

How the system for managing earthquake-prone buildings works

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The system for managing earthquake-prone buildings targets buildings and parts of buildings that pose the greatest risk to public safety or other property in a moderate earthquake event.

The national system ensures the way buildings are managed for future earthquakes is consistent and strikes a balance between the following:

- protecting people from harm in an earthquake
- the costs of strengthening or removing buildings
- the impact on New Zealand's built heritage.

The diagram below shows the factors that are taken into account.



Overview of the system

Under the new system for managing earthquake-prone buildings territorial authorities, engineers and building owners have key roles to play.

These are set out in the Building Act and can be summarised as:

- territorial authorities identify potentially earthquake-prone buildings
- owners who are notified by their territorial authority must obtain engineering assessments of the building carried out by suitably qualified engineers

- territorial authorities determine whether buildings are earthquake prone, assign ratings, issue notices and publish information about the buildings in a public register
- owners are required to display notices on their building and to remediate their building.

The Building Act also divides New Zealand into three seismic risk areas – high, medium and low.

There are set time frames, based on these seismic risk areas. They include time frames for territorial authorities to identify potentially earthquake-prone buildings and for building owners to remediate earthquake-prone buildings.

There is also a category of ‘priority buildings’ in high and medium seismic risk areas. These are buildings that are considered higher risk because of their construction, type, use or location. They must be identified and remediated in half the time allowed for other buildings in the area.

The system will also ensure information about earthquake-prone buildings is publicly-accessible through the EPB register.

For more information on the steps in the process of identifying, assessing and making decisions on earthquake-prone buildings you can read:

- [Identifying potentially earthquake-prone buildings \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/identifying-earthquake-prone-buildings/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/identifying-earthquake-prone-buildings/)
- [Assessing potentially earthquake-prone buildings \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/assessing-potentially-earthquake-prone-buildings/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/assessing-potentially-earthquake-prone-buildings/)
- [Deciding if a building is earthquake-prone \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/deciding-building-earthquake-prone/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/deciding-building-earthquake-prone/)
- [Applying the outcome of the decision \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/applying-outcome-of-decision/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/applying-outcome-of-decision/)

Legal documents and tools to support the system

The core legal documents and tools that support the system are described below.

Building Act 2004

- the core framework for managing earthquake-prone buildings – major changes to this framework took effect from 1 July 2017 (through an Amendment Act)
- defines an earthquake-prone building (in a revised definition that clarifies certain aspects, including the application to parts of a building)
- sets out exclusions from the scope of the earthquake-prone buildings provisions
- makes certain provisions for heritage buildings

The [Building Act 2004 \(http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html\)](http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html) is available on the Legislation website.

Regulations (about earthquake-prone buildings)

- provide more detail about how to meet certain requirements under the Building Act
- define ‘ultimate capacity’ and ‘moderate earthquake’, two terms in the Building Act definition of an earthquake-prone building
- establish the categories for earthquake ratings and the form of EPB notices
- include criteria for territorial authorities considering whether alterations to earthquake-prone buildings trigger the requirement to complete seismic work
- identify characteristics a building must have to be granted an exemption from seismic work
- identify some new offences and fees for actions relating to earthquake-prone buildings

[Building \(Specified Systems, Change the Use, and Earthquake-prone Buildings\) Regulations 2005 \(http://www.legislation.govt.nz/regulation/public/2005/0032/latest/DLM313966.html\)](http://www.legislation.govt.nz/regulation/public/2005/0032/latest/DLM313966.html) on the Legislation website has more information.

[Building \(Infringement Offences, Fees, and Forms\) Regulations 2007 \(http://www.legislation.govt.nz/regulation/public/2007/0403/latest/whole.html\)](http://www.legislation.govt.nz/regulation/public/2007/0403/latest/whole.html) on the Legislation website has information about fees and offences.

EPB methodology

- set by the chief executive of MBIE under the Building Act (a new document which took effect from 3 July 2017)
- sets out how territorial authorities identify potentially earthquake-prone buildings, how engineers undertake engineering assessments, and how territorial authorities determine whether a building or part is earthquake prone, and if it is, its earthquake rating
- incorporates the Engineering Assessment Guidelines by reference

[The methodology to identify earthquake-prone buildings \(https://www.building.govt.nz/b1-structure/methodology-identify-earthquake-prone-buildings/\)](https://www.building.govt.nz/b1-structure/methodology-identify-earthquake-prone-buildings/) has more information.

