

# Earthquake-Prone Buildings Policy



Responsibility:	Group Manager Environmental Development
First Adopted:	22 June 2006 (307/06)
Review Date:	June 2011
Review Frequency:	Five yearly, or as required

## Policy Objectives

The objectives of the Policy are to;

- Reduce the level of earthquake risk to people.
- Target the most vulnerable buildings.
- Strengthen buildings in a timely and cost effective manner.
- Reduce the risk to the community of failure in its built infrastructure.

## Principles

In setting this policy Council has endeavoured to strike a balance between the threats posed by Earthquake Prone Buildings and the broader social and economic issues affecting the community that are involved.

## Definitions

### Earthquake-Prone Building (EPB)

Under the Building Act 2004 (the Act): Section 122:

- (1) *A building is earthquake prone for the purposes of this Act, if having regard to its condition and to the ground on which it is built, and because of its construction, the building –*
  - (a) *will have its ultimate capacity exceeded in a moderate earthquake (as defined in the regulations); and*
  - (b) *would be likely to collapse causing –*
    - (i) *injury or death to persons in the building or to persons on any other property; or*
    - (ii) *damage to any other property.*
- (2) *Subsection (1) does not apply to a building that is used wholly or mainly for residential purposes unless the building-*
  - (a) *comprises 2 or more storeys; and*
  - (b) *contains 3 or more household units.*

This definition covers more buildings and requires a higher level of structural performance of buildings than was required under the Act.

## **Earthquake Zone**

New Zealand is zoned according to the earthquake risk. A map showing the zones can be viewed in NZS 3604:1999 Timber Framed Buildings – Figure 5.4 – Earthquake Zones.

## **Moderate Earthquake**

The definition of a moderate earthquake in relation to a building has been defined in the Building Regulations as:

*An earthquake that would generate shaking at the site of the building that is the same duration as, but that is one-third as strong as, the earthquake shaking (determined by normal measures of acceleration, velocity and displacement) that would be used to design a new building at the site.*

## **Owner**

The meaning of Owner in this policy has the same meaning as in the Act.

# **Background**

This policy has been prepared by Council to comply with Section 131 of the Act. Section 131 requires that each Territorial Authority prepares a Policy on Earthquake-Prone Buildings and to have this in place by 31 May 2006. The policy has been developed after due consultation with the South Waikato community and interested stakeholders. A draft policy was publicly notified according to the special consultative procedures required under the Act. The community and stakeholders were invited to make written submissions and to speak to their submissions at a hearing before Council.

In preparing this policy Council has chosen to adopt a moderate approach of inspecting buildings to coincide with its annual inspection regime of Building Warrants of Fitness (BWofF) audits and a desktop study. This is a less rigorous approach than inspecting the entire stock of buildings.

Earthquake risk in the South Waikato District varies between north and south. The area generally north of Tokoroa is in the medium earthquake zone B, and the southern area (that borders the active seismic area through Taupo – Rotorua) is in the high earthquake zone A as described in NZS 3604:1999 Timber Framed Buildings – Figure 5.4 – Earthquake Zones. There are different construction standards in the different earthquake zones.

Buildings in the District comprise mainly single storey residential and commercial of various types and ages reflecting steady development over the last 100 years. There are a small number of multi-storey office blocks and industrial buildings of strategic importance, and other buildings servicing infrastructure or of historical and cultural significance. Small residential homes will not be affected by this policy.

# **Policy Statement**

## **1. Identifying Earthquake Prone Buildings (EPBs)**

A survey was undertaken in 1999 to identify earthquake-prone buildings in the South Waikato District in terms of Sec 65 of the Building Act 1991. The survey identified 27 buildings in the Putaruru and Tirau townships and 13 buildings in Tokoroa that deserved more investigation. A consultant engineer was engaged to carry out a more in-depth assessment. A Rapid Evaluation Method developed by the New Zealand Society for Earthquake Engineering was used to classify the level of risk for each building. There were three buildings that displayed a significant level of risk and the owners were required to engage a qualified engineer to assess and report on whether measures should be taken to reduce the risk of danger in the event of a moderate earthquake. The risk assessments were recorded and are available in LIM reports for those properties.

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The Building Act 2004 has more stringent requirements than were required under the 1991 Act and as a consequence Council will review the previous assessment through the following process:

- Categorise and prioritise all buildings to which Section 131 of the Act applies according to their function:
  - Category 1: Buildings with special post-disaster functions as defined in AS/NZS 1170.0: 2002, Importance Level 4.
  - Category 2: Buildings that contain people in crowds or contents of high value to the community as defined in AS/NZS 1170.0: 2002, Importance Level 3.
  - Category 3: Buildings with a Heritage Classification of A or B under the Council's Heritage and Ecological Inventory.
  - Category 4: Buildings with an Importance Level less than 3 as defined in AS/NZS 1170.0:2002
- Carry out a desk top study of the buildings in the District to identify possible EPBs.
- Assemble a list of EPBs according to the results of the study.
- Broadly assess the performance of those buildings in relation to the new building Standard and, in particular, to the standard defined for EPBs.

