work. In Westernised countries, poor mental health is the primary cause of lost working days. Significant work is going into improving society's understanding of and support for mental health and wellbeing. This is now extending into workplaces as a commitment to understand of how a range of different approaches can be used to support workers' mental health and wellbeing.

Mental health is a significant issue for New Zealand's construction industry which has the highest proportion of suicides across all industries in New Zealand. Of all male suicides in New Zealand, 6.9% are committed by members of the construction industry workforce. Construction workers aged 18-25 years are six times more likely to die by suicide than from a workplace accident.

Talking about mental health in construction

BRANZ is playing a key role in opening up conversations around mental health in the construction industry. These are difficult conversations for any industry, but the initiative has met with overwhelming support.

The mental health of New Zealand construction workers was put under the spotlight in a scoping study by BRANZ in 2018. This initial study attracted a lot of attention, generating discussion in the news media, at conferences, in boardrooms, in workplaces and on building sites.

Mental health is a complex issue with many contributing factors. The study found that industry representatives identified several factors that might explain suicides and underlying mental health issues within the construction industry. →

Chelydra

IT'S BEEN GREAT TO SEE HOW OPENLY OUR GUIDANCE IS RECEIVED AND OUR MATERIAL IS USED AND ALSO THE HONESTY OF SOME VERY TOUGH DISCUSSIONS TAKING PLACE RIGHT NOW FROM THE BOARDROOM TO THE WORKPLACE.

Poor industry culture was seen as a key contributing factor to mental health issues with work site culture often described as “macho” and “bullying”. Other factors identified by the 19 interviewees included:

- › The industry may attract high-risk individuals;
- › The industry is high stress and high pressure, with unpredictable workflows and lack of security;
- › The long hours lead to fatigue and stress on family relationships;
- › There are inter-generational differences between younger and older workers, especially in communication styles and career advancement expectations.

Previous studies found that the impacts from poor mental health on the construction industry were likely to include low productivity, absenteeism, presenteeism (being on site but not mentally engaged in work), and reduced quality of work.

Action to address issues

The interviewees, who included industry and health experts, were unanimous in their view that more research was needed to better understand poor mental health and its consequences. BRANZ was regarded as being in a good position to partner with industry on this.

More work is now underway, including several industry groups looking at introducing programmes such as mental health first aiders in businesses and *MATES in Construction*. These programmes encourage and facilitate help-seeking behaviour by workers.

Factors in suicide

As a follow-on, BRANZ funded a study by Site Safe New Zealand in 2018/19 looking at all coroners’ findings into suicide by construction workers between 2007 and 2017 – around 300 cases.

The results also support the view that there are a multitude of factors that contribute to the suicide risk for construction industry workers.

The findings provide new insights about these factors, especially work-related ones. Job insecurity or uncertainty, and work-related stress were identified in the coronial reports, particularly for self-employed contractors and business owners.

This research is an important starting point for future work that will help shape intervention and prevention actions to address mental health issues in the industry.

MORE INFORMATION

Study reports www.branz.co.nz

- › SR411 Mental health in the construction industry scoping study
- › ER40 Suicide in New Zealand’s construction industry workforce: Factors identified in coronial reports

Build Magazine
www.buildmagazine.org.nz

- › Issues 168 and 170

NEED TO TALK?

There are several national helplines available:

- › Free call or text **1737** any time for support from a trained counsellor
- › **Registered Master Builders Association members and staff** – 0800 800 397
- › **Lifeline** – 0800 543 354 (0800 LIFELINE) or free text 4357 (HELP)
- › **Suicide Crisis Helpline** – 0508 828 865 (0508 TAUTOKO)
- › **Healthline** – 0800 611 116
- › **Samaritans** – 0800 726 666.



BRANZ SCHOLARSHIP SPOTLIGHT

Men’s health and suicide prevention

Andy Walmsley, Massey University, PhD

Andrew’s research investigates what barriers could prevent men who are working in the construction industry from seeking help for psychological distress. Greater awareness of mental health needs can help create a productive, safe and resilient workforce.



Understanding performance

New building materials, products, designs and techniques are being created and introduced into the New Zealand building system all the time. Understanding how these individual new elements perform, particularly over the long term, is critical to ensuring they are fit-for-purpose and help maintain a safe and high performing building environment.

Predicting the spread of external fires

International fire incidents and the growing use of combustible materials on building facades are raising questions about controls in New Zealand for external facade fire spread.

Ongoing BRANZ research is investigating how fire spreads on the outside of buildings. A recently completed project investigated the heat produced from flames projecting out of windows. The results have provided design recommendations to help engineers more accurately evaluate the potential for vertical spread of fire due to fuel load and window size.

Previous guidance predicted flame heights but didn't provide results that fire practitioners could use to reliably estimate the heat above openings. This information is now available in a BRANZ study report.

A subsequent project has also investigated the heat produced from flames projecting from a roof adjacent to a taller building. The results will be available soon.

Further research will look at how combustible facade systems react to fire. A series of large-scale combustible facade experiments will assess the range of combustible materials found in typical New Zealand building facades.

MORE INFORMATION

- Study report www.branz.co.nz
- › SR360 Vertical external fire spread from flames extending out of an opening



Proving facades are fire-safe

It is vital that the building and construction industry has access to the evidence it needs to produce fire-safe buildings.

BRANZ is now building New Zealand's only facility capable of fire testing full-scale facade systems. The new specialist test rig will offer clients the capability to test a whole exterior system – the cladding, cavity and substrate.

This will be a critical service for product manufacturers in New Zealand and for suppliers importing building materials who want to ensure fire-safe buildings. The facility will also be used for BRANZ researchers to gain practical understanding of facade fire spread through their ongoing research work.

Previously, whole systems had to be tested in the United States.

The new facility at BRANZ will be operational by the end of 2019.

Helen

**INDEPENDENCE
AND IMPARTIALITY ARE
FUNDAMENTAL FOR US.**



Increasing industry knowledge about fire

Many people in the industry are involved with designing, building, inspecting or maintaining building fire separations.

To demonstrate fire safety compliance, the building assemblies that make up the fire separations nearly always need to be based on robust fire-tested details or assessment.

There is a large body of anecdotal evidence that many New Zealand buildings include building assemblies with questionable fire performance because these assemblies are not grounded in fire test results or a proper assessment.

One reason could be that most industry people have never had the opportunity to observe first-hand how fire conditions may affect building assemblies.

BRANZ has been tackling the issue this year by kicking off the production of a professional development course on fire testing and assessment. The course aims to improve knowledge about building assembly fire performance for industry people from a variety of backgrounds such as fire engineers, architects, building inspectors and builders.

Course participants will hear from BRANZ staff about fire testing and assessment methodologies and visit the BRANZ fire laboratory to see how building products perform under fire conditions. Demonstrations during the course will cover fire resistance and reaction to fire. Once fully developed, the course will be available in 2021.



BRANZ SCHOLARSHIP SPOTLIGHT

Predicting Structural Fire Severity

Jono MacIntyre, University of Canterbury, Master's

Jono's research will formulate an energy balance of the thermal and imposed energy versus capacity of a simple structural-steel element. It will aim to modify and expand this to apply to other materials.

Understanding timber durability

New Zealand is experiencing a resurgence in the use of timber construction particularly as the industry grows more confident with using engineered timber products. But moisture can impact the durability and performance of timber structures, affecting not only the timber but everything associated with it such as fixings and preservatives.

The long-term moisture dynamics within timber across different New Zealand outdoor environments are poorly understood. To understand what may happen within more complex engineered timber products and structures requires a clear understanding of the moisture dynamics within the purest form of timber-sawn timber.

BRANZ's long-term project *Towards durable timber structures*, commenced in 2018. It will build a baseline knowledge of timber durability throughout the country looking at both sapwood and heartwood.

To monitor and compare physical degradation, BRANZ has mounted sawn timber samples on racks at eight different sites exposed to the elements around New Zealand. The racks collect moisture content data as well as ambient and sample temperatures.

The knowledge gathered from this research will be used to help predict the long-term durability of timber materials. Further work will be designed to investigate how combinations of sapwood and heartwood impact the moisture dynamics of engineered timber products. These include reconstituted products such as particleboard, strand board and plywood.

The first stage of the project is scheduled to run until March 2020.

