

Relocating houses

Over a third of the houses removed following damage in the 2023 Auckland floods have been relocated. Relocation is preferred over deconstruction or demolition as it reduces waste going to landfill and provides a home for a new household.

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Aotearoa New Zealand's housing stock is generally well constructed to handle relocation. 'Wooden-framed houses are great candidates for moving,' says David Carradine, a senior engineer and Structures Team Leader at BRANZ. He points to BRANZ research where the resilience of timber-framed homes and school buildings has been physically tested to confirm the engineering view that timber-framed buildings have strength greater than calculations might suggest.

Across the country, relocations involve both recycling existing houses and moving new transportable homes to their final location. For recycled houses, weatherboard homes are often moved intact or cut into two or three parts. Where brick veneer homes are moved, the bricks are taken down before the move. (If brick veneer walls are required in the new location, a continuous foundation will be needed.)

Most recycled homes were originally set on pile foundations but homes on slab foundations can also be relocated, with the house being disconnected from the slab first.

Site selection

Both the intended site for the relocated



house and the access to it need to be suitable. Contact a relocation company to check site suitability and talk with insurers to check they will insure the house in the new location. In some cases, a geotech report will be required for the site, which ideally will have good solar access and low risks of flooding, landslides or other hazards.

Some new subdivisions impose covenants that do not allow relocation of a second-hand house. Building consent authorities (BCAs) may also have their own specific restrictions.

Building Code requirements and building consent

Section 17 of the Building Act requires that all building work must comply with the Building Code to the extent required by the Act. 'Building work' includes work typically involved with relocations such as the construction of timber pile foundations, drainage and stormwater connections or on-site treatment/disposal.

The relocated building does not need to be entirely brought up to current Building Code requirements.

- Relocating a building onto or within a site does not by itself constitute building work. (MBIE Determinations 2021/005 4.2.3 and 2019/047 4.3.4).
- Section 112 of the Building Act covers building work that relates to alterations to an existing building. For certain provisions (means of escape from fire, access and facilities for people with disabilities), altered buildings must comply 'as near as is reasonably practicable' with the Building Code. In all other respects, the altered building must continue to comply with the Building Code to at least the extent that it did before the alterations.
- For work following the relocation, the BCA is only required to be satisfied that the new building work will comply with the Building Code and that proposed alterations would not reduce any level of Code compliance that the building already has. A building consent will usually be required. The BCA will need to see plans for new building work that needs consent (such as foundations) that comply with the new location's performance requirements for structure and durability. This will include consideration of:
 - wind zone – especially if the house is moving from a lower wind zone to a higher wind zone
 - earthquake zone – especially if the house is moving from a lower earthquake zone to a zone of higher risk
 - exposure (corrosion) zone – especially if the new location is coastal, where stainless steel foundation fixings will be required.

For homes built or altered in the past 40 years or so, the local council will often hold records of the bracing design plan. This can help with calculating whether additional bracing is required for the site.

There are often no detailed records for houses older than this (that pre-date NZS 3604:1978 *Code of practice for light timber frame buildings not requiring specific design*). BRANZ has helpful resources:

- *Evaluating walls for their bracing value in Build 199.*
- BRANZ Study Report SR305 *Bracing ratings for non-proprietary bracing walls.*

- BRANZ Study Report SR119 *Full-sized house cyclic racking test.*

Other Building Code requirements

The relocated building will also need a building consent for the new plumbing, drainage and stormwater connections to council services (or on-site wastewater treatment/stormwater disposal). Other Building Code clauses will need to be addressed where applicable, including:

- C *Fire safety*, requiring the installation of interconnected smoke alarms (this applies to alterations as well as new building work)
- D1 *Access routes*, for public access to the building and stair design
- F2 *Hazardous building materials*, for glazing (only if altered), for example
- F4 *Safety from falling*, for barriers around new decks, for example
- H1 *Energy efficiency*, for thermal performance requirements in new building work.

In some cases, a resource consent for the move may be required but not where relocating a house is a permitted activity in the district plan.

Some BCAs have their own requirements around relocating second-hand buildings. For example, Auckland Council requires a written report from a third party that includes details of the structural integrity and condition of the building, how it will be relocated, whether asbestos is present and whether fumigation will be required.

In some cases, councils may ask for a bond if the house is not scheduled to be reinstated within the permitted timeframe in the district plan. The bond would be repaid after agreed work is completed. Councils also commonly charge development costs or building impact fees.

Finding information

NZS 3604:2011 *Timber-framed buildings* has details about site requirements (section 3), exposure zones (4.2), wind bracing demand (5.2) and earthquake bracing demand (5.3). The Acceptable Solutions and Verification Methods for Building Code clause B1

Structure also have a definition of good ground. Climate zones for calculating thermal performance can be found in Acceptable Solution H1/AS1.

For any specific location, BRANZ Maps identifies the earthquake zone, corrosion zone, climate zone and maximum expected rainfall intensity.

Good design

Relocating a home is an opportunity for optimising the orientation of the building on site for passive solar and ventilation design and a more comfortable and resilient home with lower operating costs. For passive warmth, this means a shallow floor plan that is wide, not deep, with an east-west orientation and the living areas facing north. Avoid overheating by using eaves and with good ventilation.

House relocation companies

There are around 45 haulage companies that regularly relocate houses, says Jonathan Bhana-Thomson, Chief Executive of the New Zealand Heavy Haulage Association. In many cases, the relocation company moves the home and also constructs the timber pile foundations. He points out that, as most new homes are built on concrete slabs, relocation firms have more experience at building timber pile foundations than homebuilders.

For the relocation, choose an experienced company and have a contract. Work out who is responsible for each job, including:

- site investigations and commissioning a geotech report if required
- obtaining building consent
- designing and constructing the pile foundations
- insurance for the move – haulage companies have good access to insurance cover – and contract works cover.

Jonathan Bhana-Thomson says relocating a recycled house to a new site can have an all-up cost of just two-thirds that of building new. With a shortage of affordable homes and high levels of waste in the building sector, relocation rather than demolition is a good road to take. ◀