Engineering Assessment Guidelines

- provide engineers with the framework and technical methods they are required to use in undertaking assessments
- a full revision of the 2006 seismic assessment guidelines (also known as the 'red book') that incorporates new knowledge and research in earthquake engineering assessment methods

[The Seismic Assessment of Existing Buildings: Technical Guidelines for Engineering Assessments. \(https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/seismic-assessment-existing-buildings/\)](https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/seismic-assessment-existing-buildings/)

EPB register

- a national, publicly accessible register of buildings determined to be earthquake prone, and their earthquake ratings
- will be added to progressively as buildings are determined as earthquake-prone

[Register of earthquake-prone buildings \(EPB register\) \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/epb-register/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/epb-register/)

Buildings and parts of buildings covered by the earthquake-prone building provisions

The system focuses on the most vulnerable buildings, in terms of public safety.

The earthquake-prone building provisions apply to non-residential buildings and some larger residential buildings – those that are at least two storeys and either:

- contain three or more household units, or
- are used as a hostel, boarding house, or other specialised accommodation.

Some buildings are specifically excluded, including farm buildings, retaining walls, fences, certain monuments, wharves, bridges, tunnels and storage tanks.

[The Building Act 2004 \(http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html\)](http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html) has full details.

Farm buildings

Farm buildings are specifically excluded because of the expected low consequence of failure of these types of buildings.

Farm buildings are those buildings, on farms, that are primarily used for farming activities or an ancillary purpose. Examples of the types of buildings that can be considered as farm buildings are stables, wool sheds, cow sheds, hay barns, herd homes, implement sheds, milking sheds, fattening units, ancillary buildings and storage buildings.

Buildings on farms that are not related to farming activities should not be considered as farm buildings.

Buildings on farms that are more akin to industrial or manufacturing type facilities should not be considered as farm buildings, for example, manufacturing plants, packhouses, and vineyards. However, as these facilities are generally modern buildings, they are unlikely to be earthquake-prone.

Parts of buildings

A whole building or a part of a building can be earthquake prone.

This means that engineers assessing potentially earthquake-prone buildings need to consider vulnerable parts of buildings, such as unreinforced masonry parapets, as well as the overall performance of the whole building.

A part is an individual building element – such as a unreinforced masonry parapet – which would pose a life safety hazard if it fell or caused another building element to fall during a moderate earthquake.

[The methodology to identify earthquake-prone buildings \(https://www.building.govt.nz/b1-structure/methodology-identify-earthquake-prone-buildings/\)](https://www.building.govt.nz/b1-structure/methodology-identify-earthquake-prone-buildings/) sets out how engineers are required to consider and report on parts of buildings when undertaking an engineering assessment.

Seismic risk areas and time frames

The system categorises New Zealand into three seismic risk areas – high, medium and low. These are defined using the ‘Z’ factor, which is the seismic hazard factor for each area of New Zealand. The Z factor is used when designing new buildings to comply with the Building Code.

These seismic risk areas are used to set time frames for identifying and remediating earthquake-prone buildings.

Territorial authorities have set time frames to identify potentially earthquake-prone buildings using the profile categories in the EPB methodology.

Owners of earthquake-prone buildings are required to take action to remediate their buildings within certain time frames depending on the seismic risk area their building is located in.

Seismic risk areas – example locations

Seismic risk area	Z factor	Example locations
High	$Z \geq 0.3$	Gisborne, Napier, Hastings, Palmerston North, Wellington, Blenheim, Christchurch
Medium	$0.15 \leq Z < 0.3$	Tauranga, Hamilton, Rotorua, New Plymouth, Whanganui, Nelson, Timaru, Invercargill
Low	$Z < 0.15$	Northland, Auckland, Oamaru, Dunedin

Map of seismic risk areas – indicative only

Map of seismic risk areas – indicative only

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Download the map of seismic risk areas [PDF 1.1MB] (<https://www.building.govt.nz/assets/Uploads/managing-buildings/earthquake-prone-buildings/seismic-risk-areas-map.pdf>)

Z-values to determine seismic risk (<https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/z-values-seismic-risk/>) specifies the Z factor for each location.