MORE INFORMATION

Build Magazine
www.buildmagazine.org.nz
> Issue 162



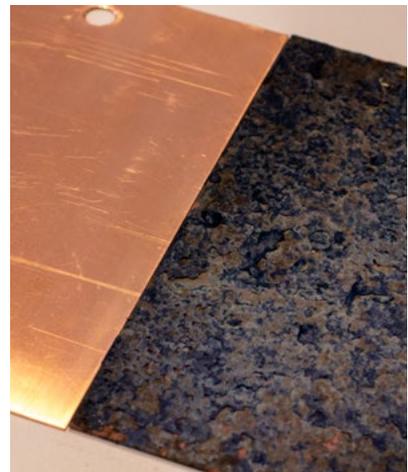
BRANZ SCHOLARSHIP SPOTLIGHT

Inspiring better energy use

Emily Newmarch, Victoria University of Wellington, Master's

Emily's project, *Climatic conscience for dwelling design*, investigated the energy and thermal performance of houses in the Central Otago region, one of New Zealand's coldest. It explored how energy use can be reduced while retaining design features that contribute to the aesthetic experience of the building. The designs were intended to support and inspire both architects and consumers to build beyond the minimum requirements of the Building Code.

Emily's project won the top prize in the annual 2018 Student Design Awards for final-year architecture students from the University of Auckland, Unitec and Victoria University of Wellington. The competition is held by the New Zealand Institute of Architects.



Timber and copper samples being tested for durability under different environmental conditions.



Getting the message out

We live in a digital age where we can access huge amounts of content with the single click of a button. It is easy to be overwhelmed by the volume of information and uncertainty about its accuracy. For researchers who aim to catalyse change, turning their research into action is one of their biggest challenges when methods of communication and engagement are becoming more diverse and complex.

One of BRANZ's goals is to transform insightful research into trusted, accessible, actionable knowledge. We are constantly challenging ourselves to find new, and better ways to turn our research findings into practical and useful applied knowledge.

Connecting with Asian construction workers

The inaugural Asian Construction Forum held in 2018 was a welcome industry initiative. The Auckland region alone employs 5,000 Asian construction workers, and \$7 billion is being invested in New Zealand construction every year by Chinese developers.

Around 800 people from across the sector attended this new event in Auckland. BRANZ, as one of the presenters, seized the opportunity to champion the need for building quality, given the continuing pressure for fast solutions to housing shortages.

At the forum, BRANZ researchers provided an overview of the New Zealand Building Code and compliance options in Mandarin and English, with a focus on durability requirements. Issues of non-compliance were also covered, and clarification provided on where responsibilities lie within the industry. There was a high level of interest in BRANZ's work, and BRANZ is committed to attend the next forum.

Detailing junctions with the industry

Most modern buildings have a degree of complexity that results in a wide range of junctions between materials and building elements. These junctions must be detailed and constructed to ensure the building complies with the New Zealand Building Code, particularly for durability and external moisture issues.

Given the problems that can arise in modern buildings around junctions, BRANZ designed a seminar about the correct construction of junctions and took this out to 21 locations around the country.

Each seminar session covered the key influences on junction quality and took attendees through a range of case studies on diverse junction detailing.

The seminars attracted architects, designers, builders, building consent authorities, cladding installers, building surveyors and others in the industry who work with junctions.

Engaging through live webinars

A series of live-streamed webinars is being used to deliver technical information to busy building professionals and inspire them to provide better buildings for New Zealand.

An interactive webinar format was chosen to enable greater audience and presenter interaction. Participants can view the webinars on any device and get answers to their questions in real time.

In early February 2019 BRANZ launched a lunchtime series with a one-hour stream on multi-storey light timber-framed buildings. Other webinars are addressing building quality; managing moisture; seismic resilience; compliance; managing a building business and other key topics of interest to building professionals.

The webinars target specific sectors of the industry and are designed to ensure the information is relevant to sector participants. Anyone can register and dial in to the webinars to learn more about BRANZ research and what matters to industry.

MORE INFORMATION

www.branz.arlo.co

Helen

WE WILL CONTINUE TO ENSURE OUR RESEARCH RESULTS GET OUT TO ALL SORTS OF PEOPLE IN ALL SORTS OF WAYS.

FOR EXAMPLE, OUR BUILD MAGAZINE GOES OUT TO 40,000 PLUS PEOPLE IN THE INDUSTRY EVERY 2 MONTHS.

Showcasing BRANZ and its facilities

During the year we welcomed a wide range of visitors at our Judgeford campus outside Wellington. Visitors are shown our testing facilities and laboratories to gain a better understanding of our capabilities, how we work and see industry-based research in action.

This year, BRANZ Chief Executive, Chelydra Percy was delighted to host the Prime Minister's Chief Science Advisor Professor Juliet Gerrard at BRANZ. This was a welcome opportunity to talk with Professor Gerrard about BRANZ's science, strategy, Building Research Levy stewardship and investment plans, and about the way we work. Professor Gerrard also toured the campus, visiting some of BRANZ's key test labs.

BRANZ staff also host large groups of students from building-related disciplines on site visits. These visits help build their understanding of good practice and inform them about the tools

BRANZ has available that they can access in their future work in the industry. This year students visited from institutions such as Toi Ohomai Institute of Technology (Tauranga campus), Victoria University of Wellington (VUW), Universal College of Learning (UCOL) and Wellington Institute of Technology (WelTec).

The second-year architectural students from Toi Ohomai visited BRANZ to hear about BRANZ's role in the industry and our appraisals work. Their visit included a tour of our labs.

The large groups from Engineering New Zealand, WelTec and VUW were taken through the structures, fire and materials testing labs, shown a real insulation fire test, the structures pressure box test, the shake table in action and our bracing rig. In the materials lab, BRANZ staff demonstrated the durability of membranes when exposed to below-zero temperatures.



Peter Whiting, Senior Fire Engineer/Fire Testing Team Leader at BRANZ, explaining the workings of the cone calorimeter fire test to visiting students.



Transforming our industry

BRANZ is committed to lifting the performance of the building system in New Zealand so it can deliver better outcomes for all. This commitment underpins everything that BRANZ does. It guides our investment of the Building Research Levy and drives our strategic leadership initiatives such as the development of Artisan and the Industry Transformation Agenda (ITA).

Catalysing system change

BRANZ facilitated the launch of the ITA in August 2017 as a call to action to the industry to join forces and deliver urgently needed transformative change across the sector

Our ITA work this year has focused on catalysing and supporting new ways of thinking within the sector. This has included building a repository of new knowledge and insights to share through the Industry Transformation website and regular newsletters.

We also hosted a suite of leadership conversations, and facilitated workshops on risk management, data management and system-wide thinking.

Highlights of the year included:

- › Discussions with industry leaders and Professor Tim Flannery on the personal challenges of change leadership;
- › A workshop with Alasdair MacLeod, Chair of the Port of Napier Limited, on how to overcome blockers to change and lessons he has learnt in driving change in other industry sectors;
- › A meeting of industry leaders with Professor Ludo Van der Heyden from Insead Singapore on governance challenges in the construction sector;

- › A workshop with Sean Tompkins, CEO of RICS, on lifting professionalism and ethics to drive much needed culture change in the construction sector;
- › A discussion with Sean Ellison, also from RICS, on the latest survey results from the Asia Pacific Construction and Infrastructure Market Survey.

During the year, the ITA also tested hypotheses around risk management, in partnership with industry players. An initial project with the University of Auckland's Te Pūnaha Matatini Centre of Research Excellence focused on how to optimise the spread of risk in contracts across the different parties. A complementary project

has looked at characterising failure on building industry contracting networks, the cascading effect of failure and industry resilience.

BRANZ looks forward to working closely with the highly anticipated Construction Sector Accord in the coming year. Industry transformation of the building and construction sector in New Zealand is a challenging and long-term game. BRANZ is keen to see all the key players in the system committed to delivering transformative outcomes across the sector and welcomes the establishment of the Accord.

MORE INFORMATION

www.industrytransformation.nz



Prime Minister Jacinda Ardern and Government Ministers talk with construction industry representatives at the launch of the Construction Sector Accord.

Innovating to drive productivity improvements

BRANZ has been leading the way in the transformation space by developing the game-changing Artisan product. This project has been a key initiative within the Industry Transformation Agenda.

BRANZ has worked in close consultation with the building and construction industry to create Artisan – a new technology designed to improve build quality assurance and Building Code compliance in the residential building inspection process.

This state-of-the-art mobile phone app and web console solution enables each step in the residential build inspection process to be prescribed, seen, assessed, verified and recorded. It provides a workflow to capture real-time photographic evidence of the quality of work for critical elements of a build, corresponding to the stage checks undertaken by building consent authorities (BCAs). This produces a permanent record of evidence associated with each build.

