

# General information on building safety in earthquakes

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A general overview of building safety in earthquakes, for building owners and managers.

## Following a major event

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If there has been a major event, the building owner is primarily responsible for ensuring their building is safe. Use the following resources:

- [Post-emergency building assessment \(https://www.building.govt.nz/managing-buildings/managing-buildings-in-an-emergency/\)](https://www.building.govt.nz/managing-buildings/managing-buildings-in-an-emergency/) has a range of resources
- [Building owner and manager post-emergency \(https://www.building.govt.nz/managing-buildings/managing-buildings-in-an-emergency/information-for-building-owners/\)](https://www.building.govt.nz/managing-buildings/managing-buildings-in-an-emergency/information-for-building-owners/) guide explains your legal obligations.

## Everyday building owner responsibilities

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If you have concerns about how your building would perform in the event of an earthquake, you should seek professional engineering advice and develop a plan to mitigate risk.

There are some situations where you, as the building owner, may be legally required to undertake a structural upgrade of your building:

- when the building's use is going to be changed – you must notify the council. You may have to obtain a building consent and you may have to comply with additional requirements to upgrade the building under the Building Code relating to means of escape from fire (typically fire exits and alarms), sanitary facilities and access for people with disabilities.

[Change of use \(https://www.building.govt.nz/managing-buildings/change-of-use-and-alterations/\)](https://www.building.govt.nz/managing-buildings/change-of-use-and-alterations/) explains in more detail.

- if the building is dangerous, insanitary or earthquake-prone - an 'earthquake-prone building' is one that has been assessed as being earthquake-prone by the council. This is commonly interpreted as a structure that is less than one-third of the current new building standard (%NBS) for earthquake strength design and is likely to collapse in a moderate earthquake.

Our increasing knowledge and understanding of the seismicity of New Zealand, material properties and the response of buildings to earthquake shaking, is reflected in the regulatory system governing building.

The Building Act and Building Code focus on life-safety in regard to earthquakes – they accept buildings may be damaged. The system looks to achieve balance so that the risks from buildings are managed appropriately and proportionately to cost and practicality.

How a building responds in an event depends on a unique combination of factors – the land conditions, the type of earthquake (such as its duration, accelerations and velocity), and the building's structural and non-structural composition.

Following the Hurunui/Kaikōura earthquakes in November 2016, GNS Science advised there is an increased risk of further earthquakes occurring in the next 12 months in areas that include Wellington, Lower Hutt City, Marlborough and Hurunui. Owners of unreinforced masonry (URM) buildings in those areas will be notified by their council and are required to secure the street-facing parapets and facades on their buildings within 12 months of the date of the notice. The parapets and facades must be secured within this time frame to reduce the risk of falling masonry.

[Securing unreinforced masonry building parapets and facades \(https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/securing-parapets-facades-unreinforced-masonry-buildings/\)](https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/securing-parapets-facades-unreinforced-masonry-buildings/) has further information.

## Take action – deal with structural concerns

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If you are concerned about your building, don't wait for your council to act before dealing with any structural concerns.

Owning an earthquake-prone building doesn't necessarily mean your building should not be occupied. But it does mean you should get a professional engineering assessment as soon as you can, and then work out a plan to fix any identified problems over a reasonable time period.

You can follow the three steps below as a guide:

### 1. Prioritise building assessment

You will need to engage professional engineering advice early on, particularly if your building is used frequently by a large number of people and is a higher-risk type (such as unreinforced masonry).

### 2. Find out everything you need to know to assess risk

Get professional engineering advice on:

- the structural strength of the building – identify any features, critical structural weaknesses or defects that may be risky
- any strengthening work already done
- possible short-term actions that may decrease risk
- other longer-term strengthening measures, consistent with council policy and your circumstances and plans.

### 3. Decide what action to take

- choose the option that provides the best 'fix' and meets council needs
- talk to your tenants about how best to do any strengthening work needed, within a reasonable timeframe
- if necessary, close parts or all of the building pending repair.

The costs of any work to reduce or remove danger are likely to depend on:

- the structural characteristics of the building
- the degree of any deficiencies
- the nature and extent of any remedial work required.

[Earthquake-prone buildings \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/) has related information.

If you're a building owner in Canterbury, you may wish to refer to specific technical guidance issued to assist design engineers involved with the rebuild.

[Canterbury rebuild \(https://www.building.govt.nz/building-code-compliance/canterbury-rebuild/\)](https://www.building.govt.nz/building-code-compliance/canterbury-rebuild/) has more information.

## Take action – non-structural building elements

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Good performance of non-structural building elements in earthquakes can save lives and costs, and building owners should be satisfied of their safety.

Non-structural elements are those elements within a building that are not considered to be part of either the primary or secondary structural systems. Examples include components such as mechanical and electrical plant, ducting, pipework, cable trays, suspended ceilings, light non-load bearing partitions and cladding systems such as brick veneer.

Get professional advice from an engineer or the appropriate service providers (for example, you may contract service providers to perform regular Building Warrant of Fitness checks).

[Practice Advisory 19: Improving earthquake performance of non-structural elements \(https://www.building.govt.nz/building-code-compliance/b-stability/b-1-structure/practice-advisory-19/\)](https://www.building.govt.nz/building-code-compliance/b-stability/b-1-structure/practice-advisory-19/) provides greater detail for building owners and engineers.

[Earthquake-prone buildings \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/) provides related information.

[Fix. Fasten. Don't Forget](http://www.eqc.govt.nz/fixfasten?gclid=CN6zzIaK69ECFYUHvAodNU4PsQ) (<http://www.eqc.govt.nz/fixfasten?gclid=CN6zzIaK69ECFYUHvAodNU4PsQ>) on the EQC website provides practical tips for your home.



New Zealand Government

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