Industry perceptions of weathertightness issues in residential construction

Leaks in newly built homes are being reported as an ongoing problem in New Zealand. BRANZ has investigated industry perceptions about the topic and what they think contributes to the persistence of weathertightness problems. To ensure homes are weathertight, research suggests that change is required in how the industry operates. Industry feedback suggests that some of the mechanisms that guide industry functions actually create conditions that undermine building quality.

A number of recent studies have found evidence that weathertightness problems still exist in houses less than 10 years old, despite all the regulatory changes made since the mid-2000s.

This raises some questions:

- Do the problems today stem from the same causes as the leaky home crisis of the 1990s and early 2000s, or are there new contributing factors?
- Is the industry and the framework that governs it sufficiently robust to deal with the problem today?
- Do today's causes behind leaky houses extend beyond the reach of the procedural and technical controls of the Building Code?

The discussion of leaky homes here refers to flaws in how a residential dwelling was designed or constructed to deflect external moisture, leading to water unintentionally penetrating the building interior. This is different to occasional leaks in basically well-built houses from extremes of driving wind and rain. Weathertightness research links to BRANZ's broader aim to understand why quality issues persist in new builds, particularly where they are of high impact.

The research described in this fact sheet was conducted through an online survey (completed by 215 building professionals, including architects, builders, building surveyors, engineers and building inspectors), four focus groups involving 25 people and in-depth interviews with 13 key industry stakeholders.

The survey participants were asked whether they had witnessed issues with leaks in residential buildings less than 10 years old: 63.7% said yes, 36.3% said no. (A majority answered yes in every region of the country.)

The top four sources of leaks (nominated by over half the respondents) were wall and roof claddings and junctions and window/cladding junctions (Figure 1).

Industry-perceived causes for weathertightness issues

Incorrect installation, inadequate detailing, insufficient quality control and contractors in a rush were the main reasons why weathertightness issues persist (Figure 2), nominated by over half the respondents. In addition, 43% of survey participants also said that subcontractors may not ask for help if they are having problems with their work on site. This is potentially compounded by insufficient quality control processes on worksites. This suggests that the consequences of a lack of professionalism or capability amongst tradespeople may not be identified by on-site management.

Industry-perceived reasons for problems

Having identified the components that leak and the specific reasons behind the leaks, the research then looked for more fundamental issues that have allowed the situation to arise. Problems raised by industry practitioners fell broadly into three categories covering the industry, the regulatory system and consumers.

Perception 1: There are insufficient overall levels of skill, knowledge, quality and supervision in the industry:

- Contractors have varying levels of skill and professionalism.
- Designers have varying levels of practical building knowledge.
- There is too little independent observation of construction work. Part of this stems from consumers being unwilling to pay, part stems from legal liability concerns. Specifically, joint and several liability allows multiple parties to be held liable for an event that causes the client a loss, even if one or more of them was not the cause of the loss. This makes designers wary to go onto a building site unless they have a full contract that covers on-site observation.

Perception 2: The regulatory system is not encouraging quality:

- The regulatory environment focuses first on compliance, not building performance.
- Building consent authorities (BCAs) are perceived as being driven primarily by concerns around legal liability rather than building quality or performance. Industry practitioners say BCAs have a strong preference for Acceptable Solutions, seen as safer for them, and are reluctant to consider alternative methods that may actually give better performance.
- There is a widespread perception that the Licensed Building Practitioners (LBP) Scheme has failed to raise building quality. Low-skilled and dishonest building practitioners are seen as able to meet the licensing criteria, undercutting quality-focused builders and getting away with substandard work.

Perception 3: Clients are mostly concerned with cost:

- Many consumers focus on housing affordability rather than construction quality.
- Many consumers are unwilling to pay for anyone to supervise construction work.
- They often select low-cost contractors (who are often less capable).
- They often misperceive BCA inspections as a quality control or quality assurance mechanism.
- They have a poor understanding of value for money, allowing less-capable builders to gain a foothold in the market.

These perceptions suggest that ongoing weathertightness failure is partly the result of a systems failure in the building industry, part of which is beyond regulatory control. Table 1 sets out the problems identified, the impact they have and suggested solutions.

Figure 1. Which components of the building were responsible for water ingress (multiple choices possible).