## 2. Assessing EPBs

- 2.1 Buildings that have identified as possibly being EPBs as per section 1 above shall be further assessed by:
- Carrying out a brief building study, if appropriate in conjunction with the Building Warrant of Fitness site audit, to identify construction methods and condition as well as use of the building.
  - Establish a risk level for buildings, using the EPB Risk Matrix (Appendix 1), of Low, Moderate or High.
  - Carry out an initial evaluation of performance during an earthquake based on information obtained by using the New Zealand Society for Earthquake Engineering Initial Evaluation Method.
  - Advise Owners of buildings that are identified as being Earthquake-Prone.
  - Advise the Owner to obtain a detailed assessment of the building by an Engineer within the agreed timeframes.
- 2.2 Council will use the New Zealand Society for Earthquake Engineering Recommendations as its preferred basis for defining technical requirements and criteria. These Recommendations are designed to be used in conjunction with AS/NZS 1170 Loadings Standard, NZS 3101 Concrete Structures Standard, NZS 3404 Steel Structures Standard and other materials Standards.

## 3. Taking Action

Council will take action on EPBs according to the powers set out in section 124 of the Building Act 004.

### **3.1 Identified EPBs**

Council will:

- Advise and liaise with Owners of identified EPBs.
- Encourage Owners to carry out independent assessment of the structural performance of those buildings identified as earthquake-prone.
- Serve formal notices on Owners of EPBs in accordance with the Act requiring them to reduce or remove the danger within a time stated in the notice. (Not less than 10 days after the notice is given)
  
- Note that Owners may appeal the Council against the classification within 12 months of receipt of notice, which can include applying for a determination under section 177 of the Act.
- The timeframes for undertaking structural work shall be in general accordance with the following;
  - High Seismicity zone/ Low Risk ..... within 15 years
  - High Seismicity zone/ Moderate Risk ..... within 10 years
  - High Seismicity zone/ High Risk ..... within 5 years
  - Medium Seismicity zone/ Low Risk ..... within 20 years
  - Medium Seismicity zone/ Moderate Risk ..... within 15 years
  - Medium Seismicity zone/ High Risk ..... within 10 years

### **3.2 Interaction with Building Consent Applications**

#### **3.2.1 Alterations to Existing Building (Section 112 of the Act)**

Whenever a building consent application is received for significant upgrading or alteration of a building that is potentially earthquake-prone, then, irrespective of the general priorities set by Council for dealing with EPBs, Council will not issue a building consent unless it is satisfied that the building is not earthquake-prone and that the building work will not detrimentally affect the building's compliance with the Building Code. This will require the Owner of the building to engage a suitably qualified engineer to investigate and assess the structural integrity of the building. If the building is shown to be earthquake-prone, then Council will require that the building be strengthened to comply as nearly as reasonably practicable with the provisions of the Building Code prior to or as part of the building consent applied for. This approach is consistent with Section 112 of the Act.

#### **3.2.2 Change of Use (Section 115 of the Act)**

Whenever a building consent application is received for change of use of a building that is or could be earthquake-prone, then, irrespective of the general priorities set by Council for dealing with EPBs, it will be a requirement of the building consent that the Owner make a detailed assessment of the earthquake performance of the building to determine whether or not it is an EPB in its existing condition. If the building is shown to be earthquake-prone then Council will require that the building be strengthened to comply as nearly as reasonably practicable with every provision of the Building Code that relates to structural performance, as required by section 115(b)(i)(A) of the Act. (In this instance the requirement for EPBs would be the same as that for non-EPBs.)

### ***3.3 Dealing with Building Owners***

South Waikato District Council will endeavour to liaise with Owners prior to taking any action under the Act:

- Before exercising its powers under section 124, Council will seek, within a defined time-frame, to discuss options for action with Owners, with a view to obtaining from the Owner a mutually acceptable approach for dealing with the danger, leading to receipt of a formal proposal from Owners for remedial work. e.g. strengthening or removal.
- In the event that discussions do not yield a mutually acceptable approach and proposal, Council will serve a formal notice on the owner to strengthen or demolish the building.
- Notwithstanding the above provision, should the condition of a building be found dangerous or insanitary, Council may require more immediate action to be taken in accordance with Section 124 and Council's Policy on Dangerous and Insanitary buildings.

### ***3.4 Recording a Building's EPB Status***

Council will keep a register of all EPBs noting the status of requirements for improvement or the results of improvement as applicable.