Auckland Council and Tauranga City Council have been using Artisan since the end of 2018. They worked with selected building companies to implement the technology.

Phasing the roll-out of the technology with these organisations has enabled BRANZ to support Artisan in a manageable way. Feedback has been collated and analysed, learning resources tweaked, and on-site training provided where needed.

The initial councils and builders using Artisan have been overwhelmingly positive about the experience, not only endorsing the benefits BRANZ set out to achieve but also noticing additional advantages. These have included reducing health and safety risks, lowering vehicle costs, and enabling desk-bound inspectors to continue with inspections.

Artisan is already demonstrating that it will provide a lift in quality assurance for buildings and higher levels of workmanship. It also reduces the time to build by improving a build team's understanding of what BCAs are looking for, speeding up inspections and reducing rework. This all results in real productivity gains for the industry.

The staged roll-out approach is being extended to additional councils during 2019.

Chelydra

WE ARE NOW POISED TO ACHIEVE BIG PRODUCTIVITY SAVINGS WITH ARTISAN - A QUALITY ASSURANCE TOOL WE HAVE DEVELOPED FOR USE ON CONSTRUCTION SITES AS PART OF THE BUILDING INSPECTION PROCESS.

MORE INFORMATION

Artisan

www.branzartisan.co.nz

www.industrytransformation.nz

> action areas

Video -

www.industrytransformation.nz/ita-news/game-changing-artisan-app-update/

Email - artisan@branz.co.nz



BRANZ SCHOLARSHIP SPOTLIGHT

Robotic arm prefab panel

Glen Stricot-Tarboton, Victoria University of Wellington, Master's

Glen's research aims to manufacture customisable prefab panels using a robotic arm as an alternative to current prefabrication methods. This is an essential step in moving towards a new building system with multiple robots producing Building Code-compliant building panels.



BRANZ SCHOLARSHIP SPOTLIGHT

Integrating augmented reality with building information modelling (BIM)

Taylor Hubber-Davis, Victoria University of Wellington, Master's

Taylor's research seeks to determine the feasibility of augmented reality in construction. How might it help industry-wide understanding of BIM? An augmented reality mobile application will be developed and tested on a current construction project.

Leading BRANZ

Purpose is at the heart of BRANZ. As an organisation, BRANZ has and continues to put purpose at the centre of everything it does.

We know that having a declared purpose, and with leaders and employees aligned to that sense of purpose, we can effect real change.

Ensuring that our sense of purpose is shared, valued, and amplified through our decision-making and by our operational performance is the ultimate art of wise governance.

It is only by exercising the responsibilities of fiscal and operational stewardship that our purpose can be realised. Good governance keeps our research going. Our research changes lives.



**WITHOUT A SENSE OF
PURPOSE. NO COMPANY.
EITHER PUBLIC OR
PRIVATE. CAN ACHIEVE
ITS FULL POTENTIAL.**

Larry Fink
Chairman and
Chief Executive Officer
BlackRock Inc
Letter to CEOs – 2019



Looking forward



Five years down the track the Board and BRANZ leadership team are looking to the future, and a new strategic direction for the organisation. Dr Helen Anderson and Chelydra Percy continue the conversation with Vincent Heeringa and explore their ambitions for BRANZ and the industry.

Vincent **Time marches on and so do expectations. What are the challenges for the next five years?**

Chelydra Well, we are about to implement a strategy refresh and what excites me about this and what it means for BRANZ is that we're being far more ambitious.

Previously we've said BRANZ is about *inspiring the industry to provide better buildings for New Zealanders*. That's a great vision, but now we're saying we need to understand and engage with the whole system, not just specific elements within the industry.

So, our new strategy is about *challenging New Zealand to create a better building system that delivers better outcomes for all*.

This means government, clients, local authorities and all the other players are involved. Otherwise, how do we ensure that this system keeps performing in a way that creates better outcomes for all New Zealanders? And support the system to tackle those hard issues, whether it's homelessness or the failed business model or housing shortages, climate change or medium-density housing?

For example, how does the system create medium-density housing that is practical and beautiful to live in and has enough green spaces as part of its footprint so that the kids can still experience running around with the grass between their toes? Such challenges mean thinking more holistically about how people want to live in cities and communities and in their homes. For BRANZ, this means thinking about how we can help the industry be part of a building system that will deliver this.

Helen Absolutely. The sector has to think differently about how we will live in communities in the future and how it will contribute to the changes needed.

The papakāinga and some Māori housing developments are taking a totally different approach to how people live together in shared spaces. I have a disabled son who lives in an accessible housing arrangement. It's warm, sunny and dry. But it is also integrated into a community, and that sort of thing wasn't available a few years ago.

And as New Zealanders get older and more diverse, their needs change. Do they only want the option of moving to retirement villages and living in compounds of the elderly?

So, in the future of BRANZ, we see really important opportunities ahead, working with the industry, with government and with industry clients and communities. We will continue to do practical and immediately useful work.



We are investing in our facilities and our kit so we can do state-of-the-art product testing. We will continue to manage the Building Research Levy well and be open and accountable about its use. We will continue to ensure our research results get out to all sorts of people in all sorts of ways. For example, our *Build* magazine goes out to 40,000 plus people in the industry every two months, and useful information from BRANZ pops up everywhere – Statistics New Zealand, *Consumer* magazine, TVNZ and so forth.

But we are determined to help the industry lift its overall game. We will support transformative initiatives wherever we see them take hold across the sector. We will work for and with initiatives such as the Construction Sector Accord. And we will continue to bring people to the table for those courageous conversations our industry leaders need to have to build the high-performing sector New Zealanders need. That is part of the leadership mandate we will continue to deliver.

Vincent **How will we know when you've been successful? I mean, the science you do is often so under the radar, and this wider challenge is truly ambitious. What can people expect to see as a result of the work of BRANZ?**

Chelydra Well, people used to come into this industry because they were passionate about building a great building or bridge or tunnel or whatever.

But now, the way the building industry works, too many find it too stressful. Many people in the sector tell us they have lost that sense of drive and joy. It's got to the stage, as some recent BRANZ work indicates, that the stress is literally killing people.

So, I think if we were to say what would success look like, it would be about bringing that vision and drive and joy back into this sector. That we'd see an industry empowered to work with clients and communities in a way that created wonderful buildings that performed well – on their own and together – supported by infrastructure that reflected community and national needs.

Success would see people delighted to live, learn, meet and work in their built environment and a building and construction industry that was not only financially profitable but deeply satisfying and rewarding to work in.

Helen And I think one of the ways of measuring this would be we'd start to see people saying, "I want my kids to be in this amazing construction industry."

I don't think there's a lot of that going on right now, but I reckon it's possible.

Chelydra And it might even attract a more diverse workforce for us as well.

Helen Yeah. There's a thing! That would be amazing. That's the kind of future we're working towards. No silver bullet whizzing into view, but a whole heap of talent whose vision, innovation, skills and creative energy guide and drive the sector.

Not unlike the talented team of researchers, scientists, managers and board members we have at BRANZ.



Governance

BRANZ Directors

BRANZ Incorporated and BRANZ Limited are governed by directors with extensive building and construction, science, business and senior public-sector expertise.

Five directors of both BRANZ Incorporated and BRANZ Limited are elected by the Building Research Advisory Council (BRAC). In turn, the elected board can appoint up to three independent directors.

At 31 March 2019, the BRANZ Board has seven directors and one associate director.



Dr Helen Anderson, qso

Dr Helen Anderson (Chair) is an independent director of several organisations and former Chief Executive of the Ministry of Research, Science and Technology. She is a chartered fellow of the Institute of Directors in New Zealand (IoD NZ). She joined BRANZ in 2011.

Helen

AND WHAT EXCITES ME ABOUT OUR BRANZ LEADERSHIP WORK IS THAT IS TAKING A SYSTEM-WIDE VIEW OF THE WHOLE SECTOR.



Kevin Stanley

Kevin Stanley (Deputy Chair) has more than 25 years' experience in the construction industry and is currently Managing Director of the Stanley Group. He is a chartered member of IoD NZ and joined BRANZ in 2012.



Richard Carver

Richard Carver has a background in business leadership, management and governance. Richard is a co-owner of Jennian Homes, Milestone Homes and Construction Marketing Services Ltd. He is also a chartered member of IoD NZ. He joined BRANZ in 2013.