Timeframes for action

Seismic risk area	TAs must identify potentially earthquake-prone buildings by:		Owners of earthquake-prone buildings must carry out seismic work within (time from issue of EPB notice):	
	Priority	Other	Priority	Other
High	1 Jan 2020	1 July 2022	7.5 years	15 years
Medium	1 July 2022	1 July 2027	12.5 years	25 years
Low	N/A	1 July 2032	N/A	35 years

Progress report (2019) - identifying potential EPBs in high and medium seismic risk areas

The Building Act 2004 requires all territorial authorities (TAs) in high seismic areas to report annually to MBIE on their progress in identifying potential

<http://mbie5.cwp.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/>

Progress toward

Progress toward

earthquake-prone buildings (EPBs).

In 2019, which is the second year of reporting, all 62 TAs from high and medium seismic-risk areas reported on progress, as required.

All potential priority earthquake-prone buildings in 19 of the 38 high seismic-risk areas have been identified by the TA. One-third of the medium seismic-risk areas have identified all of their potential priority earthquake-prone buildings ahead of their deadline of 1 July 2022.

TAs will continue consultation and requesting engineering assessments from building owners where needed, and MBIE will work with TAs to enable them to meet their EPB requirements.

Infographic identifying potentially earthquake-prone buildings high risk areas

Identifying potentially earthquake-prone buildings high risk areas



Download a copy of the summary infographic report [PDF 296KB] (<https://www.building.govt.nz/assets/Uploads/managing-buildings/earthquake-prone-buildings/identifying-potentially-earthquake-prone-buildings-high-risk-areas-2019.pdf>).

Priority buildings (high and medium seismic risk areas)

Priority buildings are certain types of earthquake-prone buildings in high and medium seismic risk areas that are considered to present a higher risk because of their construction type, use or location.

Priority buildings need to be identified and remediated within half the time available for other buildings in the same seismic risk areas.

There are two key categories of priority buildings:

- those that are prescribed in the Building Act, which include certain hospital, emergency and education buildings
- those that are described in the Building Act and determined with community input, which include parts of unreinforced masonry buildings that could fall in an earthquake onto a thoroughfare with sufficient pedestrian or vehicle traffic to warrant prioritisation, and buildings that could impede transport routes of strategic importance if they were to collapse in an earthquake. Councils will need to undertake public consultation to decide with their communities which routes or thoroughfares this should apply to.

Priority Buildings: a guide to the earthquake-prone building provisions of the Building Act (<https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/priority-buildings-earthquake-prone/>) provides guidance on identifying priority buildings.

The Building Act 2004

(<http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html>) on the Legislation website has more information on priority buildings.

Public information about earthquake-prone buildings

Information about earthquake-prone buildings will be publicly displayed on the buildings themselves and available in an online register.

<http://mbie5.cwp.govt.nz/managing-buildings/managing-earthquake-prone-buildings/how-the-system-works/>

identifying potentially earthquake prone buildings 2018

[PDF 1.1 MB]

(<https://www.building.govt.nz/assets/Uploads/managing-buildings/earthquake-prone-buildings/progress-toward-identifying-potentially-earthquake-prone-buildings-2018.pdf>)

Download the full report.

identifying potentially earthquake prone buildings 2019

[PDF 1.4 MB]

(<https://www.building.govt.nz/assets/Uploads/managing-buildings/earthquake-prone-buildings/progress-toward-identifying-potentially-earthquake-prone-buildings-2019.pdf>)

Download the full report.

Earthquake-prone buildings: Priority buildings

[PDF 268 KB]

(<https://www.building.govt.nz/assets/Uploads/managing-buildings/earthquake-prone-buildings/epb-priority-buildings.pdf>)

Overview of priority buildings.

EPB notices must be placed on all buildings that are determined to be earthquake prone. These notices contain the building's earthquake rating (where available) and the deadline for it to be remediated.

The information must also be entered in a public register of earthquake-prone buildings which is maintained by MBIE. Information is entered by territorial authorities and will build up progressively as territorial authorities determine which buildings are earthquake prone.

[Register of earthquake-prone buildings \(EPB Register\) \(https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/epb-register/\)](https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/epb-register/) is the public portal to the register.



New Zealand Government

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