In addition, the following information will be placed on the LIM for the property containing each earthquake-prone building:

- The address and legal description of land and building.
- A statement that the building is on the Council's register of EPBs
- The date by which strengthening or demolition is required (if known).
- A statement that further details are available from Council to those who can demonstrate a genuine interest in the property.

### ***3.5 Access to EPB Information***

Information concerning the earthquake-prone status of a building will be contained on the relevant LIM. In addition, Council will keep a record of the grade of all buildings that have been assessed, and will encourage all Owners of EPBs to have them assessed and graded.

Council will not require EPBs to have an identifying plaque. It is deemed that the information available at the Council offices is sufficient notice at present. In granting access to information concerning EPBs, the Council will conform to the requirements of the relevant legislation.

### ***3.6 Dealing with Heritage Buildings***

South Waikato District Council believes it is important that its heritage buildings have a high probability of surviving a major earthquake. However, Council does not wish to see the intrinsic heritage values of these buildings adversely affected by structural improvement measures.

Heritage buildings will be assessed in the same way as other potential EPBs. Discussions will then be held with Owners and the Historic Places Trust to identify a mutually acceptable way forward.

Special efforts will be made to meet heritage objectives. Council will provide advice during the structural review of these buildings and the identification of suitable means of

improvement. Following this consultation period, notices will be served requiring improvement or demolition within a stated (and preferably agreed) time-frame. In particularly important cases, public consultations will be included.

### ***3.7 Economic Impact of Policy***

After the initial identification phase of potential EPBs Council will carry out a broad assessment of the economic impact of this Policy and will take that into consideration in future reviews of the Policy.

## **Relevant Delegations**

Group Manager Environmental Development

## **References and Relevant Legislation**

Building Act 2004

Building Act 1991

Dangerous and Insanitary Buildings Policy 2006

NZ Society for Earthquake Engineering Bulletin: "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes".

NZS3604:1999 Timber Framed Buildings

## **Annotations**

<b>Res No</b>	<b>Date</b>	<b>Subject/Description</b>
307/06	22/06/06	Policy adopted

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**Appendix 1 – Building Risk Assessment – Earthquake-Prone Buildings**

Address.....

Lot No:..... DPS No:..... Building Consent No:.....

<b>Risk Factor</b>	<b>Rating (H/L)</b>	<b>Score</b>
<b>Users</b>		
1. What is the maximum number of users at any one any one time	100 + people (H) = 10 Less than 100 people (L) = 7	<input type="text"/>
2. What is the predominant age group of the building users?	Children or Infants (H) = 10 Adults (L) = 3	<input type="text"/>
3. What is the general capability of the building users?	Mentally handicapped/immobile (H) = 10 Physically handicapped but mobile (H) = Normal (L) = 3	<input type="text"/>
<b>Usage of the building</b>		
4. What is the sleeping activity rating for the building in terms of the building code?	SD, SA, SC, (H) = 10 SR (L) = 3	<input type="text"/>
5. Is the building used for any of the following activities? a. Education b. Old people's home c. Hospital (private or public) d. Residential institution e. Place of Assembly f. Hotels and motels g. Backpackers and Home stays h. Attached multi-unit buildings	Children (H) = 10 Adults (L) = 5 Geriatric (H) = 10 Mobile (L) = 5 Bedridden (H) = 10 Mobile (L) = 8 Bedridden (H) = 10 Mobile (L) = 5 >100 people (H) = 10 <100 (L) = 3 >20 people (H) = 7 <5 (L) = 3 >20 people (H) = 9 <5 (L) = 5 >5 apartments (H) = 7 3-5 (L) = 5	<input type="text"/>
6. What is the crowd, working, business or storage activity for the building in terms of the building code?	WD, WM, CL, CM (H) = 10 WL, CS (L) = 3	<input type="text"/>
<b>Building Characteristics</b>		
7. Does the building have common walls with others?	>1 (H) = 5 <1 (L) = 3	<input type="text"/>
8. How many storeys does the building have? 1 2 3 4 5 6 7 8 9 includes basements	2 = 5 add 5 for every subsequent storey	<input type="text"/>
9. Any historic clarification or significance?	Yes = 2	<input type="text"/>
10. Is the building in the inner city, in a known geothermal area or previous seismic activity?	Yes (H) = 10	<input type="text"/>
11. What is the age and condition of the building? e.g. Pre 1940 = 10 Pre 1965=8	Assian score 1-10 accordinaly	<input type="text"/>
12. Are there any other factors to be considered? e.g. Parapets, verandahs, attachments or adornments	Assian score 1-10 accordinaly	<input type="text"/>
<b>Total Score (out of approx 100)</b>		<input type="text"/>
<b>Note: &lt; 40 Low Risk 40-60 = Moderate Risk) &gt;60 = High Risk)</b>		