Lesley Haines

Lesley Haines has an extensive public sector background, including senior roles in the Treasury, the Ministry for Business, Innovation and Employment and the Department of Prime Minister and Cabinet. She is a trustee of Motu, New Zealand's premier economic research organisation. Lesley joined BRANZ in 2014.



Stephen Titter

Stephen Titter combines many years of practical financial and investment experience. Formerly a senior partner and board member for Ernst & Young, he is now a director on several boards, including the Real Estate Institute of New Zealand and the Selwyn Foundation. He joined BRANZ in 2014.



Alan Bickers, MNZM, JP

Alan Bickers has had a lengthy career in civil engineering, management, consulting and governance. He is experienced with regulatory functions, including building consents and compliance. He is a chartered fellow of IoD NZ and a past president and distinguished fellow of Engineering New Zealand. As inaugural Chairman of the Building Practitioners Board for eight years, he was responsible for developing and implementing the Licensed Building Practitioners Scheme. He joined BRANZ in 2015.



Pamela Bell

Pamela Bell is the Chief Executive of Prefab NZ Incorporated. She is a member of the Ministry for Business, Innovation and Employment Building Advisory Panel and the Construction Industry Council. She joined BRANZ in 2017.

Executive team



Chelydra Percy, Chief Executive Officer

Chelydra joined BRANZ in 2013. Prior to starting with BRANZ, Chelydra held a range of leadership roles with science and innovation organisations such as Callaghan Innovation, KiwiStar Optics and Scion. Chelydra has also worked in the electricity supply and telecommunication industries. She is a graduate of Victoria University of Wellington and a Companion of Engineering New Zealand.

Name	Position
Laurel Lee Berkett	PA to CEO/Company Secretary
Richard Capie	General Manager, Research Investment
Janet Geritzlehner	Human Resources Manager
David Johnson	General Manager, Consultancy Services
Chris Litten	General Manager, Industry Research
Kaetrin Stephenson	General Manager, Corporate Services

Board remuneration

Directors' fees for the BRANZ Group are reviewed biennially. The Board seeks independent advice to help with this process. The Board confirmed at the July 2017 annual meeting that fees would be increased. The Board also agreed to an increase in the Building Research Advisory Council (BRAC) honoraria.

BRANZ directors' fees

Board roles	Annual fees
Chair	\$54,000
Deputy Chair	\$33,500
Director	\$27,000
Committee chair	\$6,250
Representative on external board	\$6,250

BRAC honoraria	Annual fees
Chair	\$2,900 (per meeting)
Members	\$1,200 (per meeting)

Building Research Advisory Council

The Building Research Advisory Council (BRAC) plays a vital role in ensuring BRANZ's accountability and responsiveness to the New Zealand building and construction industry.

It meets twice a year to elect the BRANZ Board and advise on industry issues for BRANZ's consideration.

BRAC has 17 members representing 13 nominating bodies from the industry and trades, the business sector, consumers and the Government.

In 2018/19, BRAC welcomed one new member:

- › Kieren Mallon, representing the Registered Master Builders Association.

One member resigned:

- › Renelle Gronert, representing Housing New Zealand Corporation.

Name	Nominee of
John Melhuish (Chair)	New Zealand Institute of Architects
John Macdonald (Deputy Chair)	Registered Master Builders Association
John Beveridge	Building Industry Federation
Anna Butler	Ministry of Business, Innovation and Employment
Jacqui Bensemann	New Zealand Specialist Trades Contractors Federation
Mike Craig	New Zealand Certified Builders Association
Michael Davis	New Zealand Institute of Architects
Marshall Hudson	Business New Zealand
Ian McCormick	Local Government New Zealand
Alastair Miles	Business New Zealand
Grant Price	New Zealand Specialist Trades Contractors Federation
Richard Sharpe	Engineering New Zealand
Don Tilbrook	Civil Contractors New Zealand
Bill Whitley	Consumer New Zealand
Jon Williams	Property Council New Zealand

Developing the next generation

As part of BRANZ's leadership commitment to demonstrating good governance practices to the industry, the Board has appointed an Associate Director for the second time. The BRANZ Board created the role of Associate Director to help develop the next generation of directors within the building and construction industry. It also enables BRANZ to tap into diverse skills and insights.



Associate Director, Andy van Houtte

Andy van Houtte is a consulting engineer with extensive experience in the New Zealand and Australian timber manufacturing industries. He is a chartered member of the Institute of Professional Engineers New Zealand and a member of the Structural Engineering Society and Timber Design Society. Andy joined BRANZ in 2018 for a one-year term.

BRANZ directors – register of interests

As at 31 March 2019

Helen Anderson	<p>Directorships with</p> <ul style="list-style-type: none"> › Dairy NZ Ltd › NIWA › Massey University Council › Antarctica NZ › Institute of Directors, Wellington Branch › National Council of Institute of Directors › ClearPoint Ltd › Anderson Associates NZ Ltd › Scion <p>Other relevant interests</p> <ul style="list-style-type: none"> › Member, NZ Police Assurance and Risk Committee › Chair, MBIE Building Advisory Panel 	Lesley Haines	<p>Directorships with</p> <ul style="list-style-type: none"> › MOTU Economic and Public Policy Research 	
	Kevin Stanley	<p>Directorships with</p> <ul style="list-style-type: none"> › Stanley Group Ltd & subsidiary companies › Renovation Masters Ltd › Tallwood Holdings Ltd & subsidiary companies › Nivek Holdings Ltd <p>Other relevant interests</p> <ul style="list-style-type: none"> › Life member, Master Builders Association 	Stephen Titter	<p>Directorships with</p> <ul style="list-style-type: none"> › American Chamber of Commerce in NZ, Inc. › Guildford Investments Ltd › Hahei Consulting Ltd › Selwyn Foundation › Heritage Trust Company Ltd <p>Other relevant interests</p> <ul style="list-style-type: none"> › Business strategy advisor, Jennian Group
	Richard Carver	<p>Directorships with</p> <ul style="list-style-type: none"> › Construction Marketing Services Ltd › Jennian Holdings Ltd & other associated Jennian companies › Mstone Holdings Ltd & other associated Milestone companies › Productspec Ltd › Renovation Masters Ltd › Master Build Services Ltd › Just Life Group Ltd › Hometech Ltd › Carver Management Ltd › Goldcar Dairy Holdings Ltd › NSR Investments Ltd › Residential Building Services Ltd <p>Other relevant interests</p> <ul style="list-style-type: none"> › Chair, Master Builders Residential Working Group 	Alan Bickers	<p>Directorships with</p> <ul style="list-style-type: none"> › Jayal Enterprises Ltd › Trustpower Ltd › Trustpower Insurance Ltd <p>Other relevant interests</p> <ul style="list-style-type: none"> › Chair, Tauranga City Council's Greenfields Urbanisation Advisory Board › Committee member, Southland District Council's Te Anau Wastewater Project › Chair, Ministry for Primary Industries – Partnership Programme, Engineered Timber Buildings
		Pamela Bell	<p>Other relevant interests</p> <ul style="list-style-type: none"> › CEO, PrefabNZ › Member, MBIE Building Advisory Panel › Member, Construction Industry Council 	

Standard disclosure statement to be affirmed at the beginning of every Board meeting:

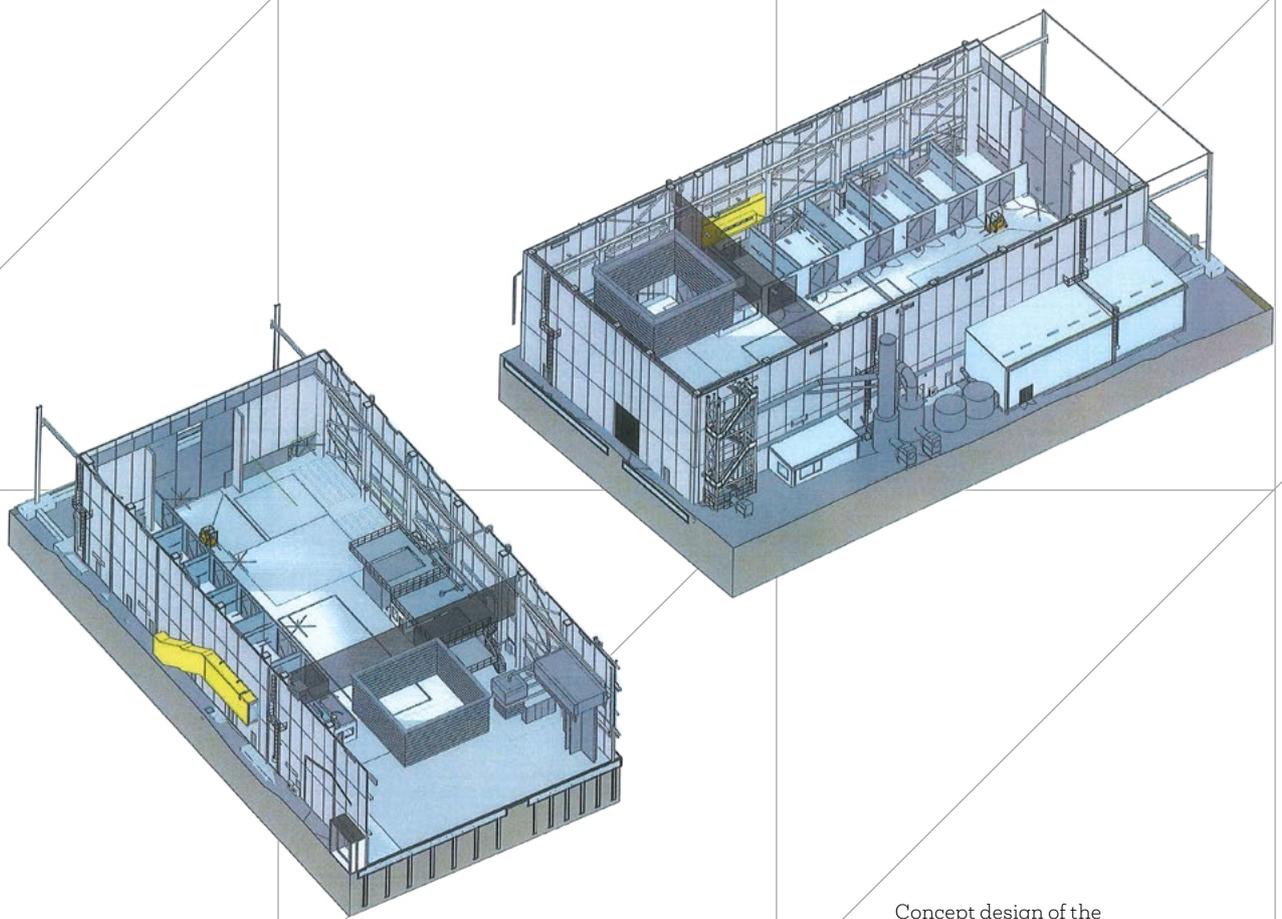
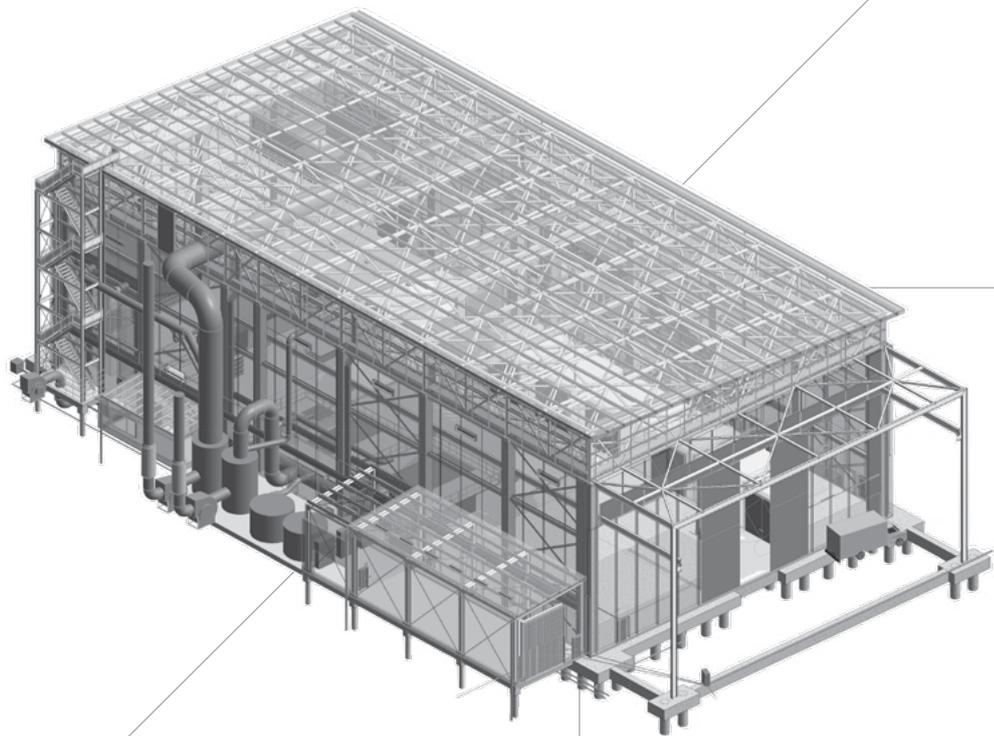
It is recognised that some members of the BRANZ Board represent companies or organisations or interests that are, or may be, in competition with those of other Board members. Meetings of the BRANZ Board and communications between members of the Board will not be used as a forum for unlawful collusion or anti-competitive conduct.

* Disclosure of significant shareholdings only, e.g. not shares held by family trusts.

Financial performance

Helen

*WE ARE INVESTING IN OUR FACILITIES
AND OUR KIT SO WE CAN DO STATE-OF-THE ART
PRODUCT TESTING. WE WILL CONTINUE TO MANAGE
THE BUILDING RESEARCH LEVY WELL AND BE OPEN
AND ACCOUNTABLE ABOUT ITS USE.*



Concept design of the proposed fire lab at BRANZ.



Our financial performance

The BRANZ Group derives its total income from a combination of the Building Research Levy, government science funding and commercial services.

Total income for 2018/19 was \$40.01 million. This consisted of:

- > \$21.53 million from the Building Research Levy to fund industry research and knowledge transfer
- > \$8.22 million from commercial services
- > \$9.21 million to fund 11th National Science Challenge (NSC 11)
- > \$1.05 million of other income.

This compares with \$35.74 million for the previous year.

Expenses were directly managed, which resulted in expenditure of \$37.89 million for the 2018/19 financial year. This was used to operate the business, directly deliver research outcomes, deliver the research under NSC 11, inform the industry and invest with other research providers. Also included within this expenditure was \$1.45 million of Phase 1 development costs for Artisan. These costs relate to a change to a new technology platform providing more flexible rollout opportunities and lower ongoing support costs, and which otherwise would have been amortised in a future year. Expenditure in the previous year amounted to \$32.32 million.

This was the third year of BRANZ hosting the NSC 11: Building Better Homes, Towns and Cities, which is valued at \$23.58 million over three years. By 31 March 2019, contracts were underway for all six strategic research areas and \$19.62 million had been invested.

A breakdown of the BRANZ Group financial results can be viewed on subsequent pages.

Long-term Levy utilisation policy

BRANZ gets its research income from Building Research Levy receipts, which are directly linked to the levels and values of building consents. This means Levy income is subject to the same boom-bust cycles as the industry.

BRANZ has a long-term Levy utilisation policy in place that helps manage these ups and downs in Levy income. It uses a 10-year model to create a stable, sustainable platform for BRANZ to invest the Building Research Levy effectively. In practice, this means when Levy income increases, BRANZ is prudent around expanding its investment. Then when Levy income decreases, BRANZ doesn't have to make unnecessary or drastic cuts.

The policy sets out how BRANZ will effectively manage the Levy by:

- › determining a Baseline Levy Investment Sum using the 10-year model. This is incorporated into the annual BRANZ Group budget for investment in Levy-funded activities
- › investing the Baseline Levy Investment Sum in internal and external research and knowledge dissemination
- › investing the Levy in an open, transparent and contestable way
- › ensuring that any investment in core internal capability is linked to BRANZ's long-term strategic priorities
- › investing so as to avoid unnecessary duplication of capability and facilities across New Zealand
- › ensuring availability of funding for maintenance and investment in property, plant and equipment
- › maintaining appropriate cash reserves.

The long-term Levy utilisation policy is reviewed bi-annually.

Cash reserves

The BRANZ Group has investment in cash reserves and corporate bonds of \$30.80 million as at 31 March 2019. This balance includes \$1.82 million of NSC 11 funding which has yet to be spent. The Board manages and allocates cash reserves across the key areas below. Over the next two to five years, the investment in capital assets will significantly reduce cash reserves to normalised operating levels. All funds and the level of cash reserves are held in accordance with the BRANZ Group investment and reserves policy.