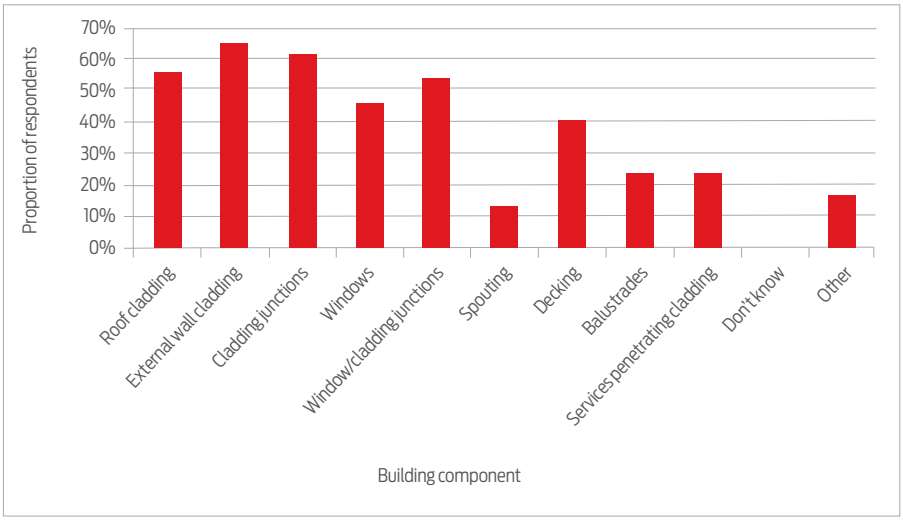
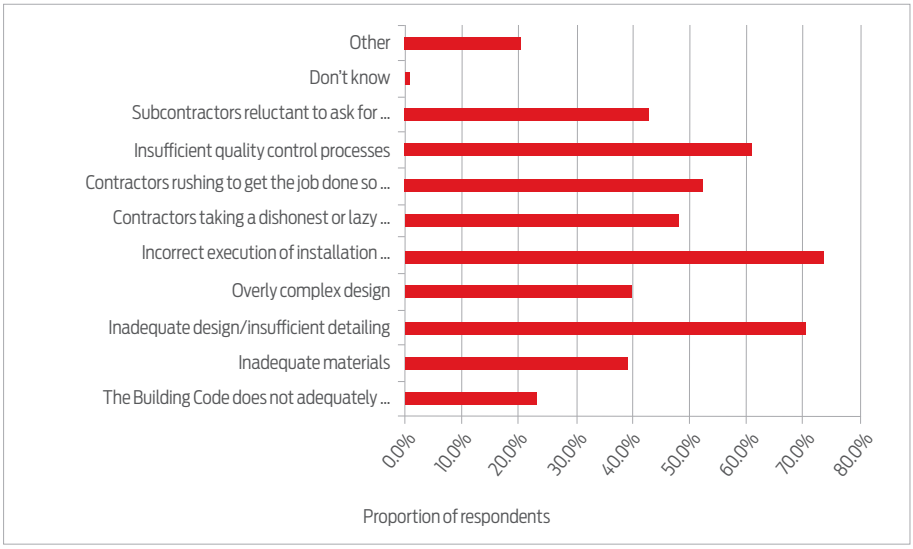


Figure 2. Reasons given why weathertightness issues persist in residential construction (multiple choices possible).



Industry-recommended solutions

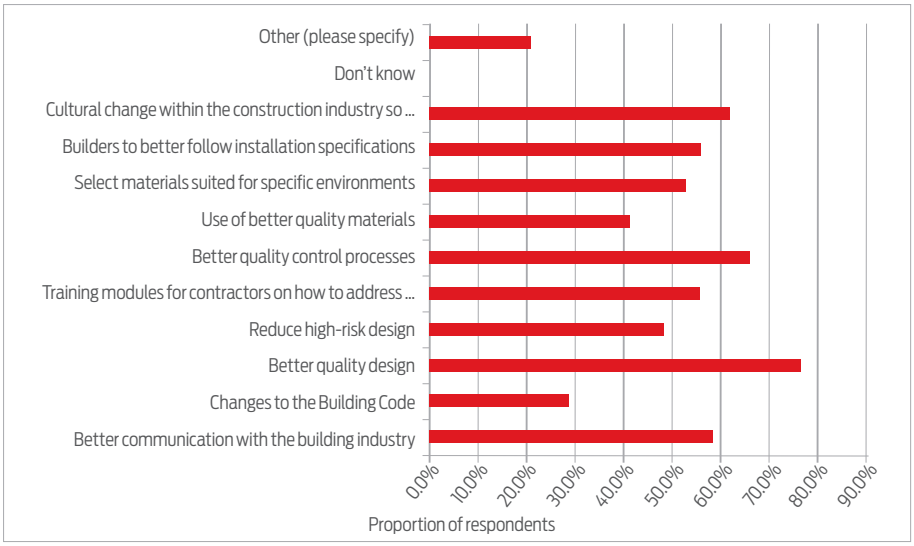
Survey participants were given 10 possible solutions (Figure 3). They could choose more than one option. Over 60% of respondents nominated:

- better quality design
- better quality control processes
- cultural change within the industry so that subtrades feel confident to ask for help when uncertain.

