

MASTERTON DISTRICT COUNCIL

**EARTHQUAKE – PRONE
BUILDINGS POLICY**

2006

1. INTRODUCTION AND BACKGROUND

- 1.1 The Building Act 2004 requires territorial authorities to adopt a policy on earthquake prone buildings by 31st May 2006.
- 1.2 This policy is developed with due consideration of the ratepayers and stakeholders in accordance with section 83 of the Local Government Act 2002. The definition of an earthquake prone building is set out in the Building Act 2004 and in the related regulations that define a moderate earthquake.
- 1.3 This definition covers more buildings and requires a higher level of structural performance of buildings than that required of the Building Act 1991 and of the Local Government Act 1974.
- 1.4 This document sets out Council's policies relating to earthquake-prone buildings, specifies the priorities that will be adopted in carrying out those functions and how the policy applies to heritage buildings.
- 1.5 The purpose of this policy is in accordance with the general principles of the Building Act 2004 which is to ensure people who use buildings can do so safely and without endangering their health; and buildings have attributes that contribute appropriately to the health, physical independence, and well-being of the people who use them.

2. BUILDING ACT 2004 LEGISLATIVE REQUIREMENTS

- 2.1 Section 131 of the Act states that:

“(1) A territorial authority must, within 18 months after the commencement of this section, adopt a policy on dangerous, earthquake-prone, and insanitary buildings within its district.”

“(2) The policy must state -

- (a) the approach that the territorial authority will take in performing its functions under this Part; and*
- (b) the territorial authority's priorities in performing those functions; and*
- (c) how the policy will apply to heritage buildings.”*

- 2.2 Section 132 of the Act states that:

[“(1) A policy under section 131 must be adopted in accordance with the special consultative procedure in section 83 of the Local Government Act 2002.”

- “(2) *A policy may be amended or replaced only in accordance with the special consultative procedure, and this section applies to that amendment or replacement.*”
- “(3) *A territorial authority must, as soon as practicable after adopting or amending a policy, provide a copy of the policy to the chief executive.*”
- “(4) *A territorial authority must complete a review of a policy within 5 years after the policy is adopted and then at intervals of not more than 5 years.*”
- “(5) *A policy does not cease to have effect because it is due for review or being reviewed.*”]

2.3 Under section 122 of the Act an earthquake-prone building is defined as:

- “(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.*”

2.4 With regard to what constitutes a “moderate” earthquake the Building (Specified Systems, Change the Use and Earthquake-Prone Buildings) Regulations 2005 defines it as *“an earthquake that would generate shaking at the site of the building that is of 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 that site.”*

3. MASTERTON DISTRICT FAULTS

Seismicity

- 3.1 The Masterton District contains 3 main fault traces within and around the town of Masterton. These are the Wairarapa, Mokonui and Masterton faults. The rural areas of the district contain various major (eg Carterton fault) and minor fault traces in various areas.
- 3.2 The Wairarapa Fault runs north east from the Waingawa River at Burnetts Road to 2.5 kilometres south of Mauriceville along Opaki Kaipororo Road. This fault includes various side traces.

- 3.3 The Mokonui Fault runs north east from the Waingawa River 1.5 kilometres north of Skeets Road to 1.6 kilometres east of its intersection with James Road. This fault contains splinters that head north around the intersection of Opaki Kaipororo Road and State Highway 2 to an estimated 3.6 kilometres south of Mauriceville parallel with the Wairarapa Fault.
- 3.4 The Masterton Fault runs east from the Waingawa River at the rail bridge to 350 metres north along Chapel Street from the intersection of Cornwall and Chapel Streets. It is then projected that the fault continues east through the town crossing Te Ore Ore Road 150 metres east of Colombo Road intersection and continuing across the Ruamahunga River to the south of the Te Ore Ore Hill.
- 3.5 With these major faults being close to the town of Masterton, it would be reasonable to estimate that the town would experience considerable shaking in the event of a major earthquake centred along one of the faults.
- 3.6 There have been two significant earthquakes in Masterton that caused severe damage, 1934 and 1942. After the 1934 earthquake many of the damaged buildings were rebuilt in brick and incorporated some concrete to tie parapets, etc, together. The legacy of the 1942 earthquake which caused the most damage to the town's buildings can still be seen today. Old photographs of the town centre show heavy ornate facaded two storied brick buildings, which after the earthquake were reduced to single storied buildings with roof gable ends converted to hips and timber, iron or sheet material used for street parapets.
- 3.7 Future strong earthquakes along any of the above faults could cause strong ground shaking that could cause buildings to collapse, crack and disintegrate.