Funding for investment in property, plant and equipment

BRANZ funds the maintenance and development of facilities, at Judgeford and elsewhere in New Zealand. A Campus and Asset Management Plan has been adopted by the Board to ensure that our facilities meet the industry research and testing needs for the future. The plan identified over 20 projects that are required to retire, replace and refurbish ageing property, plant and equipment over the next four to seven years.

In the next two to five years, around \$40-\$45 million of investment in this plan will be required. A detailed investment case is developed for each project in the plan. During the year, \$1.43 million was invested in projects which enable and support the wider redevelopment of the Judgeford campus. The projected level of cash reserves ensures that this work can be undertaken without seeking additional funding from industry or the government.

Critical and strategic industry issues

BRANZ also needs the ability to respond to critical issues affecting the industry. Provision of \$1 million is made in the cash reserves for this. For example, in the aftermath of the Canterbury earthquakes, BRANZ was able to draw on its reserves for critical issue funding even during a time when the Group was running a deficit.

During the year, BRANZ has continued to invest in a multi-year transformative software development initiative. Artisan is a quality assurance tool used as part of the residential building inspection process. It provides a workflow to capture real-time photographic evidence of the quality of work for critical elements of a build,

corresponding to the stage checks undertaken by Building Consenting Authorities (BCAs). Artisan is currently being deployed with two BCAs as part of a staged rollout approach and will be rolled out to additional BCAs during 2019/20. BRANZ has also taken a strategic role in leading the Industry Transformation Agenda and provided seed funding to support this initiative. Both these initiatives are supported from cash reserves.

Emergency operating costs

BRANZ also ensures that it holds enough cash in reserve to be able to have access to a minimum of three months of operating costs in the case of an emergency. This provision is currently \$5.9 million. Should the need arise, the case reserves would help to cover these funding requirements.

Cash float to fund day-to-day operations

BRANZ has cash float reserves in keeping with normal business practices. This currently stands at \$2.7 million. These funds are used to cover day-to-day activities.

Independent review

An independent review of our approach to reserves was commissioned in 2014 to ensure that the levels held are appropriate. The review noted that our approach is consistent and in line with other organisations similar to BRANZ.

Building Research Association of New Zealand Inc.

Summary Statements of Comprehensive Revenue and Expenses

For the year ended 31 March 2019

	Group	
	2019 \$	2018 \$
Operating income		
Revenue from non-exchange transactions		
Building Research Levy Act levies	21,528,415	19,828,287
National Science Challenge 11 (NSC11) funding	9,216,521	7,205,856
Revenue from exchange transactions		
Commercial work fees	8,217,471	7,568,867
	38,962,407	34,603,010
Other income		
Interest received	1,051,609	1,134,925
Gain on disposal of assets	0	1,911
	1,051,609	1,136,836
Total income	40,014,016	35,739,846
Expenditure		
Personnel costs	12,592,917	11,721,575
Other operating costs	23,839,267	20,596,302
Artisan Phase 1 development costs	1,453,475	0
Total expenditure	37,885,659	32,317,877
Surplus before income tax	2,128,357	3,421,969
Income tax expense	(96,171)	(185,650)
Surplus for the year	2,032,186	3,236,319
Total comprehensive income and expenses for the year	2,032,186	3,236,319

Building Research Association of New Zealand Inc.

Summary Statements of Changes in Net Assets/Equity

For the year ended 31 March 2019

	Group		
	Foreign currency translation reserve \$	Retained earnings \$	Total equity \$
Balance at 1 April 2017	29,920	37,862,934	37,892,854
Movement for year	(3,234)	3,236,319	3,233,085
Balance at 31 March 2018	26,686	41,099,253	41,125,939
Balance at 1 April 2018	26,686	41,099,253	41,125,939
Movement for year	(2,268)	2,032,186	2,029,918
Balance at 31 March 2019	24,418	43,131,439	43,155,857

Building Research Association of New Zealand Inc.

Summary Statements of Financial Position

As at 31 March 2019

	Group	
	2019 \$	2018 \$
Assets		
Current assets		
Cash and cash equivalents	4,004,444	3,264,387
Term deposits	23,250,000	23,680,000
Corporate bonds	3,543,285	3,479,493
Other current assets	4,182,206	3,700,443
Total current assets	34,979,935	34,124,323
Non-current assets		
Property, plant & equipment	11,720,688	11,599,260
Intangible assets	2,567,375	2,483,822
Deferred tax assets	0	41,909
Total non-current assets	14,288,063	14,124,991
Total assets	49,267,998	48,249,314
Liabilities		
Current liabilities		
Trade and other payables	2,903,004	1,673,673
Other current liabilities	3,060,348	5,324,357
Total current liabilities	5,963,352	6,998,030
Non-current liabilities		
Deferred tax liability	25,060	0
Other non current liabilities	123,729	125,345
Total non current liabilities	148,789	125,345
Total liabilities	6,112,141	7,123,375
Equity		
Total equity	43,155,857	41,125,939
Total equity and liabilities	49,267,998	48,249,314

Building Research Association of New Zealand Inc.

Summary Statements of Cash flows

For the year ended 31 March 2019

	Group	
	2019 \$	2018 \$
Net cash from/(used in) operating activities	3,029,232	3,585,585
Net cash from/(used in) investing activities	(2,289,175)	(3,728,426)
Increase/(decrease) in cash and cash equivalents	740,057	(142,841)
Cash and cash equivalents at 1 April	3,264,387	3,407,228
Cash and cash equivalents at 31 March	4,004,444	3,264,387

Building Research Association of New Zealand Inc.

Notes to the Summary Financial Statements

For the year ended 31 March 2019

1. Reporting entity

Building Research Association of New Zealand Incorporated (Inc.), “the Parent”, is an incorporated society registered under the Incorporated Societies Act 1908 and domiciled in New Zealand. The address of the Parent’s registered office is 1222 Moonshine Road, Judgeford, Porirua.

The consolidated summary financial statements of Building Research Association of NZ Inc. as at and for the year ended 31 March 2019 are presented and comprise the Parent and its subsidiaries (together referred to as the ‘Group’).

Building Research Association of NZ Inc.’s primary purpose is promoting scientific or industrial research for the building and construction industry.

These summary financial statements and the full financial statements were authorised for issue by the Board of Directors on 26 June 2019.

2. Basis of preparation

Statement of compliance

The summary financial statements are an abridged version of the full financial statements. Their purpose is to provide an overview and as such do not provide an understanding as complete as the full financial statements. The disclosures included in these summary financial statements have been extracted from the full financial statements.

The full financial statements have been prepared in accordance with generally accepted accounting practice in New Zealand (“NZ GAAP”). As the primary objective of the Parent and the Group is to promote scientific or industrial research for the building and construction industry, rather than for making a financial return, the Parent and the Group are public benefit entities for the purpose of complying with NZ GAAP. The financial statements of the Group comply with Public Benefit Entity Standards (PBE Standards).

Basis of Measurement

The summary financial statements are prepared on the historical cost basis. The accounts are prepared on a going concern basis.

Presentation currency

These summary financial statements are presented in New Zealand dollars (\$), which is the functional currency of the Parent and BRANZ Limited. BRANZ Pty Limited’s functional currency is Australian dollars.

Comparative Restatement

These summary financial statements are presented in New Zealand dollars (\$), which is the functional currency of the Parent and BRANZ Limited. BRANZ Pty Limited’s functional currency is Australian dollars.

3. Contingencies

The Group had no contingent liabilities as at 31 March 2019 (2018: none).

4. Related parties

Group entities	Country of incorporation	Ownership interest	
		2019 %	2018 %
BRANZ Limited	New Zealand	100	100
BRANZ Pty Limited	Australia	100	100

Building Research Association of NZ Inc. charges rent to BRANZ Limited for the use of property, plant and equipment as well as for its share of the Group CEO remuneration costs and other advisory services provided. In 2019 this amounted to \$2,016,240 (2018: \$1,819,200).

BRANZ Limited charges fees for research work and administration services carried out for Building Research Association of NZ Inc.

BRANZ Limited also charges Building Research Association of NZ Inc. for its share of the Group Executive Management Team costs, provision of accounting, IT, support, health and safety and quality services, and its share of insurance and marketing costs. In 2019 this amounted to \$12,661,582 (2018: \$12,405,877).

All charges are reviewed by the Board on an annual basis.