Other solutions added by respondents included:

- improved training and education for builders and designers
- improved detailing on plans
- improved liability schemes
- access to well-proven Alternative Solutions.

Figure 3. How should weathertightness issues in residential construction be addressed?



Conclusion

Despite significant regulatory changes from the mid-2000s on, weathertight issues appear to be a pressing concern for some in the industry. A survey of over 200 industry practitioners found that almost two-thirds of them had seen problems with weathertightness in houses less than 10 years old.

The problem is seen as the result of many interrelated factors, including:

- underskilled and time-poor contractors, sometimes working from insufficient designs
- variable practical building knowledge among designers and a reluctance to go on site when not contracted to reduce the risk of liability
- a licensing scheme that is not working as intended
- regulatory and legal environments focused on compliance and minimising liability rather than building performance and quality
- consumers who focus on cost above quality, who don't pay for on-site supervision and who misinterpret the controls system as a quality assurance scheme.

Just as the causes are many, so are the suggested solutions:

- Educate consumers about the consequences of their procurement decisions, the importance of site supervision and how to understand value for money.
- Replace joint and several liability with proportional liability, where parties are held liable in proportion to their fault.
- Improve designer training, with more on-site experience and a greater understanding of buildability.
- Improve builder training.
- Introduce more Acceptable Solutions and make well-proven Alternative Solutions more available.
- The LBP Scheme should maintain high qualification standards, registering as an LBP should be mandatory for all trades and the LBP complaint system should weed out those not performing to the expected level.

Further reading

Nuth, M. (2020). *Industry perceptions of weathertightness failure in residential construction*. BRANZ Study Report SR442. Judgeford, New Zealand: BRANZ Ltd.

www.weathertight.org.nz

Time to review E2/AS1, *Build* 166, June/July 2018

Table 1. Problems identified by the industry that contribute to poor weathertightness.

Industry-identified problem	Industry-identified issue	Industry-identified impact	Industry-recommended solution
Consumer price sensitivity	Building quality is influenced by price-sensitive consumers. Some clients prefer low-cost contractors.	Increases the likelihood of less-experienced/capable builders winning contracts and dictating market conditions.	Educate clients on the benefits of hiring an independent consultant to observe construction on their behalf.
	Clients cut out construction monitoring from architects' contracts to save money.	Lack of independent oversight of underskilled workers.	
Joint and several liability	Architects reluctant to act as quality assurers on site from concerns around liability unless engaged on a full contract.	Risk of liability can act as a disincentive for architects to visit building sites on behalf of their clients if not on a full contract.	Introduce proportional liability. Increase the number of Acceptable Solutions in Building Code clause E2.
	Fear of liability is driving negative behaviours in BCAs in how they assess consent applications.	Owing to the risk of liability, BCAs are seen to prefer E2 Acceptable Solutions even if they are not suitable, forcing designers to use solutions that give poorer performance.	
Design quality	A lack of practical building knowledge among some designers.	A lack of practical knowledge can make it difficult for architects to understand what information builders need to turn design concepts into reality. This undermines the buildability of designs.	Increase architects' knowledge base by increasing the degree of on-site experience graduate architects receive during their education. Introduce a builder's perspective to design before construction. Increase use of 3D drawings.
Poor contractor execution of installation specifications	There is a market for less-skilled contractors and those who rely on ways of working based more on old habits than keeping up with industry standards.	Poor product installation leading to weathertightness failure.	Reform the current apprenticeship training scheme covering who can teach, what is being taught and how it is being taught. Combine the training of professions to allow for greater cohesion and understanding in industry around weathertightness implementation.
	Contractors often do not have the time to fully review product installation specifications before starting work.	Poor product installation leading to weathertightness failure.	Tailor information to meet the needs of tradespeople who lack time to read complex resources that are difficult to obtain. Promote greater use of digital technology. Promote greater integration of mobile apps so information is easier to find.
Limited quality assurance	The LBP Scheme has been largely ineffective at raising building standards.	There are low-skilled or dishonest builders who have met licensing criteria and get away with substandard work.	Reform the LBP Scheme to better ensure Code compliance and raise overall building quality and guarantees that industry members are accountable for their work.