4. IDENTIFYING EARTHQUAKE-PRONE BUILDINGS

4.1 Background

- 4.1.1 Previous legislation, starting with the Municipal Corporations Act 1968, followed by the Local Government Act 1974 and then subsequently by the Building Act 1991 defined earthquake risk buildings as structures comprised wholly or substantially of unreinforced concrete or unreinforced masonry and unable to withstand the loads imposed by 50% of the loading specified in Chapter 8 of NZSS1900:1965 – the 1965 design code.
- 4.1.2 The Masterton District Council used the former legislation to classify a number of buildings within its jurisdiction. These buildings were given a timeframe within which they were to be removed from the list, either by securing then strengthening, or by removing the danger.
- 4.1.3 As pointed out above the new definition of earthquake-prone buildings sets out to classify buildings built to the 1965 design code before the mid

1970's. The current New Zealand Structural Design and Loading Code, NZS4203, was first introduced in 1976. It is considered that this is the beginning of the modern earthquake resistant design era whereby the catastrophic collapse of buildings is specifically guarded against via a design hierarchy of collapse. NZS4203:1992 has been superseded in part by AS/NZS1170.0:2002 which is soon to be referenced in the NZ Building Code. AS/NZS1170.0:2002 is classed as the current code where referenced in this policy.

4.2 Buildings that will be assessed and the basis for deciding what buildings will be assessed

4.2.1 While theoretically all buildings in the town [excluding buildings listed in section 122(2) of the Building Act 2004] will have to be assessed. Council will adopt the following approach in assessing and identifying buildings.

4.2.2 Previously assessed un-reinforced masonry or un-reinforced concrete buildings:

In 1988 council assessed and identified a group of buildings within the town CBD area that were classed as earthquake prone buildings under the requirements of section 624 of the Local Government Act 1974. Council considers that this assessment and identification carried out and adopted is accurate. However, Council will review the current list of buildings to determine whether any buildings should be added or deleted.

4.2.3 All other buildings:

For all other buildings Council will carry out an initial drive-by and desktop study using information from building permits and building files. Following this initial desktop study Council will carry out inspections of individual buildings where this is deemed to be necessary.

4.3 Matters that will be taken into account when assessing buildings

4.3.1 All buildings will be assessed based on information obtained by using the NZSEE Initial Evaluation Method process.

4.3.2 For practical purposes earthquake prone buildings will be defined as those that, when subject to moderate earthquake shaking, do not meet or exceed the criteria for ultimate limit state as defined in the loadings and materials standards for new buildings.

4.3.3 The NZSEE recommendations will be used as the preferred basis for defining technical requirements and criteria. These recommendations are designed to be used in conjunction with AS/NZS 1170 Loadings Standard, NZS3101 Concrete Structures Standard, NZS 3404 Steel Structures Standard and other materials standards.

4.4 Timeframe for assessing the buildings

4.4.1 Council will carry out the required assessment to identify buildings within six months of the policy being adopted by Council.

4.5 Taking action on earthquake-prone buildings

4.5.1 Once Council has identified earthquake-prone buildings it will:

- (i) advise and liaise with owners of buildings identified as earthquake-prone.
- (ii) encourage owners to carry out an independent assessment of the structural performance of those buildings identified as earthquake-prone and give them six months to carry out such investigations.
- (iii) review the assessments carried out by the owners and revise the list of classified buildings as necessary.
- (iv) serve formal notice on owners of earthquake-prone buildings in accordance with section 124 of the Building Act 2004 to remove the danger. A timeframe as laid out in this policy will be set for the owner to complete the work required to make the building compliant.
- (v) allow owners to make submissions against the classification within six months of receiving the notice.
- (vi) hold a hearing to consider the submissions raised by owners and then issue decisions.

5. LEVEL OF STRENGTHENING TO BE ACHIEVED AND TIMEFRAME

5.1 General

5.1.1 The Act is silent upon the level to which a classifiable building needs to be strengthened in order to have its designation removed. Thus, in theory, the level could be 'just above' the trigger level as defined in the Building (Specified Systems, Change the Use and Earthquake-Prone Buildings) Regulations 2005, listed above.