BRANZ contracts with construction and research organisations to which BRANZ directors are either related or are also directors. Transactions undertaken with these organisations are entered into on an arm's length basis. Where the director has proximity to the transaction, disclosure is made below.

During the year, BRANZ Inc. provided funding of \$3,220 (2018: \$10,000) to PrefabNZ Incorporated, of which Pamela Bell is Chief Executive and BRANZ Ltd sponsorship of \$6,900 to ProductSpec Ltd of which Richard Carver is a Director.

5. Segmental reporting

To provide greater transparency to the reader we have provided an analysis of the Group's core business and the National Science Challenge 11 (NSC 11) as provided below.

NSC 11 funds are paid to BRANZ Ltd on a quarterly basis by the Ministry of Business, Innovation and Employment. The funds received are held in deferred revenue on the Statements of Financial Position until recognised as revenue. Revenue is recognised in the Statements of Comprehensive Revenue and Expenses at the time expenses are incurred. The deferred revenue is recorded as a current liability as BRANZ has an obligation to return all funding not spent and for which contractual liabilities have not been incurred at the date of termination or finalisation of the contract.

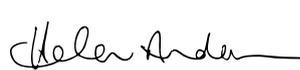
	Group		
	NSC 11 2019 \$	BRANZ 2019 \$	Total 2019 \$
Revenue	9,216,521	30,797,495	40,014,016
Expenses	(9,216,521)	(28,669,138)	(37,885,659)
Surplus before income tax	0	2,128,357	2,128,357
Prepaid expenses	412,864	391,931	804,795
Deferred revenue	(1,818,063)	(696,682)	(2,514,745)
Other net assets	(135,966)	45,001,773	44,865,807
Net assets/ (liabilities)	(1,541,165)	44,697,022	43,155,857

	Group		
	NSC 11 2018 \$	BRANZ 2018 \$	Total 2018 \$
Revenue	7,205,856	28,533,990	35,739,846
Expenses	(7,205,856)	(25,112,021)	(32,317,877)
Surplus before income tax	0	3,421,969	3,421,969
Prepaid expenses	382,527	401,597	784,124
Deferred revenue	(3,927,775)	(678,432)	(4,606,207)
Other net assets	0	44,948,022	44,948,022
Net assets/ (liabilities)	(3,545,248)	44,671,187	41,125,939

6. Subsequent events

No significant subsequent events have occurred after balance date.

These summary financial statements are approved for and on behalf of the Board of Directors by:



Helen Anderson
Board Chair
26 June 2019



Richard Carver
Chair, Audit and Risk
Management Committee
26 June 2019



Independent Auditor's Report

To the Members of Building Research Association of New Zealand Incorporated

Report on the Summary Financial Statements

The summary financial statements on pages 50 to 55, which comprise the summary statement of financial position as at 31 March 2019, the summary statement of comprehensive revenue and expenses, summary statement of changes in net assets/equity and summary statement of cash flows for the year then ended, and related notes, are derived from the audited consolidated financial statements of Building Research Association of New Zealand Incorporated (the "Incorporated Society" or the "Group") for the year ended 31 March 2019.

In our opinion, the accompanying summary financial statements are consistent, in all material respects, with the audited financial statements, in accordance with *FRS-43: Summary Financial Statements* issued by the New Zealand Accounting Standards Board.

Summary Financial Statements

The summary financial statements do not contain all the disclosures required for full financial statements under generally accepted accounting practice in New Zealand. Reading the summary financial statements and the auditor's report thereon, therefore, is not a substitute for reading the audited financial statements and the auditor's report thereon.

The Audited Financial Statements and Our Report Thereon

We expressed an unmodified audit opinion on the audited financial statements in our report dated 26 June 2019.

Directors' Responsibilities for the Summary Financial Statements

The Directors are responsible on behalf of the Group for the preparation of the summary financial statements in accordance with *FRS-43: Summary Financial Statements*.

Auditor's Responsibilities

Our responsibility is to express an opinion on whether the summary financial statements are consistent, in all material respects, with the audited financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing (New Zealand) (ISA (NZ)) 810 (Revised): Engagements to Report on Summary Financial Statements.

In addition to the audit we have provided agreed upon procedures. Partners and employees of our firm may deal with the Incorporated Society on normal terms within the ordinary course of trading activities of the business of the Incorporated Society.

26 June 2019
Wellington

Acknowledgements

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Larry Fink

Chairman and Chief Executive Officer
BlackRock Inc

Larry Fink is founder, Chairman and Chief Executive Officer of BlackRock Inc, a global leader in investment and technology solutions on financial futures. BlackRock, today, manages more money than any other investment firm in the world. Each year Larry Fink writes to the Chief Executives of the companies in which BlackRock invests.

This year he writes:

“As we enter 2019, commitment to a long-term approach is more important than ever – the global landscape is increasingly fragile and, as a result, susceptible to short-term behaviour by corporations and governments alike.”

He is adamant that purpose and social good is not a company's marketing tagline, but 'a company's fundamental reason for being'.



Levy investments in 2018/19

The Building Research Levy plays a key role in improving all aspects of New Zealand buildings. BRANZ is committed to ensuring New Zealanders receive the greatest possible benefits from Levy investment.

A core responsibility of BRANZ is effective stewardship of the Levy. This demands robust decision-making processes, a commitment to transparency and disciplined management of the Levy investments.



BRANZ's portfolio

Building and construction impact New Zealand's economy, environment and peoples' wellbeing. BRANZ, along with other research organisations, carries out research to better understand the nature of particular issues and how they interact to inspire the industry to provide better buildings for New Zealanders.

The graphic adjacent sets out key areas in which BRANZ undertakes research and its relative strengths (red shading), the depth of research effort across New Zealand (grey shading), and areas where research has opportunity for increased effort.

The Building Research Levy investments for 2018/19 follow. The total project value (operating and capital expenses) is given. Note: these amounts are subject to change.

For a full list of Levy-funded projects under way this year, refer to Levy in Action 2018/19.

Shaded content denotes projects led by external partners.

Total budget
\$

Research Investment

Medium-Density Housing (MDH) programme	
Building and maintaining MDH for long term performance	225,000
Community acceptance of MDH	320,000
Industry perspectives on medium-density consenting issues	86,990
Industry-identified technical issues facing MDH	162,000
MDH community acceptance	10,000
MDH construction quality survey	200,000
MDH for people and communities	200,000
MDH future buyers and renters	65,000
MDH info resource	110,000
MDH liveability	250,000
MDH post occupancy evaluations	200,000
MDH skills	150,000
Programme communication and knowledge transfer	50,000
Programme leadership	233,750
Residents' perspectives on maintaining MDH	120,000
Understanding resource consent processes in New Zealand	92,190
Who has the ability to deliver MDH?	190,000
Exceeding the minimum programme	
Accurately calculating thermal performance	98,265
Cost benefit analysis methodologies	150,000
Encouraging better building	100,000
Energy modelling methodologies	140,000
Exceeding the minimum for volume home builders and their clients	78,540
Financial incentives to exceed the minimum	64,925
Indoor air quality in new homes	53,000
Informed decision making on retrofitting insulation	98,500
LCAQuick - residential	213,000
Life cycle analysis framework dissemination	256,000
Measuring sustainability	155,500
Measuring the extent of thermal bridging in timber-framed walls	149,350
Performance of higher-specified windows	312,000
Programme communication and knowledge transfer	50,000
Programme leadership	206,564
Quantifiable evidence of going beyond the Building Code	204,000
Scholarship Sanjeev Ganda: Life cycle analysis of thermal envelopes	20,000
Scoping Workshop - framing and thermal bridging	7,850
Tools for young people to understand how they can improve home performance	99,880
Valuing sustainability in housing - stage one	469,000

Research Investment

Eliminating quality issues programme	
Adopting new ways	130,000
Clerk of works costs and benefits	55,000
Facilities management industry census	40,000
Knowing enough to ask	200,000
Measuring new-build quality	170,000
Persistence of weathertightness issues	150,000
Procuring for quality	230,000
Programme communication and knowledge transfer	58,000
Programme leadership	163,000
Scholarship Kimberley Russell: Identifying BIM procurement	20,000
The economic cost of quality defects	96,370
Warmer, drier and healthier buildings programme	
Air quality in high performance houses	148,000
Airtightness of apartments	650,000
Airtightness trends	400,000
Chemical contamination of building materials	800,000
Corrosion rates in vented roof cavities	187,000
Facade testing	410,000
Feasibility of an updated residential energy-use study	280,000
Fungal exposures in New Zealand homes	325,000
Growing up in New Zealand	720,840
Indoor environment and fungal exposure	183,000
Internal moisture verification method	90,000
Model buildings for the next generation of the New Zealand Building Code	1,600,000
New Zealand's experimental buildings	345,000
Occupant behaviour	430,000
Pollutant levels in modern homes	390,000
Programme communication and knowledge transfer	50,000
Programme leadership	650,000
Ridge and fascia vent design and performance	175,000
Risk assessment - retrofitting wall insulation	310,000
Risk assessment tool for roof ventilation	470,000
Roof design pathway	210,000
Roof ventilation calculator	150,000
Scholarship Jarred Butler: Impact of occupants on mould issue in New Zealand bathrooms	20,000
Scholarship Mike Bedford: Daycare environmental conditions	75,000
Scholarship Phoebe Taptiklis: Assessing the relative impact of poor home maintenance on interior dampness	75,000
School MonitoBox	100,000
Smart ventilation and indoor environmental quality	1,250,000
Ventilation performance in large span roofs	320,000

Research Investment

Total budget
\$

Development of new research programmes	
Development of a fire research programme	185,300
Low carbon economy programme	150,000
Built-environment carbon budget	185,000
Climate change in the building industry	94,800
Knowledge transfer and other core capability	
Advisory services	430,000
Annual Loss factor tool (ALF)	150,000
Annual publications review	32,000
BRANZ Levy forecasts	34,000
BRANZanswers - junctions	150,000
BRANZfind	56,400
BUILD magazine	883,000
Builders Mate	150,000
Building controls	320,000
Bulletin releases	174,000
Durability verification database	10,000
e-Learning	90,000
Good Practice Guide - waterproof decks	100,000
Guideline	30,000
Knowledge Transfer for standalone projects	300,000
LEVEL sustainability series	72,000
Library - information management	261,260
Maintaining ALF 3.2	40,000
Passive fire	70,000
Prefab modular construction roadshow	15,000
Seminar 1	150,000
Weathering site	30,000
Webinars live	24,000
Strategic initiatives	
Artisan * investment in 2018/19 only	1,712,940
Industry transformation agenda * investment in 2018/19 only	453,997
Standalone research	
Alternative tenure models	100,000
Applying blockchain to product compliance and assurance	178,875
ArchEngBuild 2018	61,970
ArchEngBuild 2019	98,000
Better post-disaster projections	100,000
BIM initiative * allocated investment in 2018/19 only	250,000

Research Investment	Total budget \$
B-RISK user support	73,000
Building a team with He Kainga Oranga	580,000
Building Basics – Insulation second edition	25,000
Building Basics – Internal moisture second edition	25,000
Building Basics – Minimising waste second edition	25,000
Building Basics – second edition	25,000
Building Basics – Steel framing second edition	25,000
Building Basics – Weathertightness second edition	38,000
Building energy end-use study (BEES 2 A)	60,000
Chip off the NEW block – blockchain in the construction sector	181,490
Compliance and assurance prototypes for manufactured buildings	50,000
Corrosion in the Bay of Plenty environment	665,000
Design, installation and seismic restraints of interior partitions and walls	92,000
Durability evaluation framework for innovative materials	570,000
Ensuring affordable concrete supply post-2020	110,000
Fire safety of combustible facades in New Zealand	1,030,000
Fire-safe use of timber construction II	1,120,000
Flood it – tiny building flood assessments	324,000
Foundations on sloping sites	60,000
Heat pump performance issues	80,000
House conditions survey – contributing to national housing quality data and information needs	1,302,500
House conditions survey data	160,850
Housing productivity measurement	24,000
Housing the future of New Zealand	50,000
How can New Zealand construction deliver low-impact to zero-impact buildings?	1,575,000
Identifying the trends – working towards suicide prevention for the construction industry	100,000
Intermediate market update	29,400
Level of research and development in the building and construction sector – scoping study	48,000
Materials performance testing methodologies	1,478,000
Mental health in construction	50,000
Monitoring industry performance	180,000
New building characteristics	400,000
New house owners’ satisfaction survey	250,000
Passive Fire Protection Quality	398,567
Performance and effectiveness of smoke management	125,560
Performance based fire safety engineering: limiting fire spread by design	1,629,000
Planning barriers for prefab	99,300
Positional material deterioration over building envelope	540,000
Precast floors	635,000

Research Investment

Total budget
\$

Preparing the foundation for risk-informed fire safety design	270,000
Quality preliminary investigation report	100,000
ReCast floors	1,053,161
Regional waste minimisation	175,000
Residential water use	656,468
Risk management strategies	191,000
ROBUST building system testing	50,000
Rochelle Ade: Performance of Homestar-rated homes	75,000
Scholarship Andrew Walmsley: Men's health and suicide prevention – an investigation into help seeking behaviour among men within the construction industry	75,000
Scholarship Armano Papageorge: Semi-autonomous off-site construction – mass customisable and structurally optimised building elements with freeform 3D printing	75,000
Scholarship Audsley Jones: Design and behaviour of buckling restraining braces	75,000
Scholarship Beth Noble: Artificial lighting systems that meet the needs of autism spectrum	75,000
Scholarship Cara Askew: Building management systems in non-residential buildings	20,000
Scholarship Dan Court-Patience: Connections in buckling restraining braces	70,000
Scholarship Emily Newmarch: Performance of thermal envelopes	20,000
Scholarship Gerard Finch: Defab – prefabricated architecture for a circular materials economy	75,000
Scholarship Glen Stricot-Tarboton: Robotic arm prefab panel	20,000
Scholarship Glen Stricot-Tarboton: Materials funding	12,369
Scholarship Jono MacIntyre: Predicting structural fire severity – an update	75,000
Scholarship Julia Thompson: Natural ventilation for large audience spaces	75,000
Scholarship Mikayla Heesterman: Robotic connections – customisable joints for timber construction	20,000
Scholarship Nicole Allen: Multi-volcanic hazard impact assessment for residential buildings in the Auckland volcanic field	75,000
Scholarship Olivia Whyte: Sustainable urbanism	20,000
Scholarship Peter Marriott: Fire safety design	20,000
Scholarship Sandi Sirikhanchai: Balancing building energy	20,000
Scholarship Tayler Hubber-Davis: Integrating augmented reality with building information modelling (BIM)	20,000
Scholarship Vicky Southworth: Stormwater management and water-sensitive urban design	20,000
Scoping BRANZ open data	10,000
Scoping research requirements for engineered wood products	120,000
Small-scale greywater	42,000
Specific design of light timber frame buildings	620,000
Structural adhesives	1,005,000
Timber design guides	100,000
Towards durable timber structures	400,000
Understanding the construction cost gap	22,000
Using COMSOL for building physics	80,000
WUFI - moisture modelling software	430,000

Thank you



Thank you

Helen

*I LOVE BEING INVOLVED WITH BRANZ.
I LIKE THE FACT THAT OUR PEOPLE
ARE DOING STUFF THAT MATTERS.*

Inspiring the industry to
provide better buildings
for New Zealanders.

BRANZ has achieved many successes in 2018/19 and none of these would have been possible without the active participation and support from so many. Our sincerest thanks go to everyone who has worked with, worked on, supported or helped us in any way.

In particular, a huge thanks to our staff whose expertise, best practices and commitment continue to build credibility for BRANZ through the immense value they add through their work.

I'd also like to acknowledge the guidance our Board provides and sincerely thank our Chair, Dr Helen Anderson, and all our Board members who so generously share their wisdom and experience.

To our stakeholders, clients and customers, thank you for your continued trust in us and for helping us to continue to meet the needs of the current and emerging challenges of the built environment.

BRANZ is part of a wider building and construction system that requires collaboration and leadership from all players. As a key player, we look forward to continuing to work in partnership with you all to build on this year's momentum and successes. We look forward to working with you as 2019/20 unfolds.

Chelydra Percy
Chief Executive Officer

Chelydra

*I THINK IF WE WERE TO SAY WHAT
WOULD SUCCESS LOOK LIKE. IT
WOULD BE ABOUT BRINGING THAT
VISION AND DRIVE AND JOY BACK
INTO THIS SECTOR.*

Helen

*THAT'S THE KIND OF FUTURE WE'RE
WORKING TOWARDS. NO SILVER BULLET
WHIZZING INTO VIEW. BUT A WHOLE HEAP
OF TALENT WHOSE VISION, INNOVATION,
SKILLS AND CREATIVE ENERGY GUIDE AND
DRIVE THE SECTOR.*



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