5.1.2 In considering what level above the trigger level should be adopted consideration needs to be given to buildings previously identified and strengthened under the previous legislation and requirements to heritage buildings.

5.2 Previously strengthened buildings

5.2.1 Buildings previously defined as earthquake-prone buildings and which have the required strengthening work completed to the former legislation represent a special class. They, by definition, are of unreinforced concrete or unreinforced masonry. Strengthening is most likely to have been via the installation of a structural steel frame or structural steel bracing. Many of these buildings also needed strengthening on one

direction because they contain long brick shear walls along their side boundary but had open frames along their street elevation.

5.2.2 Although the design level to which these buildings have been strengthened (often only at just above 2/3 the strength specified in the 1965 Code), is slightly less than the new trigger level. The structural steel of their strengthening members may have reserve capacity to accommodate the slight imbalance.

5.2.3 Consequently it is Council's policy that these buildings not be reclassified. Natural justice would imply it is unfair to doubly penalise such structures by now requiring further strengthening, as such a process inadvertently suggests these buildings should previously have been demolished rather than strengthened. Such an emphasis is also contrary to the policy of heritage promotion and would imply to owners of buildings now being classified that they should pursue demolition rather than strengthening (see policy below relating to heritage buildings).

5.3 Heritage buildings

5.3.1 The Act directs Council to pay special attention to heritage buildings. Council also through its District Plan has adopted a policy whereby resource consent is required for the alteration, demolition or relocation of listed heritage buildings.

5.3.2 Council considers that heritage buildings have public good benefits as they provide aesthetic enjoyment and benefits for the community and contribute significantly to the amenity values of the town. As there are only a limited number of heritage buildings in the town as compared to the overall stock of buildings and given the irreversibility of demolition, it is considered that the benefits of preservation of heritage buildings are substantial, compared to redevelopment benefits.

5.3.3 Most of the heritage buildings identified as earthquake-prone have already been through the earthquake risk classification. The brick buildings are likely to have already been strengthened to some degree while those of concrete construction are unlikely to be more than two storeys. The concrete buildings are also highly likely to contain concrete shear walls as part of their structural system, which would generally mean they can pass the classification threshold.

5.3.4 Taking the above into account, it is Council's policy that no further work is required for heritage buildings that have already been strengthened.

5.3.5 With regard to heritage buildings already classified and found to be in need of strengthening, but where strengthening has not yet been undertaken:

- (i). Those heritage buildings whose timeframes have already expired without being strengthened, or have expiry periods of less than two years to run, be given a deadline of two years from the date the policy is adopted.

- (ii). Longer timeframes up of to 10 years are retained for buildings previously specified but still have more than 2 years to run.

5.3.6 For heritage buildings not previously strengthened and not previously classified it is considered that they should be strengthened to a level just above the trigger level. For these buildings a period of ten years from the time the policy is adopted by Council is imposed.

5.4 All other identified buildings

5.4.1 This category relates to non-heritage buildings to be identified in the proposed review as well as non-heritage buildings previously identified but not yet strengthened. In the absence of any national guidance relating as to what level buildings should be strengthened, the council will adopt a level of strengthening between 67% of the current code as recommended by the NZSEE and 33% of the current code as the trigger level for defining an earthquake-prone building by the Building Act 2004.

5.4.2 The council will adopt a level of 50% of the current code. For these buildings a time frame of a maximum of up to ten years is adopted depending on the current structural condition of the building.

5.5 Change of use, alteration, extension of life or subdivision of buildings

5.5.1 Where a change of use, alteration, extension of life or subdivision is proposed in an earthquake-prone building, Council may require the earthquake strengthening work to be carried out at the same time. In determining this matter Council will take into account the extent of the work proposed to ensure compliance with the Building Code and the cost involved.

5.6 Recording a building's earthquake-prone status

5.6.1 Council will keep a register of all earthquake-prone buildings noting the status of requirements for improvements or the results of improvements as applicable.

5.6.2 In addition, the following information will be placed on the LIM and PIM of each earthquake-prone building:

- (i) address and legal description of land and building;
- (ii) statement that the building is on the Council's register of earthquake-prone buildings; and
- (iii) date by which strengthening is required.